

Village of Slocan, Springer Creek Micro Hydro Feasibility/Viability Study

November 30, 2015 The Village of Slocan has done considerable work towards the project and is close to making a decision regarding a commitment to build.

Overview – The Village of Slocan has completed Hydrology and Environmental Reports, Preliminary Engineering and current costing. The Development Plan and application for a water licence and land tenure have been submitted, and preliminary investigations with Fortis and BC Hydro have been made. In reviewing the information that has been compiled, I would say that this work has been done in a professional manner, with a logical process by competent consultants, and the current projected costs and revenue seem realistic.

The revenue at the current time is expected to be \$294,000 with operating expenses of \$79,000 leaving \$215,000 for debt servicing and profit. Completing the water licencing, Fortis interconnect agreement and obtaining an energy purchase agreement with BC Hydro will finalize a number of details that will give relative certainty to the projected revenue. The completion of these tasks is expected to cost \$70,000.

The capital cost of the project is estimated at \$3,640,000. In order to attain relative certainty on costs, estimates need to be verified. This may be accomplished by either hiring a different engineering firm to confirm the estimate or to use a project delivery method that provides contractor's costs early in the design. Costs could vary from \$10,000 to \$30,000, depending on the method used to provide this information.

Financially the current projected return on investment is marginal and would be unappealing to the private sector. However, the Village is considering a broader range of benefits for the community and believes it is worthy of external funding. Sufficient grant funding would make the project viable.

Once the revenue stream, capital costs and external funding are known, the Village can determine if its revenue goals will be met and the project is a "Go".

Revenue Stream – The gross revenue is based on the BC Hydro Standing Offer for small hydro, which is a fixed price per unit of energy produced and includes a yearly inflation escalator.

The amount of energy that is produced is directly related to the water flow through the power house. This water flow is the total water flow down the creek, less the portion of water that has to remain in Springer Creek for fish and other environmental needs, as detailed in the water licence. The projected water flow is based on 18 months actual readings and then correlated to similar streams in the area that have long term Environment Canada data. The water flow projections are well documented and seem realistic. However, as we wait for the other processes to be completed, it makes sense to continue actual water flow readings to give an additional level of comfort that the hypothetical flow continue to correlate to actual flows.

Recommended activities to confirm the revenue projections:

The initial step is to have the water licence in place as soon as possible. Any increase in the conservation flows will have a negative influence on projected revenues. Negotiations are ongoing between FL&NRO, Ministry of Environment and Village of Slocan consultants.

Secondly, the capital cost of the Fortis Interconnect Agreement to upgrade their equipment to wheel (carry the power over their infrastructure) needs to be established. A current application is required and Fortis will likely request \$31,500 to initiate engineering and design services to establish the cost. The Village and BC Hydro will need to be involved in preparing the agreement, as it will establish the operating parameters of the power house and the power requirements as it enters the BC Hydro grid.

Thirdly, when the water licence and Fortis interconnect study are completed, an application under the BC Hydro Standing Offer Program for an Energy Purchase Agreement needs to be submitted.

Once these steps are finished the Village will have relative assurance of ongoing revenues to evaluate the project.

Approvals – The Final Development Plan was submitted to FL&NRO in the summer of 2014 and the ministry subsequently referred it to other stakeholders including First Nations. FL&NRO staff has indicated the only outstanding issue is fish flows. Winter environmental flows that remain in the creek, based on the environmental studies, are proposed to be 10% MAD (Mean Annual Discharge). Ministry of Environment is suggesting an increase to a 20% MAD which, if required, will reduce the projected revenue by \$75,000.

The water licence needs to be put in place as soon as possible.

Engineering and Environmental Consultants – Mike Walsh of SNT Engineering has been the lead professional and acted as project manager for a number of years. He has conducted business in a professional, competent and cost effective manner and given the Village of Slocan good value. It would be inappropriate to consider another consultant unless SNT's proposal to take the project to completion is not consistent with past work and/or outside of industry standards.

I would suggest initiating discussions with SNT Engineering with the intent of requesting a proposal for engineering and management services to take the project to completion. This proposal should include discussion of engineering services, project management, cost control and project delivery methods.

