

## NSRWRC Stakeholder Meetings – September 12, 2007

Alcurve Hall (Lloydminster)

### *Project History (Bob Collier)*

A brief outline by Chairman of Prairie Pine REDA and member of the board.

This all started in 2004 when the Economic Development officer of the City of North Battleford dusted off an old PFRA report from 1971. During the summer of 2005 there were a series of meetings to measure interest in a study looking at water management options. The steering committee was selected and in March 04 – 05 proceeded to get the incorporation of the committee registered Federally. In March 2005 the 1<sup>st</sup> annual meeting was held and the Executive Board was elected. The Board submitted an application for funding to the CanSask Water Committee and in June 2006 received confirmation of the funds. The Board was required to get 10% of the funding from local sources and the fundraising for this began and was completed thanks to support from local municipalities, businesses and so on. In December 2006, the consulting contract was awarded to Golder Associates. The consultants began with 3 public meetings in February 2007 and the results of Phase 1 of the project is what you are here to see tonight.

I would like to also provide you information about the Vision and Mission of the Committee:

Vision: to optimize the socio-economic opportunities from the water resources on the river

Mission: to explore research feasibility of sustainable multi-use water development along the river

### *Presentation by Golder Assoc.*

#### *Results of Question and Answer Period*

*How does the size of this dam compare to the Diefenbaker dam?*

This would be a large dam, but not as big as Diefenbaker

*Will water back up enough to secure the Lloydminster intake?*

The reservoir would flood back into the area of the intake. Depending on the design of the intake that may need to be changed.

*How high will the water rise at the border and will there be ways for people to know how high the water would be near where they live.*

At the border water elevation would be about 505m to 515m. The water would have between 1 and 11m additional height at the border. The full supply level of the dam is at 515 m and the 10m draw down would be 505m, so if you can figure out your elevation you can compare it to those figures (Imperial values are 1690ft and 1660ft)

*So the water could fluctuate 30 feet at the Meridian bridge?*

Yes, we needed some range to develop the hydropower strategy. For that work, we, assumed 10m of drawdown while generating electricity, below that limit it would not generate electricity.

*Has the Saskatchewan river ever quit running?*

No. In the event of a dam, there would always be releases so that water would continue to flow downstream. We have assumed that the dam would always release average flows downstream unless it got very low in which case, that might be reduced by 50%, but in times of very high flows, those would continue downstream

*What input would Alberta people have regarding the dam development as the impact crosses the border?*

For any water supply project, because it is an inter-provincial process, the assessment needs to include the impact of water use in one province on another province. For a large scale project the study would include both Saskatchewan and Alberta.

*How would the compensation for land that was flooded be evaluated?*

In the cost analysis assumed that market values would be paid to cultivated land and slightly less for bush land. This was \$1700/acre for cultivated and \$800/acre for non-cultivated.

*What about native grasslands?*

Crown land and native areas would have to be dealt with separately. PFRA in their old study had some values attached and we looked at those and applied inflation. If this proceeded, it would need to be negotiated and more accurately valued, but we needed a value for this comparison.

*Who came up with the land price evaluation?*

The \$1700 was an estimate. Based on existing data – our socio-economist takes land values, combined with inflation, job estimates, etc and applies that to estimate land values.

*For the cost/benefit analysis how long a time period was included? Would there be benefits that would last further than the time period that you considered?*

We assumed that the dam would be paid off in 50 years. This would allow you to fix structures after that. Also assumed the dam would last at least 100 years. For the financial calculations had to assume a lifespan over which to amortize the costs.

*Why 173 feet for the dam height – it seems low?*

That was the dam that was designed by PFRA – they had 2 options a low head and a high head dam in the study. This is the higher of the two. It pretty much floods the entire valley, I don't think there would be an option to flood it much higher.

Because of the ground conditions in the area, the slopes have to be relatively flat, so increasing the dam even a few metres requires a lot more dirt because of the slope requirements.

*Where do you plan to plant the trees to replace the cleared ones?*

That wasn't part of the scope of the study. But with any kind of development like this through the environmental assessment process there would be some mitigation requirements in terms of habitat, and so on. Cutting the trees is actually important to maintain the quality of the water. Planting trees might be something that is required but is far beyond the scope of this study.

*Would the trees be piled and burned?*

That is another thing that would need to be investigated in a more detailed analysis. It is a significant issue that would need to be studied and you would have to account for that level of disturbance and cost. There are a lot of trees in the valley – that is not a small task.

