Nicola Water Use Management Plan

(A water use management plan for the Nicola watershed)

March 2010

Executive Summary

Prepared on behalf of the:
Citizens of the Nicola Watershed

Prepared by:
Nicola WUMP Multi-Stakeholder Committee

With support from:
Compass Resource Management Ltd.

Compass Resource Management

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Our Vision

... a sustainable supply of quality water that ensures a balance of social, economic, traditional and ecological values.

Our Mission

... to guide the sustainable use of the water resources of the Nicola watershed in order to support the social, economic and ecological well being of our communities in perpetuity.

In the fall of 2004, the residents of the Nicola Watershed endorsed the development of a water use management plan to address issues related to water, fish flows and the Nicola dam. To guide the planning process, the residents agreed to the above vision and mission statement

Acknowledgements

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BC Federation of Fly Fishers

British Columbia Ministry of Environment

City of Merritt

Fisheries and Oceans Canada

Fraser Basin Council

Highland Valley Copper

Ministry of Agriculture and Lands, Integrated Land Management Bureau

Nicola Stock Breeders Association

Pacific Salmon Foundation – Fraser Salmon and Watershed Program – Living Rivers

Real Estate Foundation of British Columbia

Spences Bridge Steelhead Advocate Association

Steelhead Society of BC

Thompson Nicola Regional District

Watershed Watch Salmon Society

Private donors

Acronyms

ALR	Agriculture Land Reserve
BC	British Columbia
BMP	Best Management Practice
COM	City of Merritt
DFO	Fisheries and Oceans Canada
EFP	Canada – BC Environmental Farm Plan[1]
EMA	BC *Environmental Management Act*
FN	First Nation
GW	Groundwater
GWPR	BC Ground Water Protection Regulation (under the *Water Act*)
IFN / IFR	Instream Flow Needs / Requirements
IHA	Interior Health Authority
INAC	Indian and Northern Affairs Canada
ISWP	Integrated Source Water Program (for the City of Merritt)
IIABC	Irrigation Industry Association of British Columbia
LWS	BC's *Living Water Smart Plan (http://www.livingwatersmart.ca)*
MAL	Ministry of Agriculture and Lands
MLA	Member of BC Legislative Assembly
MO	Ministerial Order
MOE	Ministry of Environment
MSC	NWUMP Multi-Stakeholder Committee
NMP	Nutrient Management Plan
NTA	Nicola Tribal Association
NWAC	Nicola Water Advisory Council
NWCRT	Nicola Watershed Community Round Table
NWUMP	Nicola Water Use Management Plan
OCP	Official Community Plan
PSF	Pacific Salmon Foundation
QWD	Qualified Well Driller
SC	NWUMP Steering Committee (formerly known as the Planning Team)
SW	Surface Water
TNRD	Thompson Nicola Regional District
WL	Water License
WMP	Water Management Plan (under Part 4 of the *Water Act*)
WSC	Water Survey of Canada
WUMP	Water Use Management Plan

[1] A partnership between Agriculture and Agri-Food Canada, the BC Ministry of Agriculture and Lands and the BC Agriculture Council (for more information see http://www.bcac.bc.ca/efp_programs.htm).

Executive Summary

Without water there is no life. The quantity, accessibility and quality of water have a direct bearing on the health, well-being, prosperity and sustainability of a region's human, animal, and plant populations. As the number of people who call the Nicola watershed home continues to grow, and as the local economy expands to meet the needs of that growing population, there will be increased pressures on the available water resources. Increased competition for this vital natural resource will lead to conflict between various users if equitable 'rules of the game' are not developed. To avoid conflicts and to address existing and emerging water issues, residents of the Nicola watershed and others have developed a water use management plan.

On October 14-15 of 2004 the Nicola Watershed Community Round Table held a workshop in Merritt entitled *Charting Our Water Future*. The catalyst for the workshop was a series of events[2] associated with the drought of 2003. The workshop brought together a large and varied group of people who were interested in proactively addressing the ongoing water management issues that the region was experiencing. Following the workshop an inaugural meeting of what is now known as the Nicola WUMP (Water Use Management Plan) was held.