Construction and Project Delivery Systems – The Design, Bid, and Build is the most common construction delivery method and consists of a general tender and contract which includes all works required to complete the project under one general contractor. This method requires the least amount of administration, coordination and professional oversight from the Village but can be expensive. However, at times, it may be the best value and gives a relative cost guarantee as to the final cost of the project before the capital works begin. Should the lowest bid in this scenario not be within budget, it can always be stipulated that the Village has the right to negotiate with the bidder(s) to bring the project within budget.

The Village can choose to do the project management themselves using local contractors where possible to achieve innovation, price savings and a closer connection to the community. SNT Engineering has indicated that they would be interested in this scenario and could act as a partial construction manager. This method requires a considerable elevation in administration, coordination and professional oversight for the owner. In addition, while substantial price savings may be realized, no guarantees on the total cost of the project are apparent before giving the full "Go" ahead.

A third design/construction method is being discussed with SNT Engineering. It is called the Integrated Project Delivery method (www.ipda.ca) and is driven by the fact that the design has a significant bearing on the cost. The owner brings together a project delivery "team" which provides a mechanism for the engineers to work with the contractor(s) early on; optimizing the design with respect to cost efficiency and accurate estimates.

Integrated Project Delivery contracting is generally understood to describe an arrangement where parties enter into an agreement to work cooperatively and to share risk and reward, measured against performance indicators. The owner and service providers work as a single integrated team to deliver a specific project, under a contractual framework, where their commercial interests are aligned with actual project objectives.

The evaluation of these different alternatives is mainly based on resources available and the Village of Slokan's trust in those resources. The Design, Bid, Build options is at arm's length from Council with most decisions being made by others. The Project Manager Option puts Council's faith in that manager based on the deliverables agreed upon. Council can be involved as much as they want but in reality the Project Manager makes most of the decisions. Integrated Project Delivery relies on the owner/engineer/contractor "team" to design, build and deliver the project. The latter sounds good in theory but it is relatively new and would require a willing commitment from all participants.

"Each of these project delivery methods carries a different level of risk for the owner. Generally, the level of control retained by the owner correlates with the level of risk, and those levels typically have an inverse relationship to the risk and control levels of the contractor."

The Integrated Project Delivery delivery method is different but should be explored with Mike Walsh and local contractors.

Plant Operation – Village staff operation of the plant is preferable over an operation contract as the in-house knowledge will be invaluable going into the future. However, staff needs to be included in the construction process and trained as well as having knowledgeable backup resources. Perhaps the City of Nelson or Fortis could be contracted for monthly visits for the first year and be available during maintenance and outages. Village staff could also carry out the record keeping and environmental monitoring that is usually required.

It is suggested that input be received from Village staff to ascertain if it seems feasible for them to undertake the new challenge of power plant operation.

Financial - Financially the current projected return is not viable for a capital investment of \$3,640,000. However, the Village is considering a broader range of benefits to the community and believes it is worthy of external funding. Sufficient funding would make the project work.

The report to the Columbia Basin Trust “*Review of Springer Creek Hydro Project*” has presented a detailed Financial Analysis Summary. Comments on external grant funding of \$1.6 million (Scenario 3) are “economics are very tight and the project would require ... experienced management, cost control, efficient project delivery and further certainty on costs.”

Yearly finances for Scenario 3 (\$1.6 million grant) are:

Gross Revenue	\$294,000
O & M Costs	79,000
Debit serving	<u>117,000</u> (\$1.6 mil Grant, \$1.25 mil at 3% & \$0.57 mil at 6% Debit for 30 yrs.)
Net Yearly Revenue	\$ 98,000*

Also presented is Scenario 2 that considers grant funding of \$2.5 million.

Yearly finances for Scenario 2 (\$2.5 million grant) are:

Gross Revenue	\$294,000
O & M Costs	79,000
Debit serving	<u>60,000</u> (\$2.5 mil Grant, \$1.04 mil at 3% MFA Debit for 30 yrs.)
Net Yearly Revenue	\$155,000*

*Any water licence adjustments may have a significant impact on revenues.

The project is viable with external funding of \$1.6 million but as stated, “economics are very tight” and probably would not be appealing to the private sector. External funding of \$2.5 million would allow a financial cushion, increase the return on investment and make the project more attractive for the Village of Slokan.

Based on information we currently have it appears \$1.6 million of external funding is a minimum that is required for a viable project. However, additional funding over that level would allow some cushion as a number of variables have yet to be quantified.