*Is a smaller dam under possible consideration?*

You could build a smaller dam that would be cheaper although then you might not be able to include hydropower in the same way. We have not moved an option like that forward, as it would have to be designed from scratch. We tried to assess the full range of options that could be explored for water management – a big dam is at one end of the scale and no investment is the other – there are numerous options in the middle that could generate benefit and result in different costs. The four that were selected were designed to give a comparative assessment

*What if Alberta built a dam downstream?*

It would provide them with storage but they would still have to allow some water to flow through to Saskatchewan.

*Could a dam still be built if Alberta built a dam?*

Yes, that makes it more complicated in terms of how much water is released to Saskatchewan, but it would still be possible.

*How will it be decided where the water will be allocated? Farmers, oil and gas, etc.*

It would be decided in the same process that you have now – you would make an application for a license for water rights. There are a couple of things that could be explored with that – there are watershed committees in the province and Sask Water is involved with them – part of land use planning in the region is part of water management – so what are the industry priorities, how do you sustainably manage water, what are the potential benefits are really part of regional planning that is generally part of the provincial governments mandate to work with the regions to develop and make decisions about

*Dam feasibility: How much of the current dams are being used? To what % of their potential?*

The Gardiner Dam, the developed irrigation is about 30% of the total potential for irrigation, other uses for that dam are recreation, flood mitigation, which is a pretty major issue. If the Gardiner Dam broke suddenly, the flood wave would reach to about the 5<sup>th</sup> floor of the Bessborough. Other dams, EB Campbell is hydro and recreation, the generation from Gardiner is pretty much at their planned operation. The primary use of the current dams is hydro power which is being quite fully utilized. Irrigation potential has not been to the max that it could be. Recreation could likely also be more developed. Industrial development could also likely increase.

*Why was Gardiner Dam originally built?*

*The reason was because Diefenbaker wanted money to be spent in the West as it was all being spent in the East. (NOTE: this was a comment from a member of the audience).*

*When you talk about the amount of water that could be used for irrigation, did you consider how much of the land was actually suitable?*

When we looked at the Dam option, there are 50,000 acres near the river with high suitability for irrigation near the river. The blocks on the map are about 12,000 acres each of highly suitable irrigation land.

*For the dam, what will be done with sediment in the reservoir and how will reduced sediment impact habitat downstream?*

Over time sediment would accumulate in the reservoir. At first it would accumulate mostly in Alberta and over time you would have sediment accumulation in the reservoir and we have an estimate of time to accumulate 10-15% of the volume at which time it could affect operations of the dam at the downstream end and that is approximately 200 years. It is important to recognize that by putting a structure on the river you impact how water moves sediment, moving water carries more sediment than water that is standing still. The types of changes that would occur upstream would make for poor shoreline vegetation as a result of slumping and dirt entering the reservoir. Starting to fill up the bottom over time and covering up habitats on the bottom has an impact on the productivity of the reservoir and how much food it makes for fish. On the downstream side you are taking a lot of sediment away and it will start to eat away at the bottom of the river channel – the channel will get deeper as the water looks for sediment to move around, you will lose sandbars and change the nature of the channel which also impacts fish habitat. The downstream Battle River Tributary is relatively muddy and because it comes in shortly after the dam, this could mitigate the impact downstream of the Battle River.

*Are there lots of fish in Diefenbaker? How did they get there?*

Fish will live in some areas, not in others. Over time sediment accumulates, over time draw down impacts productivity, it doesn't mean it isn't productive, it just means that you change the habitat

*How would water available for irrigation be allocated?*

It is usually licensed out. Sask Water has the ability to give those licenses and that is how smaller projects are happening right now.

*In discussions with SaskWater – the land between here and Payton makes irrigation cost prohibitive and the land isn't all that suitable either.*

*Need to consider how options compete with each other? Because you do one thing you can't necessarily do something else/*

It might conflict if you are trying to allocate more than is available, but if you stay within the amount of water that is available, you should be able to fulfill a number of different uses. That is an issue that would require investigation before a particular option was put forward, but it is outside of scope at this point in the study.

*Is SaskPower interested in the power produced with this project?*

They would gladly accept bringing that power into the grid. If it was a private producer, they would negotiate the price of that power. We assumed it would be sold to the grid at 7cents a kWh. This is on the SaskPower list of potential development sites, but is not near the top of the list.