A four-phased planning process was adopted. Phases I and 2 have been completed. The evaluation by the community as part of Phase 3 has been completed. Opportunities were also provided for First Nations and all levels of government to provide feedback on the draft plan. In requesting meetings with First Nations, WUMP made it clear that these were not formal consultations and were without prejudice to title and rights. Phase 4 consists of implementing the plan and adapting it as new information is collected and assessed.

The main purpose of the plan is to, *"ensure that the future water supply will be divided equitably among all water users balancing the community's social, economic, traditional and ecological values".* In other words, the plan is meant to address critical water issues that have occurred or which are likely to occur in the immediate future. Some of the general issues instrumental in driving the development of a WUMP included:

- Insufficient water for both irrigation and fish (instream flow needs) during summer and early fall low flows;
- New zoning and land development pressures, in certain areas, have led to greater water demand and placed greater risk of insufficient water supplies being available to meet existing water uses.
- Inadequate groundwater controls or regulations, in place, which further threaten base flows in streams. Without some regulation, there is a loophole for persons wanting access to surface water (e.g. pending water license applications), as they could simply drill wells into

[2] The 2003 drought led to a heightened awareness about the consequences of low flows on fish populations and the potential impacts on water license holders (with fish clauses) who might be instructed to reduce their water use during critical periods. An announcement in March 2004 via a news release and subsequent front page article in the Vancouver Sun, also drew attention to the Nicola River as the most endangered river in British Columbia. The outlook for 2004 looked as though it could be another drought year in the Nicola watershed with potentially more years of low flows to come. The impact of these low flow periods on the agricultural sector, in particular, led to the Nicola Stockbreeders' Association initiating a process of strategic water management planning. A series of meetings were also called and chaired by then MLA, Dave Chutter, in May of 2004, to address a long outstanding issue - the Nicola dam - and to discuss a broader drought strategy.

the underlying aquifers without consideration of the resulting surface water effects[3] or potential interference effects on adjacent wells.

- In times of drought, surface water license holders can be asked to abide by regulatory requests for voluntary curtailments of water use or restricted water provisions can be imposed if fish clauses are associated with their licensed rights. These periods can impose significant economic hardships on the agricultural sector and threaten the livelihoods of farmers and ranchers.
- Poor water quality from land use practices has been raised as a major concern. It should be noted, however, that during the development of the WUMP, it became apparent that there was insufficient baseline data to evaluate policy instruments that would reduce the risk of contamination.

The planning process was structured around two main committees: the Steering Committee (SC, formerly the Planning Team) and the Multi-Stakeholder Committee (MSC). The SC provided organizational and technical support in between MSC meetings; the MSC was responsible for decision making during the plan's development. In addition, a number of sub-committees were formed to aid the MSC. The Nicola Watershed Community Round Table provided administrative and support services throughout the process.

During the WUMP planning process 26 objectives were agreed to which served as the foundation for the recommended policy instruments discussed in Section 6. In addition, a series of *Guiding Principles* were agreed to for 'how' the recommendations should be further developed and implemented. In all, ten *Guiding Principles* were agreed to, as follows:

1. *Recognize and promote the value of water, as it is a precious and limited resource.*
2. *Recognize the interconnection between surface and ground water throughout the watershed.*
3. *Recognize that water quantity and quality are required for healthy ecosystems and safe drinking water throughout the watershed.*
4. *Recognize and commit to integrated land and water use planning.*
5. *Recognize that water allocation and other management decisions need to be made in an open, transparent, and equitable way.*
6. *Promote and prioritize water efficiency through conservation and water storage.*
7. *Use the best available information to adaptively manage the WUMP.*
8. *Avoid costly and unsustainable conflicts tomorrow with timely and proactive investment today.*
9. *Recognize that everyone is affected and has a shared responsibility in water management: Active participation and information sharing are necessary in order to lead to more effective water management decisions.*
10. *Recognize and celebrate the achievements of the WUMP.*

[3] There is a regulation for new wells if their capacity exceeds 75 litres per second, which triggers an environmental assessment. There are very few examples of environmental assessments for new wells in the province.