Conclusion – The project requires external funding to be a success. To establish relative financial certainty the water licence needs to be in place and the Fortis Interconnect Agreement and BC Hydro Energy Purchase Agreements need to be completed. It will cost up to \$100,000 accomplish this.

Once the revenue stream, capital costs and external funding are confirmed, the Village can decide if its revenue goals will be met and if the project is a “Go”.

The Village of Slocan has asked the following specific questions be addressed:

1) Independent engineering costing?

Retaining an engineering firm experienced in small hydro to attain reasonable cost certainty is one option during the final decision as to proceed with the project. However, trying to get cost certainty before the variables in the project's main components are removed is premature. This costing should be considered as the water licence, Fortis interconnect agreement and BC Hydro SOP agreement are being put in place and the decision to "Go" is being made.

2) Project delivery strategy options?

Two basic methods are available to the Village to construct the project. The first would be a general tender and contract including all works required to complete the project under one general contractor. This method requires the least amount of administration, coordination and professional oversight but can be expensive. However, at times it may be the best value and it gives a relative cost guarantee as to the final cost of the project before the capital works begin.

Secondly, the Village can choose to do the project management themselves using local contractors to achieve innovation, price savings and a closer connection to the community. This method requires a considerable elevation in administration, coordination and professional oversight. In addition, while substantial price savings may be realized, no guarantees on the total cost of the project are apparent before giving the full "Go" ahead.

A third option worth considering is called the Integrated Project Delivery method which brings together a project delivery "team" which provides a mechanism for the owner and engineers to work with the contractor(s) early in the design to identify cost efficiencies and provide construction estimates.

Working through the agreements with the Province (water licence), Fortis and BC Hydro will take time. The Village and their representatives may want to engage local contractors to assess what resources are available, with a goal of establishing what delivery system is best suited for the project. A continuing dialogue with local contractors and equipment suppliers will enhance the knowledge, give clarity and make a "Go" decision much easier.

3) Understanding the FortisBC/BC Hydro costs and agreements?

In April 2013 Fortis estimated \$315,000 to connect to BC Hydro and requested \$31,500 to begin a study. This estimate is now out of date and the application needs to be renewed. The study needs to be completed to get the real cost for Fortis's connection to BC Hydro to wheel the power produced by the Springer Creek Hydro Plant.

4) BC Hydro will not consider a Standing Offer Program application until the water licence is secure and the Fortis Interconnect Study is complete.

Fortis needs to do the study and BC Hydro SOP requirements need to be met before we can further refine the costs involved with the agreements. In addition, during the Fortis study process clarity of responsibility for each component needs to be detailed in the agreements as Fortis is carrying Village of Slocan power to BC Hydro and a number of things can happen along the way. Where does BC Hydro

measure the power to pay the Village? Who is responsible for what components and within what parameters? It is going to take time for BC Hydro and Fortis to agree on who is responsible for what. An owner's representative should be involved in the process to ensure the Village of Slocan's rights and responsibilities are clearly identified.

5) Confirming licence/Front Counter BC?

The water licence and land tenure need to be issued to meet BC Hydro SOP requirements. This licence is key to the entire project and needs to be secured as soon as possible.

6) Additional development costs needed to reach a "Go" decision?

Prior to a "Go" decision the water licence and land tenure need to be secured, Fortis interconnect agreement in place, Energy Purchase Agreement with BC Hydro as well as an accurate cost of construction that will allow the Village to meet its revenue goals. Currently I would suggest that \$70,000 would be required by mid-2016 for the Fortis study, water licence issuance, preparation of the BC Hydro SOP submission and beginning the dialogue with contractors regarding actual construction. Although difficult to estimate, up to \$30,000 may be needed to secure the EPA from BC Hydro and attain reasonable certainty for project costs prior to a "Go" decision.

Jack Allingham

November 30, 2015

Appendix 1 - References

Review of Springer Creek Hydro Project for CBT	Victor Jmaeff	May 2015
Springer Creek Development Plan	Skmana Crk Consult	January 2014
Preliminary Eng & Project Costing Report	Selkirk Power Co	December 2012
Hydrology Assessment	Selkirk Power Co	November 2012
Detailed Unit Pricing Report	SNT Engineering	February 2015
Electrical Service Request	FortisBC	April 2013
Springer Creek Fisheries and Instream Flow	Masse Environmental	May 2012