

Montana – Alberta: St Mary & Milk Rivers Water Management Initiative

**Joint Initiative Team Meeting #10, Ramada Hotel
December 3-4, 2009, Lethbridge, Alberta**

Montana	Alberta
Anne Yates – DNRC (co-Chair)	Robert Harrison – Alberta Env't (co-Chair)
Dustin de Yong – Office of the Lt. Governor	Brent Paterson – AB Agriculture & Rural Dev.
Randy Reed – Milk River irrigator	Ken Miller – Milk River
Dave Peterson – City of Havre	Tom Gilchrist – Milk River
Harold "Jiggs" Main – Ft. Belknap Tribe	Gerry Perry – Oldman River
Paul Azevedo – DNRC (secretariat)	Duncan Lloyd – Oldman River
Don Wilson – Blackfeet Tribe (day 1 only)	Tim Toth – AB Environment (secretariat)
Larry Dolan – DNRC Technical Team	Sal Figliuzzi – Alberta Env't Tech. Team

Observers – Roger Hohm – AB Agriculture & Rural Development, John Sanders (DNRC - St. Mary Canal rehabilitation engineer), Laurent Conard (AENV modeller, Dec. 3)

Purpose of Phase 2 Joint Initiative Team

To explore and evaluate options for improving both Montana's and Alberta's access to the shared water of the St. Mary and Milk Rivers, and to make joint recommendation(s) on preferred options to both governments for their consideration and approval.

Meeting Objective(s)

- Understand implications of completed runs and get closure on all model run results
- Finalize process for evaluating model Options
- Start to identify runs that can be eliminated from further evaluation

Notes

Day 1 – Dec. 3 – 8:30 a.m. – 5:00 p.m. Scenic Room

1. Welcome; Administration – Robert; Anne; Tim, Paul

Robert welcomed the Team.

Paul advised that he was unable to complete the Notes from meeting #9 (October 28-29), but will do so soon. Paul reviewed Action items from JIT meeting no.9 – Actions #1-5 and #14-16 are complete or being addressed today; Action #6 – Prepare an update on the Initiative for the IJC's international records meeting in Feb. 2010, is incomplete; Actions #7-10 are addressed through Sal and Larry's presentation today; Action #13 - Communications between U.S. and Canada on request for compensation for use of the Milk R. channel — Sal is compiling the history of communications and will have them ready for the next meeting.

[1] ACTION: Sal to complete compiling communications between the U.S. and Canada about the request for compensation for use of the Milk R. channel to convey U.S. St. Mary R. diversion water.

Tim reported that the Technical Background Report is complete and provided paper and digital copy to MT.

[2] **ACTION:** Secretariat to compile a list of parties interested in the Technical Background Report and provide them copies.

Communications

Montana – are meeting with their constituents on the Highline and representatives in the U.S. Bureau of Reclamation next week; are briefing the Governor’s office in a series of three meetings (the first meeting is complete); has invited Tribal Council leadership to meet.

Alberta – briefed their executive (Assistant Deputy Ministers of Agriculture, and of Environment), who have supported continuing to explore all options; met with the leadership of the Agriculture Irrigation Projects Association (AIPA) (4 irrigation districts, 21 members); the Press attended and reported on the initiative. The presentation to AIPA is on Environment’s SharePoint site. Robert and Brent briefed Broyce Jacobs, MLA for Cardston-Taber-Warner, and the Alberta government official responsible for this file.

[3] **ACTION:** Alberta to send Montana a copy of the Terms of Reference developed for the Milk River, AB integrated watershed management plan study.

Agenda items 2 and 3 are supported by Sal and Larry’s PowerPoint presentations.

2. Modelling activity since October meeting – Larry Dolan and Sal Figliuzzi

Larry and Sal presented the modelling activity completed since last meeting and described the differences in the various runs. They answered questions from the Joint Team to clarify details. Decisions made by the co-Chairs on the model runs since meeting #9 were discussed.

