

**A REVIEW OF METHODOLOGIES FOR EVALUATING THE BENEFITS OF A
COLD WATER RELEASE FACILITY AT KENNEY DAM**

**Submitted to the
Nechako Watershed Council**

by

**Gary Holman
Consulting Economist**

February 18, 2002

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1.0 Introduction and Study Approach

The purpose of this proposal is to identify and recommend an evaluation method that can be applied to assess the potential environmental, economic and social benefits of a proposed cold water release facility at Kenney Dam on the Nechako River. The Kenney Dam was constructed in 1952 as part of Alcan's development of the Nechako reservoir. The flooding of the reservoir resulted in substantial impacts on the natural flow regime and resources of the Nechako and Cheslatta watersheds, including the displacement of several First Nations communities. The Nechako Environmental Enhancement Fund (NEEF) was created as part of the 1997 British Columbia – Alcan agreement to enhance the downstream environment of the Nechako watershed area.

The Nechako Watershed Council (NWC), comprised of 25 organizations in the Central Interior and Northwest regions, has recommended to the Nechako Environmental Enhancement Fund (NEEF) the construction of a cold water release facility (CWRF) at the Kenney Dam as the most effective option for enhancement of the Nechako watershed. The NEEF Management Committee adopted this recommendation in its final report of June 7, 2001. The CWRF is considered to be the single most important mechanism for restoring and enhancing a range of benefits, including: fish and wildlife restoration and enhancement, flood control, restoration of natural flow regimes and related recreation and aesthetic values, commercial and property values, safety and hydro power. However, the operating regime for such a facility (i.e., that would establish water flow patterns and levels throughout the year) has yet to be finalized, particularly for low water years in which potential conflicts between various benefits would be most significant.

In recognition of the fact that an assessment of benefits and impacts of a CWRF facility would likely be required for federal and provincial funding and regulatory agencies, the NWC is taking the lead in identifying an objective framework to evaluate the social, environmental and economic benefits of such a project.

This report is based on the author's experience and a brief review of the literature with respect to socio-economic and environmental evaluation methodologies (see Appendix A, Selected Bibliography). Samples of some of these evaluations have been made available to the NWC for their review. Preliminary discussions were held with staff of various government agencies to better ensure the recommended evaluation methodology is based on sound economic principles that are consistent with approaches accepted by funding and regulatory agencies in the consideration of the relative merits of alternative projects and policies. However, more formal confirmation of methodological framework by key funding agencies is recommended before NWC proceeds with an evaluation.

The framework must also reflect the mandate of NWC, which encompasses a cooperative resolution of potentially competing interests, but is also fundamentally committed to the long term health of the watershed and the natural resources and human activities that it supports. The NWC also recognizes that the principle of sustainability (i.e., the extent to which environmental values, and related social and economic values are maintained in perpetuity) is becoming increasingly important as a key decision-making criterion. A

progress report and preliminary recommendations regarding an evaluation methodology was presented to the NWC on January 26, 2002. Comments on the key issues and recommendations were received at this meeting and incorporated into the final report.

Based on discussions with resource agency staff, the literature review, and feedback from the NWC, an evaluation framework for the assessment of the CWRP is recommended. Each approach has its advantages and there are some overlaps between frameworks. Also, even the “best” approach recommended to the NWC may have to be supplemented with specific methodological approaches in order to address some of the key evaluation issues. Some of these issues, including sustainability, are discussed in section 3. An estimated budget for the evaluation is outlined in section 6.

2.0 Summary of Alternative Evaluation Methodologies

There are two basic approaches to the evaluation of the overall benefits and costs of the CWRP project: cost-benefit analysis (CBA) and multiple accounts analysis (MAA). Each has its advantages and disadvantages. A third approach, Multi-Attribute Tradeoff Analysis (MATA), used primarily in the context of consensus-based decision-making processes, is also discussed. Some of the practical and conceptual difficulties common to these analyses are discussed in more detail in section 3 below.