WUMP Information Gathering

During the development of the WUMP, the MSC was actively collecting and sorting through relevant documents, thus expanding the information base to make wiser water management decisions now and into the future. Over $340,000 was spent on studies to address critical data gaps (see Section 4 for an annotated bibliography of the research that was drawn upon). A few highlights from the research are:

- Climate change is having a significant effect on the precipitation patterns and hydrology in the Nicola Watershed leading to dryer and more prolonged periods of low flows through the late summer and winter in some years. This trend will likely continue into the future.
- Groundwater discharge to surface water is the primary source of stream base flow. Any groundwater extractions and off-stream use (e.g. consumptive) in the Nicola Watershed will reduce downstream flows.
- Based on a water budget analysis of instream flow requirements for fish and water needed for off-stream use (e.g. irrigation), the Nicola Watershed as a whole has a net surplus of water in most years in terms of how much water is available (supply and storage) versus how much is needed to meet existing water demand. However, there is a timing and distribution challenge between when water is needed and when it is available. **During typical drought periods (1 in 10 year event), every sub-basin in the Nicola Watershed has a water deficit through the summer and fall (July to October) and therefore there is insufficient water to meet irrigation and instream flow requirements even when dam storage is factored in.** Despite the fact that over the next 10 years there may be slightly more water available as a result of the effects from the Mountain Pine Beetle infestation, this gain will be more than offset by rising demand. Therefore, the consistent and general trend will be **an increasing water deficit (in drought years) over the next 40 years** as there will be less water supply and greater water use unless action is taken.
- If a sub basin is at a water deficit, all upstream sub basins should also be considered to be at a deficit because of the critical contribution from those upstream sources.
- In order to properly assess potential changes at (or in the operation of) Nicola Dam, there are some critical data gaps which must be addressed first (e.g. potential impacts to the resident burbot population associated with fluctuating water levels).

WUMP and Nicola Dam

For more than 20 years, the completion of the Nicola Lake dam has been a contentious issue that despite numerous attempts to resolve, remains outstanding. The dam and its operations are seen as perhaps the most immediate and effective opportunity to address a number of long standing water availability issues in the watershed, if more storage or a shifting of flow releases from the dam were possible at certain times of the year. As a component to the WUMP, the MSC undertook a preliminary options assessment to explore potential changes at the dam (Section 5.3). **The outcome from that assessment (Appendix B) led to a recommendation for a more detailed trade-off assessment to be undertaken once critical data gaps had been addressed.** Some observations and highlights from the preliminary options assessment included:

- Everyone agreed that changes to Alternative 1 (which represented current Nicola Lake rule curves and minimum flow release requirements) should be explored in greater detail, as consensus on a preferred option at the dam seemed achievable across the multiple interests of the community.

- It was felt that changes at the dam could result in significant benefits – *increased irrigated land along the lake and downstream and improved fishery flows at key times.* Moreover, if some small physical works projects were undertaken[4], the benefits could be considerably more. While operations at the dam over the past few years have begun to make some of these operational changes, the MSC supported further work to evaluate the potential of these changes (see *Recommendations #20 and #21* in Section 6).
- There are key data gaps[5] which should be addressed in order to inform a more detailed options assessment and provide a higher degree of confidence when assessing impacts of current operations as compared to any proposed changes. In particular, a study to determine whether or not there are likely impacts on burbot was previously identified as one of the most important unresolved issues to address[6]. The MSC strongly endorsed a number of environmental studies to address these information gaps (*Recommendation #33*).

WUMP Recommendations

The identification, screening and ultimate selection of recommended policy instruments for the WUMP was a multi-step process carried out by both the SC and MSC.

The package of 37 policy instruments presented in the WUMP were endorsed and recommended by consensus by the MSC. They were grouped into five main categories: water quantity, water quality, environment, learning, and management. The focus of the policy instruments was on ***water quantity***: to conserve and better ensure the adequacy and availability of water supplies both in terms of **demand management** and ***increased storage potential*** [7]**.** There were a couple of reasons for this:

- water shortages were fairly well understood at the initiation of the planning process; and
- there was a high level of awareness in the community about water shortage conflicts. Given recent climate change effects and land development pressures, the competition for and potential for conflicts around water availability was expected to increase; and, any decrease in water use would have a corresponding benefit to all other water interests including the environment.