The implications of securing a water supply to support the existing 8000 ac. in the AB Milk R. basin were discussed. Larry noted that there were still some runs to be completed. Additional description of the runs is contained in the presentation.

[4] **ACTION:** The Technical Team will model the impacts of securing a water supply for the existing 8000 ac. in the AB Milk R. basin. This will be comparable to existing runs #19 and #20.

3. Review remaining model runs – Larry and Sal

Larry and Sal reviewed the options modelled since last meeting. The Joint Team questioned the relationship between increased flows in the Milk R. and the potential for erosion. That component has not been analyzed. Summary information below is taken from the presentation slides.

Changing balancing periods

Extending the balancing period to repay deficits allows jurisdictions access to a larger portion of their entitlement share. This creates a credit for a jurisdiction for water that crosses the boundary into the other jurisdiction during the non-irrigation season and when flows are higher than can be diverted, and then allows that jurisdiction to draw on that credit later in the season.

Longer balancing period –

Montana findings – summary

- MT would have access to about 88% of its share on average under seasonal, and about 92% on average under an annual balancing period
- Longer balancing periods would provide additional water to MT irrigators, especially under the annual balancing period where, during the driest years, the U.S. would have access to 98% of its share, an additional 10,000 - 16,000 ac.ft might be provided
- Alberta's access to water for its Milk R. irrigators would increase with longer balancing periods too; this needs to be considered when assessing overall benefits to MT

Alberta findings – summary

- AB Milk R. irrigators would have access to a larger percentage of their Milk R. share under seasonal and annual balancing periods
- Access to all flow on the Milk R. (natural flow and U.S. diversions) under annual balancing would substantially increase AB's access to its share and allow irrigation expansion to 9500 acres, while still meeting AB irrigation failure criteria
- In the St. Mary basin, annual balancing would give the U.S. greater access to its share of St. Mary R. and reduce the St. Mary flow into AB by 28,000 ac.ft. on average, and by 10,000 ac.ft. during dry years
- An annual balancing period would increase the number of deficits greater than 4" from 1 to 2-3 events in the Raymond ID

Model runs for Lower St. Mary Lake storage and increased Fresno Reservoir storage under longer balancing periods have yet to be completed and analyzed. The trade-off between additional storage on Lower St. Mary Lake vs. increasing the balancing period has to be analyzed.

Alberta Participation in U.S. St. Mary Canal Rehabilitation with Canadian St. Mary River Water

Montana key findings –

- AB participation in the U.S. St. Mary Canal rehabilitation and corresponding development of 5000 - 10,000 additional acres of Alberta Milk R. irrigation would have a small effect on water deliveries to U.S. Milk R. irrigators – if AB used Canadian St. Mary R. water as supplemental supply, about 2000 ac.ft. less (on average) would be delivered to the U.S. during the driest years
- Reductions to the water supply for U.S. irrigators would be more substantial without the Letter of Intent

Alberta key findings – Milk R. basin

- To irrigate 13,000 – 18,000 acres in Albert Milk R. basin to AB standards would require an average diversion of about 9000 – 17,000 ac.ft. of Canadian St. Mary entitlements and over 25,000 ac.ft. during dry years

Alberta key findings – St. Mary R. basin

- While irrigating 13,000 – 18,000 acres in the Milk R. basin would require an average of 9000 – 17,000 ac.ft. of Canadian St. Mary entitlements, St. Mary Project diversions would be reduced by up to 6000 ac.ft.
- The diversion of Canadian St. Mary entitlements to irrigate 13,000 – 18,000 acres in the Milk basin would cause irrigation shortfalls >4" to increase from 2 to 4 occurrences in the Raymond ID and to increase from 1 to 2 or 3 occurrences in the Magrath ID

Alberta Participation in U.S. St. Mary Canal Rehabilitation with U.S. St. Mary R. Water