2.1 Cost-Benefit Analysis

Cost-benefit analysis (CBA) is a technique for estimating overall, net social benefits of policies, programs or projects, that has been extensively applied at the provincial and federal level, and for which there is a large body of theoretical literature.¹ For commercial resources, net economic benefits refer to the revenues derived from the affected resources minus all of the public and private expenditures incurred to realize those revenues. For non-commercial resources, benefits are typically estimated by techniques such as contingency valuation (e.g., willingness-to-pay for recreation values) and avoided costs (e.g., for flood control benefits). To take into account the fact that benefits and costs may occur with different time patterns, they are “discounted” to a common, usually the current, year.

The emphasis in CBA is on impacts that can be “monetized” or expressed as dollar values, and therefore has been criticized for inadequately addressing non-commercial, environmental and social impacts that are difficult to quantify because of data and other limitations.² However, CBA also allows for inclusion of qualitative information and for techniques such as “threshold / critical value analysis”, for example, whereby data on benefits that are difficult to monetize (e.g. ecological diversity, aesthetics) is compared to

¹ For a general primer see *Cost-Benefit Analysis*, E. J. Mishan, 1975. For provincial and federal guidelines, respectively, see *Guidelines for Benefit-Cost Analysis*, B.C. Environment and Land Use Secretariat, 1977, and *Guidelines for Benefit-Cost Analysis*, Canada Treasury Board, 1976.

² Contingency valuation estimates can be particularly controversial, although this criticism would apply to any evaluation that incorporated such analysis. For example, see *Willingness-to-Pay and Compensation Demanded: Experimental Evidence of Unexpected Disparity in Measures of Value*, J. L. Knetsch, 1984, in *Quarterly Journal of Economics* 94(1):39-50.

quantifiable project costs.³ CBA also does not explicitly address the distribution of benefits and costs, for example, between regions, levels of government, or between industries and other stakeholders.

2.2 Multiple Account Analysis

Multiple account analysis (MAA) is a method which has been adopted by provincial land use planning agencies and Crown corporations for systematically documenting and evaluating impacts from a number of different perspectives or “accounts” at the provincial and regional level.⁴ These accounts include: jobs and income; environment; community / First Nations; government finances; and economic efficiency. The economic efficiency account is essentially a cost-benefit analysis.

Therefore, the MAA approach incorporates the CBA perspective, but also takes into account a number of other valid evaluation perspectives, explicitly incorporates values that cannot be easily monetized, and also addresses distribution issues. One of the criticisms of MAA is that because it does not rely on a single indicator (e.g., a cost-benefit ratio), it can be used to rationalize almost any policy choice or project. While this is a valid concern, the use of different accounts also ensures that the potential trade-offs resulting from any policy choice (e.g., commercial versus non-commercial values) are explicitly addressed.

2.2.1 Description of Multiple Accounts Framework

To simplify a multiple account assessment, several of the regional and provincial accounts can be combined. Combining regional and provincial accounts still allows for explicit discussion of distribution issues. For example, the economic development, environmental, and government finance accounts can include the analysis at the provincial and regional / local levels. Community and First Nations concerns could also be combined in one account. The economic efficiency, or benefit-cost account (a provincial account) should be treated as a separate account.

Note that if federal funding and regulatory approvals are required, it may also be possible to include the implications at the national level in the various accounts where appropriate. A simplified version of multiple accounts for the CWRP evaluation is outlined below.

³ This is also referred to as an “opportunity cost approach” in which analysts and decision-makers are asked to consider whether those benefits of a project which can only be described qualitatively, justify quantifiable costs less quantifiable benefits. Such calculations are often translated into annual or “levelized” costs to facilitate comparison. For example, assuming that the net present value of CWRP capital and operating costs less the net present value of salmon fisheries benefits was equal to \$50 million, this would mean that the net present value of all other potential social benefits such as flood control, tourism development and increased property values would also have to be at least \$50 million (equivalent to a annual, levelized value of about \$2.5 million per year) in order to justify the costs of the facility.