Costs for the recommended policy instruments were crudely estimated. The purpose of approximating costs was to provide a relative comparison between the instruments. Total costs to implement the WUMP – *averaged over the first ten years* – works out to about $600,000/year in 2009 dollars using a 5% discount rate. On a per capita basis for the residents living in the Nicola Watershed, total costs work out to about $20 per person per year assuming a 50-50 cost sharing arrangement between the province and the residents of the region to implement the

[4] For example, limited dredging, consideration of groundwater pumps below the dam to augment river flows, pump intake modifications along the lake, etc.

[5] Burbot, kokanee, and rainbow trout spawning and rearing habitat impacts, tributary migration issues, wildlife impacts associated with staging and nesting areas, fish passage issues, pump intake issues associated with lower lake levels, water quality issues associated with lower lake levels, water level effects associated with Upper Nicola Band's infrastructure facilities, and potential aquifer effects associated with a new groundwater pump to augment river flows at certain periods.

[6] Urban Systems. March 2006. *The Completion of the Nicola Lake Dam Project: Technical Feasibility Study.*

[7] A number of storage related recommendations are associated with the WUMP, including: #9 – unused portions of WLs; #19, #20, & #21 – related to Nicola dam; #22 – all dams; #23 – potential new dams; #24 – use of cisterns; and #33 – storage sites and groundwater storage study.

plan (Note. This assumes no contributions from businesses which would also benefit from the plan).

Actual costs will be largely dependent on how implementation occurs within the lead agencies, cost sharing arrangements between the federal, provincial and local governments, grant application success for some of the eligible instruments, to what degree some of the instruments are carried out under the LWS strategy, the governance model that ultimately gets established, and to what degree community residents and businesses are willing to pay for more effective water management and more secure water rights that they will benefit from.

It is hard to demonstrate the value of the WUMP in terms of a cost benefit analysis because many of the social and environmental benefits are hidden or are hard to monetize. Having said this, the implementation of the WUMP is anticipated to have a number of significant benefits, for example:

- Avoided legal costs associated with water disputes and environmental appeals;
- Improved supply of irrigation water during critical periods (i.e. lessening the risk of fish clauses being triggered for some water licensees) and potentially allowing for more irrigated lands;
- Improved water conditions to meet instream flow requirements for fish and wildlife;
- Improved water supply to support local economic development and growth;
- Reduced contamination risks to aquifers and fish-bearing streams;
- Improved education and public awareness to better conserve and protect water supplies;
- Increased social benefits associated with water-based recreation, fishing and wildlife viewing opportunities;
- Increased flexibility and knowledge to adapt to changing climatic conditions in the watershed; and
- Improved baseline data and information to assess the effectiveness of policy instruments for better water management in the future.

The sequencing for when the recommended policy instruments should be started was influenced by taking a staged approach. For the most part, lower cost instruments that were associated with a high potential of public support were proposed earlier. Other potentially more costly or controversial instruments were more dependent on the results from the proposed monitoring and study program. Accordingly, the implementation of the instruments associated with larger trade-offs was delayed until better information was available and could be assessed during the WUMP review (i.e. year 5). It is noted that many of the policy instruments have been logically tied to the recommendations in the Living Water Smart, British Columbia's water plan.

Table 1 summarizes the package of recommended policy instruments; includes a recommended schedule for when the instruments should be started; and provides a relative cost comparison for the implementing agencies.

Monitoring, learning and adapting to new information is a core and guiding principle for the Nicola WUMP. Effective water management needs to adapt to new conditions, changing values and better information. The WUMP is considered a living plan which needs to be periodically reviewed and updated. Based on the proposed monitoring and research activities identified in this draft plan, it is recommended that a full review take place within 5 years of the WUMP being implemented.

Table 1 - Summary of WUMP Recommendations (For a full explanation and rationale for each of the recommendations, please refer to the body of the report beginning on page 44.)