Montana key findings –

- AB participation in U.S. St. Mary canal rehabilitation with development of an additional 5000 – 10,000 acres of new Milk R. irrigation using U.S. share of St. Mary R. water would reduce water deliveries to U.S. irrigators by 7000 – 11,000 ac.ft. on average, and by 24,000 – 35,000 ac.ft. during the driest years
- Without the Letter of Intent, these reductions would be increased by another 4000 – 5000 ac.ft. per year

Alberta key findings – Milk R. basin

- To irrigate 13,000 – 18,000 acres in AB Milk R. basin to AB standards would require an average diversion of about 9000 – 17,000 ac.ft. of U.S. St. Mary entitlements and over 25,000 ac.ft. during dry years

Alberta key findings – St. Mary R. basin

- Because it is U.S. water that Canadian Milk R. irrigators access, St. Mary Project diversions would remain relatively constant
- The diversion of U.S. St. Mary entitlements to irrigate 13,000 – 18,000 acres in the Canadian Milk basin would have no impact on irrigation failures in the Canadian St. Mary Projects, however, applying the current LOI over this option would cause irrigation shortfalls >4” to increase from 2 to between 2-4 occurrences in the Raymond ID and remain unchanged in the Magrath ID

Maximum Water Supply and Increased Efficiency Options

Maximum Water Supply Option

Montana key findings –

- MT irrigation shortages would decrease from about 14 years with shortages > 4” in 45 years, to 2-3 years of 4” or greater shortages
- MT irrigated lands could increase by about 41,000 acres to a total of about 178,000 acres and still meet the AB irrigation standard
- MT total irrigation deliveries would decrease by about 110,000 ac.ft. (*i.e.*, less return flows)
- AB total Milk R. irrigation would increase by about 19,000 to 27,000 acres total

Alberta key findings –

- These options involve primarily improvements to Montana’s internal water delivery systems and as such would have no effect on the Canadian Milk River Irrigation or on the quantity of St Mary River flows accessed by Canada.
- Options 21b and 21c, which include the implementation of a 227,000 ac-ft reservoir on the Canadian Milk River, would increase Alberta Milk River Irrigation by about 19,000 acres to 27,000 acres.

Montana Irrigation Efficiency Option

Montana key findings –

- MT years of 4-inch or greater shortages would decrease from about 14 out of 45 years to about 5 out of 45 years
- MT total irrigated acres might be increased by about 5000 acres to a total of about 146,000 acres
- MT total irrigation deliveries would decrease by about 115,000 ac.ft. (*i.e.*, less return flows)

Modified 1921 Order

There was discussion about what the impact could be of modifying the 1921 Order so that during the non-irrigation season (Nov.1–March 31), flows are still divided 50-50 on both rivers. During the irrigation season (April 1 – October 31):

- For flows <666 cfs, 75% goes to Canada on the St.Mary R. and 75% to the U.S. on the Milk R.
- For flows between 666 cfs and 1332 cfs, 75% goes to U.S. on St. Mary R. and 75% to Canada on the Milk R.
- Flows above 1332 cfs are divided evenly on each river

In high-flow years, unless water can be stored, U.S. St. Mary canal capacity becomes a bottleneck and limits what can be delivered.

Montana key findings –

- MT would have access to about 32,000 ac.ft. more St. Mary R. water on average
- MT's share of Milk R. water would be reduced by an average of 3200 ac.ft.
- On average, MT would receive about 49% of the combined natural flows of the St. Mary R. at the international boundary and the Milk R. at the eastern crossing
- MT Milk R. irrigators would benefit most during driest years when deliveries might increase by about 30,000 ac.ft.