⁴ See *Multiple Account Evaluation Guidelines*, Crown Corporation Secretariat, October, 1993. See also *Social and Economic Impact Assessment for Land and Resource Management Planning in British Columbia: Interim Guidelines*, Integrated Resource Planning Committee, August, 1993. The guidelines for land and resource management planning are currently being reviewed and updated.

Regional and Provincial Economic Development

The regional account would document the direct income and employment impacts of the CWRF and associated impacts (e.g., on regional fisheries), as well as spin-off or multiplier effects, on the local and regional economies. The provincial component of this account parallels the regional evaluation, but also captures income and employment impacts in the provincial economy as a whole. In general, provincial impacts are larger than regional impacts since spending “leakages” are much smaller from the province as a whole versus individual regions. Also, the provincial account captures impacts on resources such as fisheries, which because of fish movements (e.g. for anadromous stocks such as salmon) are likely to be more non-local in nature.

Regional and Provincial Environmental Values

This account documents the nature and significance of impacts on non-commercial uses and values that people in the region attach to environmental resources (e.g. recreational fisheries, visual quality, water quality). The provincial component of this account parallels the regional evaluation, except that it documents impacts on environmental values that are of provincial significance or are important within the context of provincial policy objectives (e.g., endangered species such as sturgeon).

Community / First Nations Impacts

The purpose of this account is to document social impacts such as changes in population, local government finances, social services and quality of life. This account documents the social and economic impacts on native communities in the region. First Nations impacts are likely to be similar in nature as for other communities, but the magnitude of the impacts may be greater because of the lack of employment opportunities and the spiritual and cultural importance of traditional lands and resources.

Regional and Provincial Government Finances

This account would document changes in provincial government revenues and costs. The analysis in this account would provide an indication of the “return to governments” at various levels potentially generated by the CWRF facility. Any implications for local / regional governments could be addressed in this account or in the community / First Nations account.

Economic Efficiency of Resource Use

This account is similar to cost-benefit analysis, which attempts to estimate changes in quantifiable net social and economic benefits. For commercial resources, net economic benefits refer to the revenues derived from the affected resources minus all of the public and private expenditures incurred to realize those revenues. For non-commercial resources, benefits include both user (e.g. recreation) and non-user (e.g., existence) values. Net social benefits could also include “avoided costs” such as flood damage.

2.3 Multi-Attribute Tradeoff Analysis

A third approach, Multi-Attribute Tradeoff Analysis (MATA) has been applied in land and water use planning as part of a structured process for identifying and valuing the objectives of various stakeholders affected by particular resource management decisions.⁵ This method has the advantage of quantifying and summing up value judgments of participants for various, sometimes conflicting objectives (e.g., regarding the impacts of alternative water flows and levels on indicators such as fish habitat and hydro power). Therefore, MATA can assist in developing a consensus among stakeholders by “providing an answer” (analogous to CBA) to the question of which operating regime optimizes the value of sometimes competing objectives.

The weakness of this approach lies in the conceptual difficulty of comparing and summing subjective values that may or may not reflect accurate information on the magnitude and significance of actual resource impacts. For example, while an objective might be to maintain water flows and levels within a certain range in order to reduce flooding but at the same time achieve fisheries and recreation objectives, MATA does not provide stakeholders with the estimated value of these various outcomes. Also, while this approach may be of some use in developing and justifying the optimal design and operating regime for a CWRF, it is unlikely to be acceptable to federal and provincial agencies as the sole basis for funding and regulatory approval of the overall facility.