Objective	*Location*	#	*Recommended Policy Instrument*	*Targeted at*	*Implemented through*	*Begin in Year*	*Approx Costs*[8] *Low < ~$25K /yr Med < ~$70K /yr High > ~$70K /yr*
General	Nicola Watershed	**1**	• ***Initiate and implement a Water Management Plan for the Nicola Watershed under Part 4 of the Water Act***	All Sectors	MOE	**1**	**Depends**
Water Quantity	All Areas	**2**	• ***Enhance public education and outreach program***	All Sectors	COM / TNRD Prov / Fed / FNs	**3**	**Med**
	All Areas	**3**	• ***Initiate a staged conservation initiative, which may include installing and reading flow meters and reporting usage on an annual basis***	All Sectors	COM / TNRD Prov / Fed / FNs	**3**	**High**
	All Areas	**4**	• ***Mandate drilling authorizations for new water supply wells***	Well Owners / Drillers	MOE / DFO (fish impacts) / Possibly INAC	**3 - 5**	**Med**
	All Areas	**5**	• ***Work towards the implementation of a water licensing system for all new water supply wells***	All Well Owners	MOE	**10**	**Low**
	All Areas	**6**	• ***Support condition of no new permanent water licenses unless backed by storage***	WL Applicants	MOE	**0**	**Nil**
	All Areas	**7**	• ***Harmonize surface water allocations/licenses with groundwater use/demand/licenses***	WL Holders	MOE	**5**	**Med**
	All Areas	**8**	• ***Ensure that all provincial and federal infrastructure grants are contingent on water metering***	Local Gov'ts / Agriculture	MCS (BC) / Fed (Ag Canada)	**3**	**Nil**
	All Areas	**9**	• ***Seek opportunities to renegotiate and hold in reserve unused portions of water licenses***	WL Holders	MOE	**5**	**Low**

[8] Costs are approximate at this point and are only intended to give a general sense of the relative costs of the proposed policy instruments. The cost categories (high, medium and low) are arbitrary and were set to show differences between the policy instruments. Annual costs are averaged over a 10 year period and depend on the year the policy instrument begins. The costs include upfront and ongoing costs to the implementing agency. Costs are in 2009 dollars with no discount rate being applied.

Objective	*Location*	*#*	*Recommended Policy Instrument*	*Targeted at*	*Implemented through*	*Begin in Year*	*Approx Costs*[8] *Low < ~$25K /yr Med < ~$70K /yr High > ~$70K /yr*
	All Areas	**10**	• ***Update land use plans to be consistent with WUMP goals and objectives***	New Developments	TNRD / COM / MOFR / FNs / etc.	**5**	**Nil**
	All Areas	**11**	• ***Implement a new by-law for facilitating grey water systems and any needed regulatory changes***	New Developments / Major Renos	TNRD / COM / Prov / IHA	**4**	**Nil**
	All Areas	**12**	• ***Recommend new by-laws and development permit requirements to better conserve water supplies***	New Developments / major renos & retrofits	TNRD / COM	**4**	**Low**
	All Areas	**13**	• ***Implement a graduated summertime sprinkling restriction system***	Non-Agriculture	COM / TNRD Prov / Fed / FNs	**3**	**Low**
	All Areas	**14**	• ***Implement a rebate program encouraging water conservation***	All Sectors	COM / TNRD	**5**	**Low**
	All Areas	**15**	• ***Develop an integrated drought management plan***	All Sectors	MOE / NWAC / COM / TNRD	**1**	**Low**
	All Areas	**16**	• ***Develop a program to identify and cap free flowing artesian wells***	Well Owners	MOE	**4**	**Low**
Water Quantity	All Areas	**17**	• ***Encourage more efficient irrigation systems***	Agriculture	Ministry of Agriculture / MOE	**3**	**Low**
	All Areas	**18**	• ***Support LWS's requirement for mandatory purple pipes in new construction by 2010***	New Developments	MOE / IHA	**0**	**Nil**
	Nicola Dam	**19**	• ***Initiate periodic and planned communication meetings between WUMP Advisory Council, stakeholders, and MOE dam operators***	All sectors	MOE / NWAC	**1**	**Low**
	Nicola Dam	**20**	• ***Undertake a detailed options assessment to find a preferred management solution***	All sectors	MOE / DFO / NWAC	**3 (ASAP)**	**Med**
	Nicola Dam	**21**	• ***Initiate an aquatic ecosystem study associated with lake level changes in Nicola Lake (and downstream)***	All sectors	MOE / DFO / NWAC	**1**	**Low**
	All Dams	**22**	• ***Recommend a review of the operations for Mamit Lake and all other existing small dams***	All sectors	MOE / NWAC	**5**	**Low**