Alberta key findings –

- Alberta Milk R. basin would be entitled to about an additional 3200 ac.ft.
- AB's access to its share of the Milk R. and its irrigation success would not change from that without the modification to the Order
- Canadian St. Mary entitlements would be reduced by about 32,000 ac.ft.
- Canadian access to St. Mary entitlements would be reduced on average by about 10,000 – 50,000 ac.ft. depending on the U.S. infrastructure and by 20,000 – 30,000 ac.ft for dry years
- Irrigation shortfalls >4" would increase from about 1-2 to between 3-4 occurrences in the Raymond ID; from 1 to between 2-3 in Magrath ID, and from 1 to 2 in the Taber ID

Additional detail is contained in Sal and Larry's presentation.

Comparison of runs against a consistent base

The Technical Team's understanding of the system and of the model increased during its work. Comparisons of news runs against the original base case (a 650 cfs canal, current conditions and infrastructure) were the first comparisons made. As option requests became more involved, comparisons against a different 'base case' were sometimes made to expose other differences (*e.g.*, discovered a different way to operate Sherburne reservoir to provide more water).

The Joint Team requested the Technical Team to clarify when comparisons among options were made against a different base than option #1a.

Diversion rates – discussion

During dry years, Canada would require about 125 cfs capacity in the U.S. St. Mary canal to get water into the Canadian Milk R. basin. In 2009, the following diversion rates were used by Canada to repay its LOI on the Milk R.:

- AENV licenses specify maximum flow of 105 cfs
- Maximum rate diverted in 2009 = 39.7 cfs (U.S. 17,000 gal./min.)
- Average diversion rate 2009 = 17 cfs

4. Recap model results – Larry, Sal, Robert, Anne — Moved to morning of day 2.

5. Option evaluation criteria – Robert and Larry

Robert gave an overview of the option evaluation criteria and how to apply the two categories, referring to meeting handout, “MT-AB Water Management Initiative – Suggested Evaluation Criteria.” Category A has two numerical components to calculate – (1) the percent entitlement and volume of water accessed, and (2) irrigation reliability. Category B is a non-numeric professional judgment to assess other aspects of importance to the jurisdictions, such as impact on security of municipal water supplies, water quality, rate of sediment deposition/erosion, recreation, *etc.*

Category A: Criterion 1: Wording changes were made to clarify ‘percent of share and volume to which each jurisdiction has access. Entitlement is based on the 1921 Order. Criteria for success are for a jurisdiction to get at 100% of its share, not, for example, “10% more”.

Criterion 2: AB has a single criterion: the number of years with crop-water requirement shortages of over 4”. AB’s target is, on average, one deficit in 10 years.

: MT will use dual criteria which take into account the size of its districts and the fact that all the districts share the same priority date: (1) weighted average irrigation deficit for the option for the 1959-2003 period, and (2) weighted average number of years of ≥ 4 ” deficits.

Irrigation failure criteria – reporting and calculating

The Joint Team discussed how failure criteria should be reported. Each jurisdiction uses criteria appropriate to it – water not taken for irrigation has other uses (municipal, recreation, wildlife, *etc.*). The model calculates very small differences in the average aggregated deficit (10ths of an inch), so results must carefully reviewed to determine if the magnitude of the difference is real or within model error.

Category B Criteria –

AB requested and the Joint Team **agreed** to add the following: “Criterion 12. Does the option increase or decrease the amount of habitat available?”

The Team needs confidence in the evaluation criteria to screen the number of runs from 70 to 5–10. At that point, the Team will look at the Category B criteria re: potential broader impact on water management in each jurisdiction, and make a more holistic judgement on the option’s value to go forward as a potential recommendation.

Robert advised that, in preparing for creating the recommendations document, the Joint Team should discuss what decisions would be made by politicians, by the governments and by the Joint Team.

6. Update on First Nations water rights – Don Wilson, Jiggs Main

Don spoke to members about the Blackfoot Nation’s perspective of water resources on the Blackfoot Reservation. He also provided an update on the status of their Compact settlement with the federal government. Jiggs updated members on the status of Ft Belknap Indian Communities Compact settlement.