The Ministry of Sustainable Resource Management is already assisting the Nechako Watershed Council with water flow modeling in order to determine the minimum and maximum water flows and levels within which the CWRF facility should be operated to achieve certain key objectives of the various NWC stakeholders. In other words, the NWC is already embarked on a kind of MATA process. Apparently, the NWC has almost reached consensus on desired water flows for the average water year and is also likely achievable for high water years. However, consensus could be more difficult to achieve for low water years, and will likely require further water flow modeling and consideration by NWC of how alternative flow regimes meet various environmental, social and economic objectives. A more formal MATA analysis may be helpful to the NWC to assist in considering the implications of flow regime alternatives.

3.0 Evaluation Issues to be Addressed Regardless of Framework Chosen

To a certain extent, the choice of an evaluation framework is a choice regarding how social benefits and costs are organized. Regardless of the framework chosen, there are some fundamental evaluation issues that must be addressed, as summarized below.

3.1 Commercial Versus Non-Commercial Values

Often, non-commercial values such as recreation and endangered species are not adequately represented in economic analyses because of difficulties in quantifying such values. There are ways of monetizing non-commercial values (e.g., by estimating

⁵ See *Water Use Planning Guidelines*, Province of British Columbia, 1998.

willingness-to-pay or avoided costs of recovering a nearly extinct species). However, it is also important to quantify biophysical impacts (e.g., water temperatures, fish habitat), even if they cannot be easily monetized, in order to capture all of the implications of particular projects. Biophysical measures can also be important for considerations of cost-effectiveness. This means that the evaluation framework should make explicit provision for input and data from technical experts other than economists (i.e., biologists, engineers, hydrologists). Also, the framework must make specific provision for qualitative discussion of implications.

3.2 Time Preference or Discount Rate

The discount rate measures the extent to which individuals, firms and society at large, prefer to receive income sooner rather than later. The issue of discount rates is controversial, and bears significantly on the implications of sustainability. For example, lower discount rates can reduce the net present value of resource values that are generated or enhanced over longer periods of time compared to resource development that results in shorter term benefits that may not be sustainable over time.⁶ There is considerable support among economists for the use of lower discount rates because longer term benefits, such as sustainability of environmental values, are given more weight than if discounted at higher rates.⁷

3.3 Overall Benefits of a Facility versus Alternative Design Configurations

There are two basic issues to be addressed by the evaluation. The first is to document the benefits of a CWRP facility compared to no facility at all. Another issue is the optimal design and operation of such a facility. The latter question is much more difficult to evaluate since it involves the consideration of incremental effects of different designs or flow regimes. Ideally, the evaluation method should lend itself to the assessment of alternatives. As described below, a spreadsheet model can be very useful for this type of analysis.

3.4 Uncertainty

There can be considerable uncertainty regarding such evaluation issues. Uncertainty can be due to considerable technical debate (e.g., with respect to appropriate discount rates) and to lack of data on the incremental, biophysical impacts of water flows and temperature. Such uncertainty is usually addressed by sensitivity analysis that explicitly addresses the implications of a plausible (i.e., technically defensible) range of values. Such an analysis can be cumbersome if considering number of design alternatives as well, and further reinforces the need for an evaluation tool such as a spreadsheet model.

⁶ To illustrate, \$100 in income (in constant i.e., 2001 dollars) received 50 years from today has a net present value (NPV) of about \$22.80 if a real discount rate of 3% (i.e. after inflation) is used. If a discount rate of 10% is used (typical of rates of return expected in private sector investments), this same income has an NPV of only 85 cents.

⁷ See a discussion of discount rates in *Environmental Economics*, B.C. Field and N. D. Olewiler, 1995.

3.5 Distribution of Benefits and Costs

Cost-benefit analysis is an accounting of total social benefits and costs. Another important economic and public policy issue concerns who benefits and who pays the costs. The distribution of benefits and costs of projects and policies can vary substantially by sector, region and level of government. As noted above, MAA explicitly addresses the distribution issue.