Objective	*Location*	#	*Recommended Policy Instrument*	*Targeted at*	*Implemented through*	*Begin in Year*	*Approx Costs*[8] *Low < ~$25K /yr Med < ~$70K /yr High > ~$70K /yr*
	All Areas	**23**	• ***Revisit and identify potential new storage dams given water deficit***	Crown Land / Private Land	MOE / NWAC / Property Owners	**4**	**Low**
	All Areas	**24**	• ***Explore potential program to encourage use of cisterns to store rain water***	All sectors	MOE / COM / TNRD / IHA	**3**	**Low**
Water Quality	All Areas	**25**	• ***Encourage farms to undertake nutrient management plans (NMP)***	Feedlots / Winter Feed Grounds / Dairy Farms	Ag Canada / Province	**3**	**Low**
	All Areas	**26**	• ***Encourage agriculture, mining, and other industries to adopt best management practices around water use and conservation***	Agriculture	BC Ag Council / MEMPR / MOFR	**4**	**Low**
Environment	All Areas	**27**	• ***Support ongoing enhancement initiatives***	All sectors	DFO / MOE / FNs / COM / TNRD / NWAC	**1**	**Nil**
	Nicola Dam	**28**	• ***Develop a Fish - Water Management Tool***	All sectors	DFO / MOE / NWAC	**6**	**High**
	Priority Areas	**29**	• ***Develop suitable riparian setback requirements for new water supply wells in priority areas***	Well Owners / Drillers	MOE ➔ Drilling Authorizations	**4**	**Low**
	All Areas	**30**	• ***Ensure that Instream Flow Needs are taken into account within any harmonized surface and groundwater licensing system***	WL Applicants / Holders	MOE / DFO	**7**	**Low**
Learning	All areas	**31**	• ***Prepare bi-annual report on the state of water in the watershed and the effectiveness of the WUMP***	Everyone	MOE / NWAC	**3**	**Med**
	All Areas	**32**	• ***Develop a monitoring program to better determine baseline conditions for water quantity and quality trends including climate change adaptation***	Everyone	MOE / EC (WSC) / NWAC	**3**	**High**

Objective	*Location*	#	*Recommended Policy Instrument*	*Targeted at*	*Implemented through*	*Begin in Year*	*Approx Costs*[8] *Low < ~$25K /yr Med < ~$70K /yr High > ~$70K /yr*
	All Areas	**33**	• ***Undertake specific studies*** *A. Contaminant Inventory* *B. Nicola Lake Aquatic Impact Study* *C. Complete Preliminary Instream Flow Needs* *D. Detailed IFN Assessment in Priority Areas* *E. Groundwater Storage Study* *F. Detailed Water Budget* ***G.** Storage Sites Assessment*	Everyone	MOE / DFO / Env Canada (WSC) / IHA / NWAC	**1 - 5**	**High** (combined)
Management	All Areas	**34**	• ***Establish a community driven governance system to inform water management systems***	FNs & Stakeholders & Regulators	MOE / NWUMP	**1**	**Med**
	All Areas	**35**	• ***Create secure and stable funding sources to support water management activities***	Grants / regulators / water users	NWAC	**1**	**Med**
	All Areas	**36**	• ***Support a compliance and enforcement system for monitoring activities associated with the delivery of the WUMP***	Regulators	MOE / Local Governments / Regulators	**3**	**Nil**
	All Areas	**37**	• ***Review the WUMP at a 5 yr review (or before) as required***	All Sectors	MOE	**5**	**Low**