7. Discuss final document – Anne, Robert — Moved to day 2.

8. Framework for international watershed group – Robert

Robert gave an overview on what an international watershed board could be like, referring to meeting handout “St. Mary – Milk Rivers International Watershed Board – Thoughts for Discussion”. He suggested that the *authority* should be held by AB and MT, unlike other international IJC groups. He identified the *organizational structure* relationship to the IJC, suggested membership, and what kind of relationship members would have among themselves (reporting, information flow, *etc.*). The *Duties* section identifies what the suggested members could be responsible for.

[5] **ACTION:** The Joint Team is to review the draft Framework for an International Watershed Board and provide comments to the Secretariat. **DUE:** January 7, 2010

Day 2 – Dec. 4 – 8:10 a.m. – 2:10 p.m. Scenic Room

9. Recap of model learnings – Larry and Sal, and item #10:

10. Summary of model runs to date – Robert

Larry and Sal reviewed the main messages from all runs (by category) completed to date. Also handed out was an Options Summary Sheets package – the 70 model runs, one per page, with the results of each run compared against a 650 cfs canal and current (2009) infrastructure. Robert noted the link between data in the package of summary option runs and data in the presentation slides.

Questions/comments:

- Ft. Belknap has a right up to 645 cfs of U.S. entitlements on the Milk R. under the terms of their Compact settlement with the State of MT.
- What becomes of the erosion issue in the Milk R.?
- AB Milk R. irrigators live with a higher risk to irrigate their current 8000 acres (36 failures in 45 years without the LOI providing 4000 ac.ft. of water) at the AB standard. Without the LOI, about 2000-3000 acres can be reliably irrigated in the Milk R. basin at the AB standard. With the current LOI, Milk R. users risk about 21 failures in 45 years.
- With current U.S. operations and infrastructure, there is no impact on water users in the Southern Tributaries. An increase in the LOI would result in an increased number of failures in the Raymond I.D. (from 1 to 2) without any noticeable change in total diversion within the Southern Tributaries. Gerry asked why there was a change in failures without a change in diversions.

[6] **ACTION:** The AB Technical Team will determine why increasing the LOI increases the number of failures in the Raymond I.D., but does not noticeably change the total diversion in the Southern Tributaries.

- Both the Lower St. Mary L. storage and the LOI are valuable: Lower St. Mary L. captures some non-irrigation season flows that the LOI can't, and the LOI allows the U.S. to take some early spring Canadian water at a time when U.S entitlements are less than canal capacity and releases cannot be made from Sherburne L.
- Annual (water-year: Nov.1 – Oct.31) balancing would require active water management /monitoring and projections of water availability to year-end. This would be necessary to ensure the U.S. limits its deficit to a level that can be repaid later in the season, and similarly, that AB Milk R. irrigators limit their diversions to the balance owed. Annual balancing would still require the countries to balance out deficits at year-end. This forecasting and close

management by an on-the-ground MT and AB team would be a new way to manage the system.

- Moving to a calendar year (Jan.1- Dec.31) balance period does not lessen the risk. Moving to a calendar year does not allow Canada or the U.S. to take full advantage of prior knowledge of the surplus deliveries that will occur during the non-irrigation season (*i.e.*, surplus deliveries during Nov.1-Dec.31).
- The Team discussed giving a jurisdiction a credit for water that flows across the border in the non-irrigation season, and then being able to draw against that credit later (in the irrigation season). It was noted that, since reservoir operators manage their reservoirs with a flood-safety margin, water may not always be captured in the non-irrigation season.

[7] **ACTION:** Montana will develop criterion for success for Evaluation Criteria #2.

[8] **ACTION:** The Technical Team will redo the modelling of Option #22 (Storage on Ft. Belknap) for next meeting.

[9] **ACTION:** The Technical Team will convert data on slide #78 from dam³ to acre-feet, and produce a Summary Option sheet #23 math that is the mathematical calculation of theoretical shares based on the Modified 1921 Order.

[10] **ACTION:** The Technical Team will write-up why the original options #16a, #16b were not produced.