*We talked with SaskPower in the last 30 days, they are not interested in participating in the project but they would buy the power from a private producer.*

*If 50% of the water is AB, 25% is SK and 25% is MB, could we drain the river completely?*

No not really, there are other aspects that go into what is acceptable based on public policy and I don't think that most people in the province would accept that not considering the requirements to maintain a healthy ecosystem, but that is a public policy and political decision, but don't think that would be acceptable.

*If AB doesn't use the water doesn't that mean that SK can use it?*

You could use it, but they might decide that they want it later, but because Saskatchewan is only entitled to 25% that is all that SaskWater will issue permits for.

*Does that mean that all of SK allotment would be to the NSRWRC?*

The 25% is available to everyone across Saskatchewan. A dam doesn't take it all, it only contains some and allows it to be used for other purposes. It requires a certain amount to be released. PA would not be in trouble as drinking water availability is a high priority – no one will let one project damage access for others.

*Off Channel storage – less benefit to province as a whole, more to specific individuals?*

Depends on how many you would develop, as it is designed to be modular.

*Are weirs covered under one of the options?*

None of the 4 options include a weir in the river although the off-channel storage option may require a weir. There would have to be a detailed study to determine a good location for an intake which would impact whether or not a weir was required downstream to provide some backwater and depth for drawing water.

*Why wasn't this meeting advertised better?*

*How far up the Big Gully will the water go? Will the trees have to be removed?*

Trees will have to be removed in areas that are flooded. There will be a significant amount of water that goes up the gully.

*How many historic sites have been identified?*

Don't know the total number, but there are many that are impacted. A heritage site can be something like an arrowhead discovery, as well as larger sites. Fort Pitt would be under water.

*What would the elevation change be at this area?*

531m top of bank, 489m bottom of the river.

*How much would the decks of the bridges have to be raised? (Deer Creek and Lee Park bridge)*

Talked to Sask Highways about mitigation costs and they came back with replacements costs. Those major bridges were \$30M to replace. Have the numbers for the bridge deck heights, but don't have those values at our fingertips. They would likely be under water at current levels.

*There is a lot of flood plain along the river that is currently farmed and is within 5-15 metres above the current river height, what would happen with that land?*

It would have to be purchased and it would be under water. In Alberta some of those areas might be flooded just part of the year.

***Stakeholder Comments:***

*It has taken my whole life to see bridges put on that river – when would you see something like this happening?*

*How many here are actually interested in irrigating and would if they had the opportunity – think this opportunity is being stressed more than people are interested in it.*

*How many people could afford to irrigate? Right now you don't have to pay irrigation rights, but if they built a dam you would have to pay for the rights and the lift. There is virtually no irrigation in this area because of the cost and the land suitability.*

In a lot of areas the soil just won't work. Realistically the only land that can be economically irrigated will all be under water.

Motion: This 4<sup>th</sup> option (i.e., a dam) should be abandoned for obvious reasons, the only place it would be feasible is near Battleford and in that case why not just concentrate on the others and leave things here as they are. The dam should not be built. There are other ways that water could be used in the area that would be beneficial.

*Why was Highgate the site?*

That was selected after a study by PFRA that investigated the soil and geotechnical conditions that were suitable for that type of development. Height of bank, width of channel, etc. At this stage of our study it didn't make sense for us to start looking at other locations and would require a lot more work for something that might not be feasible even at this preliminary stage.

*Most of the irrigation would be closer to Battleford, why not build a smaller dam further downstream where it would be used?*

That is something that can be considered at this next phase – now the committee has the information they will need to make this kind of decisions. It isn't for us to make these decisions.

*How would you propose to finance the dam?*

That has not been decided and that is why the financing charges were included. We don't know how it would be financed or who would pay for it. That has not been discussed. That is also not part of the Committees mandate, they are just trying to assess options for water use and management

*Under the original assessment was there any other dam sites proposed? Was there a second or third choice?*

In the 1970's PFRA did a whole study on the basin and there were a number of potential dam locations and diversion options looked at.

*When you looked at cultivated area in the proposed location, has there been more work done to the east and south regarding potential irrigation where it is more feasible?*

What we have here is an irrigation suitability map based on soil land classification. We did not look at specific locations, if someone wanted to propose projects in other areas that could be done, but we have looked at conceptual blocks that are close to the river and suitable land type, that is not to say there aren't other areas that could be irrigated if someone wanted.