3.6 Definition and Evaluation of the Base Case

It should be noted that an important first step in any evaluation is to clearly define the “base case” (i.e., implications for the Nechako watershed if the CWRF facility is not built). Without a clear understanding of the base case water regime and related impacts, any assessment of the implications of the CWRF cannot be technically defensible.

3.7 Sustainability

Sustainability is not generally considered explicitly as part of traditional cost-benefit evaluation framework. It has been argued that cost-benefit analysis is inherently biased against a long term, environmentally sustainable perspective because of the use of high, market-driven discount rates and the difficulty of monetizing non-commercial values. However, an evaluation framework that is technically sound, is not necessarily inconsistent with sustainability principles. For example, the use of lower “social time preference rate” is often defended in the academic literature, and there are numerous ways in which non-commercial values can be monetized, or at least quantified.

3.8 Modeling Tools to Facilitate Evaluation of Alternative Scenarios

Regardless of the evaluation framework recommended, it is suggested that a spreadsheet model be developed to calculate economic impacts and benefits. Such a model will be particularly useful for considering alternative flow regime scenarios for the CWRF, the implications of changes in key assumptions (e.g., regarding discount rates and ranges of estimates for non-commercial values), and for developing a range of values for key economic benefits. Such a model could also help identify threshold values for certain non-commercial benefits (e.g., the value of non-commercial benefits required to justify the costs of the facility less benefits that can be monetized).

4.0 Comments on Evaluation from Funding / Regulatory Agencies

A key consideration in the selection of an evaluation framework is whether it is acceptable to, or used by funding and regulatory agencies. Initial contacts have been made with provincial and federal representatives to discuss evaluation requirements by respective governments considering decision criteria for the CWRF project. Very preliminary discussions were undertaken with staff of the following agencies:⁸

⁸ See Appendix B, List of Contacts.

Western Diversification Fund (WDF)
Fisheries and Oceans Canada (DFO)
BC Hydro (BCH)
Provincial Treasury Board (TB)
Ministry of Competition, Science and Enterprise (CSE)
Ministry of Sustainable Resource Management (SRM)
Ministry of Water, Air and Land Protection (WALP)
Environmental Assessment Office (EAO).

A brief summary of these discussions follows below. While these discussions were useful, it is strongly recommended that further clarification be sought regarding the evaluation requirements of key funding and regulatory agencies. An illustrative draft letter requesting such clarification has been provided to NWC as a separate document to this report.

- Despite the existence of federal and provincial guidelines for CBA and MAA, most of the agency staff interviewed indicated that such guidelines do not explicitly govern the evaluation of provincial financial support for projects or programs. An exception is MSRMA, which use the MAA guidelines to assess land and resource management plans in BC. In general, agencies will require a clear and concise assessment of the relevant economic, environmental and social benefits and costs of the project. Staff of provincial and federal agencies indicated that implications for government revenues or “return on investment” is an issue of interest, which would be covered by the government finances account within the MAA framework.
- The lack of reference to explicit guidelines means greater flexibility in terms of addressing factors such as sustainability and non-commercial values which have not been adequately addressed in standard cost-benefit evaluations. However, the lack of clear evaluation criteria could be problematic because the evaluation criteria or the “goalposts” can be more easily moved.
- BC TB staff indicated that the discount rate for evaluation purposes was set at the cost of government borrowing, currently at about 5% (nominal, i.e., including inflation). This is lower than the range of discount rates typically specified by cost-benefit or multiple accounts analyses, usually ranging from 6% to 10% (i.e., after inflation), based on private sector rates of return on invested capital. As noted above, application of a lower discount rate means that longer term environmental and social benefits of the CWRF will be given more weight than if discounted at higher rates.
- CSE staff indicated that the current government supports the principle of sustainability, and also in principle, the Alcan – BC agreement to restore the Nechako watershed environment. The province has apparently committed funding for the project evaluation, but has not yet indicated to what extent, or whether it would match Alcan’s commitment of up to \$50 million. CSE staff indicated that a range of design and operating alternatives should be considered for the facility, and the alternative that optimized net economic, environmental and social benefits, identified.