[11] **ACTION:** MT will discuss with the USBR whether it is possible to raise the elevation of Fresno Reservoir to hold 137,000 ac-ft. (refer to option #18a).

[12] **ACTION:** The Technical Team will model a new option #23e – what is the impact of Canada receiving only its share when the U.S. takes it full share?

[13] **ACTION:** The Technical Team will ensure all future model runs are compared a consistent base case.

[14] **ACTION:** Alberta will report back to JIT on whether the Province's irrigation criteria applies at the canal diversion, field headgate, or the crop.

The Joint Team discussed two other options that could/should be evaluated: changing irrigation efficiencies (which would make a difference in results), and a potential second 120,000 ac.ft. reservoir upstream of the existing St. Mary Reservoir.

[15] **ACTION:** Duncan Lloyd will acquire the report about a potential 120,000 ac.ft. reservoir upstream of the existing St. Mary Reservoir and provide it to the Secretariat.

11. Initial culling of Options – Robert and Anne

The Joint Team discussed and **agreed** to remove some options from further consideration because the option: 1) provided minimal benefit to either jurisdiction, 2) was purely theoretical, and/or in the best professional judgement of JIT members had little chance of being implemented. JIT members **agreed** to cull the following options:

- #1b (unlimited ID canal capacity) – a theoretical option
- #2b (unlimited ID canal capacity) – a theoretical option
- #3 (1200 cfs canal) – appears to provide minimal additional benefits
- #5 series (10,000 ac.ft. Sherburne L.) – very unlikely to be implemented and appears to provide minimal additional benefits
- #6 series (10,000 ac.ft. Sherburne L.) – very unlikely to be implemented and appears to provide minimal additional benefits

- #9 (large Babb dam) - a theoretical option
- #12a, #12b (1200 cfs canal with LOI) – appears to provide minimal additional benefits
- #14 series (10,000 ac.ft. Sherburne L.) – very unlikely to be implemented and appears to provide minimal additional benefits
- #15 series (10,000 ac.ft. Sherburne L.) – very unlikely to be implemented and appears to provide minimal additional benefits
- #16a and #16 c (seasonal balancing) – subject to confirmation with USBR
- #21a, #21b, #21c (maximum water supply options) - theoretical options

Additional discussion included:

- the #17 series appears to have minimal benefit to MT in increasing its share, but may be of benefit to the Blackfeet Nation so will be retained
- Option #18b (storing MT water in Canadian St. Mary Reservoir) will be retained for AB's internal discussion
- AB Team preferred to keep the #20 series, because of their interest in discussing it further. MT indicated it was very unlikely to be implemented
- Options #21d, #21e will be kept for long-range planning and reference
- the 650 cfs (including option #4c) should be kept and ranked by the larger group, to compare its value against other options.
- AB Team requested that #23 series be removed. MT requested that the option be retained for further internal discussion.
- AB Team requested the larger LOI options (#10b, #11b, #13b) be removed. MT requested that the options be retained for further discussion under an adaptive management strategy.

There was a question about which Sherburne L. filling curve should be used, the original vs. the modified filling curve.

[16] ACTION: The MT Team will recommend which Sherburne filling curve should be used for future model runs.

A larger LOI option was discussed – although a 20,000/10,000 LOI on its own may not be a potential option, a future joint international watershed group could explore other potential changes to a future LOI. This work may included: two alternatives –

- (1) Finding the LOI value that maximises the benefits to both jurisdictions and
- (2) Developing a LOI with flexible terms that adjust according to the amount of water available in any given year.

12. Meeting review and plan for next meeting – Robert and Anne

Robert and Anne thanked the Joint Team for making good progress during the meeting.

The next meetings are confirmed as follows:

Jan. 14-15th, 2010 – Great Falls

Feb 23-24th – Lethbridge

Start and end times will remain as they are.

The meeting was adjourned at 1:45 p.m.