*In hypothetical 200 yrs sediment will decrease the effectiveness of the dam... when it gets to that point what do you do with it?*

There are a number of options, it can be dredged, depending on how the dam is designed it might be flushed out with a large release, you could de-commission the dam, remove the dam, there are a number of different options. All of them expensive, but still options.

*How long would it take to fill up?*

The amount of the storage in river terms is about 250 days of flow, so if you didn't release any water in that time it would take 250 days, but you would have to release some water so it will take longer, the amount of time it takes will depend on how much you release during that time.

*Isn't the whole purpose of the study to get a pure source of assured water? Personally believe a dam is the way you need to go to get this. Every town you talk to has water problems. Maybe need to consider a series of small dams or weirs*

Those are all things that could be carried forward for investigation at the next stage. These options are the maximum to minimum with a few in between. Some of the other options such as off-channel storage could be used for regional municipal water supply as well, it doesn't have to be irrigation or industry.

*Can the dam be lower and still generate power? You can generate power with low head turbines / weirs and still generate power. A series of small turbines could likely generate the same amount of power as a large dam.*

As long as there is head difference you can generate electricity. The higher the head difference and the more flow, the more power you can generate. Generally, if you concentrate the flow and head difference, it tends to be the most cost efficient generation of power.

*If you go to the three meetings and the consensus is scrap #4, does that have any influence on future decisions?*

That is up to the committee. They will take the findings and decide how to proceed, we are presenting the findings. They may decide to investigate some options further.

*Has there been direct contact with adjacent land owners?*

For anything to go forward, you would need to meet with proponents. Once there was a project there would be much input and consultation with stakeholders. This is not a project at this point, but that will need to happen once it comes to that point.

*So comments will be considered?*

This is being gathered and will be made available for public record and will be read by the committee. They will be available to the Committee as they are making their decisions.

*Don't think that in 200 years there will be much left of the glacier to provide water, I don't think you can guarantee these figures in terms of water. See silting as one of the biggest problems. The large dam is basically ridiculous from a planning and financial viewpoint. It doesn't make sense for any reason. You need rule out the big dam concept fairly quickly and move to something that is more sustainable and something that will last. But there are major problems still to be considered.*

*Did you study the tributaries and how they will be impacted?*

Just in terms of flooding. We aren't doing an impact assessment at this point, they were considered in terms of the things that would be impacted – fish, residences, oil wells, etc. But there has not been a detailed study on any of those areas yet.

*I was wondering when you store water in a large lake does it accumulate the pollution or does it flow through like it does right now?*

That would require a fair amount of study, but what can happen as a result of sediments is segregating pollutants in the sediment layers and out of the water, or it might release more pollutants into the water eg) mercury which can be released as a result of flooded areas. Nutrients can also affect water quality – algae blooms, etc

*There seems to be a lot of studies done about up water. What about dam water in the case of a dam failure? It could become a terrorist target, what would happen with a 175 wave coming downstream?*

That would be part of a detailed engineering design. Dam would be designed not to fail, but analysis would be done to assess what would happen if it did fail, but potential failure of the dam and associated costs were not included in these costs, they are designed not to fail. But as part of a final design you would investigate what would happen if it did fail.

*Comment: our Sask highways are suffering and hospitals are closing in small towns, how can you justify \$5B in infrastructure that no one is asking for. It seems ridiculous to even be considering this type of infrastructure that there is no need for.*

*How many people would like to see option #4 struck: large majority (28 of 30) NOTE: some people had left the meeting prior to this informal "straw poll"*

***Committee Comment: (committee comments in italics, questions in regular font)***

Thank you for your comments, we will take them into consideration, won't try to predict how the board will decide, but appreciate the information you have provided.

The funding received for the study (Can Sask water expansion supply program) expires March 31, 2008 and so all invoices have to be in by that time. This has to be completed prior to that. Apologize for the timing of the meeting, but had to move forward as the information was available as this is a tight timeline. The project will be completed by the end of March and in reality has to be wrapped up by then. This project refers to the study around the options – completing the information package around what the options mean.

*Will there be any more public input into the Boards decisions?*

Depends on how you define public input. Everyone on the board has been appointed by a town, RM, city council. You can access these groups and discuss with them their decisions.

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