- WDF and DFO staff indicated that part of any project evaluation should consider whether the same objectives or level of benefits could be achieved by alternative means. DFO, which is currently the lead federal agency with respect to the project, also indicated that the CWRF facility should be evaluated as part of a larger water management system. It is known that DFO uses a version of a multiple account framework for evaluating and ranking its salmon enhancement investments.
- Staff from several agencies indicated that the CWRF would quite possibly require both a federal and provincial environmental assessment process. However, it is likely that such assessments would be integrated as much as possible to avoid unnecessary duplication of effort. While an evaluation of benefits for potential funders of the CWRF would provide some information that could be useful for the environmental assessment processes, additional information would also likely be required.

5.0 Conclusions and Recommendations re Evaluation Methodology

To a certain extent, CBA and MAA frameworks encompass similar evaluation principles and are sufficiently flexible to address particular issues of concern for specific projects (e.g. sustainability, non-commercial values, discount rates). ***However, it is recommended that the provincial MAA approach⁹ be adopted since it has the advantage of incorporating cost-benefit analysis as one of the accounts, but better ensures that all relevant social, economic, environmental and distribution issues (including government finances) are explicitly addressed. For purposes of simplicity, it is suggested that some of the accounts be combined (e.g., regional and provincial).***

It is recommended that the focus of the economic efficiency component of the evaluation should be an analysis of the quantifiable benefits and costs of the CWRF.

The other accounts can then be used to “adjust” the cost-benefit analysis with qualitative and quantitative information on the social, environmental and economic implications of the project. This approach to the evaluation also lends itself to the identification of critical or threshold values for CWRF benefits that cannot be monetized.

The NWC is currently attempting to reach consensus on a flow regime for the CWRF facility, which would then serve as the basis for the funding proposal and evaluation. ***However, if consensus cannot be reached on the flow regime, the evaluation could include several scenarios in order to assess the range of benefits associated with different flow regimes which emphasize different objectives.***

While an evaluation of benefits for potential funders of the CWRF would provide some information that could be useful for the environmental assessment processes, additional information would also likely be required. ***However, it is recommended that the focus of the evaluation, at least initially, be directed at an assessment of facility benefits for purposes of developing funding proposals.***

⁹ As defined in *Social and Economic Impact Assessment for Land and Resource Management Planning in British Columbia: Interim Guidelines*, op. cit.

Benefits such as fisheries and flood control can be difficult to evaluate regardless of the methodological approach adopted by the NWC, but will not be possible at all if data on the incremental, biophysical impacts of the CWRP facility is not available. *It is recommended that the NWC seek some additional advice on specific methodologies and data requirements for some of the most important biophysical impacts of the CWRP in order identify and address any key data gaps as soon as possible.*

Evaluations are usually forward looking, based on consideration of the incremental social benefits of projects or policies at any point in time, taking history as a given. While the historical development of the Kemano hydro-electric facility has generated significant economic benefits, it has also resulted in substantial environmental and social costs for which there has been inadequate mitigation and compensation. If the economic, social and environmental costs of past decisions which have damaged the Nechako and Murray-Cheslatta watersheds are addressed in the evaluation, at the very least qualitatively, the rationale for the CWRP facility would likely be strengthened. *Therefore, the Nechako Watershed Council should consider including in the terms of reference of the evaluation, a discussion of the nature and significance of damages resulting from historical resource development and management decisions.*

6.0 Estimated Cost and Timeframe for Evaluation of CWRP

An estimate of professional fees and expenses, including the cost of developing a spreadsheet model for the quantification of benefits and costs for different scenarios, and the required timeframe for the evaluation of the CWRP is provided below. The cost estimate is based on the following assumptions regarding the evaluation:

- the main purpose of the evaluation would be the estimation of benefits and does not include all of the information or provisions required to take the CWRP proposal through provincial and federal environmental review assessments
- provincial and federal resource agencies would be willing and able to assist with data collection and analysis, particularly for biophysical impacts (e.g., fisheries impacts)
- the evaluation might address up to three scenarios with respect to the operating regime (e.g., different flow regimes with somewhat different emphasis on key objectives)
- the evaluation would be based on readily available data (e.g., extensive surveys or scientific field work would not be required), historical experience with the current management regime, and professional judgment regarding the nature and magnitude of impacts
- uncertainty in biophysical impacts and economic benefits would be addressed by estimating a range of possible impacts around a “most likely” impact.

6.1 Key Data Requirements and Study Team Expertise

The key data requirements for an evaluation of CWRP benefits would include:

- biophysical impacts of alternative CWRP regimes (e.g., fish populations by species, frequency and severity of flooding, electricity production, etc)
- nature of linkage with cold water flows (e.g., are fisheries benefits a continuous relationship in which larger flows mean larger populations, or where certain minimum thresholds are required)
- value of biophysical impacts (e.g., commercial, sport, First Nations fisheries values, cost of flood damage, value of electricity, recreation values, etc.)

A spreadsheet model could be developed to facilitate the evaluation of alternative assumptions and scenarios. The evaluation would require an inter-disciplinary study team, with expertise in fish and wildlife biology, engineering and hydrology, recreation and tourism, and economics.

6.2 Study Cost Estimate

The following study cost estimate (excluding GST) is based on a weighted average professional per diem of \$600 / day. Travel expenses are based on the assumption that several person-trips of travel to and within the region would be required to consult with resource agency staff and stakeholders on the Nechako Watershed Council, although most consultation would be by phone and e-mail.¹⁰ Total estimated costs are estimated to be in the order \$60,000 plus or minus \$10,000, depending on the availability of data, assistance from resource agencies and fee structures of the selected study team. There should also be flexibility in terms of budget allocations between fees and expenses, depending on priorities that emerge during the evaluation.

Professional fees:

Biophysical / environmental implications	55 days @ \$600 / day	\$33,000
Economic implications	35 days @ \$600 / day	<u>\$21,000</u>
	Total Professional Fees:	\$54,000

Expenses:

Travel		\$ 3,000
Report production		\$ 2,000
Telephone / other		<u>\$ 1,000</u>

Total Expenses: \$ 6,000
TOTAL STUDY COST (excl. GST): \$60,000

¹⁰ The study approach, work tasks and approximate budget for the evaluation were discussed with Clyde Mitchell of Triton Environmental Consultants Ltd. There was general agreement on these issues, but the description in this report is the responsibility of the author.

6.3 Study Timing

It is estimated that if no primary research is required and resource agencies can assist with resource analysis, the study could be completed within 4 months. There should be regular progress reporting and a draft report should be available for resource agency and NWC comments after 3 months. The return of these comments to the study team and the preparation of a final report should then be completed one month later.

Appendix A Selected Bibliography

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Water Use Planning Guidelines, Province of British Columbia, 1998.

Appendix B
List of Contacts

Contact	Organization	Phone #
Jason Hwang	Fisheries and Oceans Canada	250-561-5396
Steve Rhodes	Western Diversification Fund	1-888-338-9378
Daryl Fields	BC Hydro	604-623-4446
Linda Chase-Wilde	Ministry of Competition, Science and Enterprise	250-952-0338
John Fuller	Provincial Treasury Board	250-387-9040
Gordon Enemark	Ministry of Sustainable Resource Management	250-387-8685
Peter Becker	Ministry of Water, Air and Land Protection	250-952-6791
Derek Griffen	Environmental Assessment Office	250-387-1543
Glen Davidson	Ministry of Sustainable Resource Management	250-565-6436
Clyde Mitchell	Triton Environmental Consultants Ltd.	604-817-0905
Joan Chess	Fraser Basin Council	250-960-5827