

From: Tanja McQueen [mailto:tmcqueen@bcwwa.org]
Sent: Thursday, November 14, 2013 6:28 PM
To: Living Water Smart ENV:EX
Cc: Jennifer Crosby (jennifer.crosby@metrovancover.org)
Subject: BCWWA comments on the Legislative Proposal for the Water Sustainability Act

Please find attached a summary of the comments from the BC Water & Waste Association regarding the Legislative Proposal for the *Water Sustainability Act*. Thank you for the invitation to provide comment. Our Association members are eager to see the Act move forward, and we commend the Ministry of Environment for its efforts to engage organizations like ours to provide input into decisions about our most important natural resource, water.

Best regards,

Tanja McQueen
Chief Executive Officer

BC Water & Waste Association

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Safeguarding public health and the environment through the sharing of skills, knowledge, education and experience, and providing a voice for the water and waste community.

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Ministry of Environment
PO Box 9047
Stn Prov Govt
Victoria, BC V8W 9E2

Sent by email to: livingwatersmart.gov.bc.ca

Attention: Honourable Minister Polak

RE: LEGISLATIVE PROPOSAL FOR A WATER SUSTAINABILITY ACT FOR BC

Dear Ms. Polak,

The BC Water and Waste Association (BCWWA) is pleased to provide further comments on the development of a new Water Act for BC. The following comments have been prepared by the BCWWA in response to the legislative proposal “A Water Sustainability Act for BC” (WSA) released on October 18, 2013. Our comments include references to BCWWA’s previous submission titled “*Modernizing BC’s Water Act – Responding to current realities. Setting the future course*” dated April 30, 2010 (refer to Appendix A).

BCWWA is an industry association representing more than 4,700 water practitioners in British Columbia, including operators, engineers, utility managers, suppliers, and government. Our members are responsible for ensuring safe, sustainable, and secure water systems that protect public health and the environment.

BCWWA has reviewed the latest WSA proposal and congratulates the Ministry on the progress that staff has made. We noted that four of the seven overarching recommendations and all four of the goal-specific recommendations in our 2010 submission are included in the WSA. We are pleased to see the progress on:

- Regulating groundwater extraction and use
- Protecting stream health and aquatic environment
- Investing resources for surface water and groundwater management in priority areas
- Measure and report provisions
- License term review period

The following comments reference the seven **overarching recommendations** in our 2010 submission and the proposed content in the WSA.

1. **First in time, First in right (FITFIR):** BCWWA reiterates our initial recommendation from our 2010 submission regarding abandoning the FITFIR approach to water allocation priorities and replacing it with priorities based on the **value of the water use**. A priority system based on a hierarchical list of water uses, with the highest value of use having priority, would allow the Ministry to manage the water resource in a much more effective manner than is currently available under FITFIR. While BCWWA recognizes that FITFIR is a simple system and easy to understand, it does not reflect today’s needs where access to water should be based on its value

especially during times of scarcity. If the Province is not prepared to replace FITFIR for surface water licences it should **not expand the use of FITFIR** to groundwater.

2. **Groundwater:** BCWWA supports the proposal to regulate groundwater extraction and use. We request that the BCWWA be kept informed by the Ministry when it proposes to commence with the development of the new groundwater regulation(s) as our members have considerable expertise in this area and are prepared to provide technical support to assist the Ministry in the development of the regulation(s).
3. **Ministry control:** BCWWA supports the proposal that “Ultimate responsibility for environmental protection would remain with the provincial government.” BCWWA does not agree that Environmental Flow Needs (EFNs) should be discretionary – under any circumstance. Our members strongly support “measuring and reporting actual water use when demonstrating compliance with water licence conditions”. It is recommended that the Ministry review our position statement titled *Reporting of Water Withdrawals* that is provided in Appendix B. BCWWA remains convinced that a fundamental component of environmental protection is maintaining EFNs and that includes accurate reporting of actual water use (surface and groundwater).
4. **Protecting priority stream and aquifers:** BCWWA supports the proposed initiatives in the WSA regarding the protection of priority streams and aquifers from adverse impacts from land use; however, the intent must be to use the knowledge and experience gained from addressing priority systems to **expand protection to all** streams and aquifers.
5. **Management:** The Ministry’s priorities for managing surface and groundwater should include more than issues of scarcity and contamination. BCWWA recommends that a priority should be managing the water resource based on its **value of use**. Refer also to our FITFIR comments. BCWWA recommends that **all** groundwater use be licensed, but only the larger users be regulated. If the Province licenses and regulates only “large users,” small individual users may be detrimentally impacted and have no recourse.
6. **Outcome-based policies:** BCWWA supports the Ministry’s intent to develop outcome-based policies as described in the proposal.
7. **Ministry resources:** The Ministry acknowledges in the proposal that the current revenue from its fees and water rentals (excluding revenue from BC Hydro) do not cover the costs of administering the program. As stated in our 2010 submission, BCWWA urges the government to increase resources for administration of the WSA, including water quantity and quality monitoring and reporting, with **full cost recovery** through **increased fees and water rentals** for all licensed consumptive use of surface and ground water.

Regarding BCWWA’s **goal specific** recommendations in our 2010 submission:

To **Improve Water Governance Arrangements**, BCWWA again recommends that government:

1. Coordinate and simplify water governance legislation.
2. Maintain provincial authority over water (centralized approach), but introduce a comprehensive consultative approach for water management at the regional level, with increased focus on priority areas.

3. BCWWA anticipates the WSA will not trigger consequential amendments to other legislation. Please consider how inter-ministry communication and potentially competing mandates will be addressed.
4. Create a “front counter” for water to provide an effective interface between government and water users.
5. Recover the full cost of administering the WSA by increasing fees and water rentals for consumptive use of surface and ground water licenses.

Comments on new items in WSA proposal

Water Sustainability Plans: Water Sustainability Planning is a new term introduced in the proposal but the details are lacking. The idea is not new and it appears that these Plans may be similar to watershed management planning. BCWWA has prepared a position statement - *Watershed Management Planning* that we suggest the Ministry review. A copy is provided in Appendix C.

It is not clear how Water Sustainability Plans would link with other plans such as the Source Protection Plans and Drought Response Plans, etc. BCWWA has concerns regarding: plan scope, who will enforce the plan, and how the plans will be paid for. We encourage the Ministry to include quantity, quality and timing of flow in the Plans. Water for agriculture could have a high value that would likely allow for assigning it a high priority in a Water Sustainability Plan. We recognize that the details will likely be developed after the WSA is in place. In this regard, BCWWA offers its support in developing the regulations that would enable Water Sustainability Plans.

BCWWA is encouraged by the content in the legislative proposal for a Water Sustainability Act for BC. It is clear from the content in the proposal that the Ministry listened to the comments from the BCWWA and others. We appreciate the opportunity to offer our comments on the current proposal and look forward to the WSA becoming a reality next year.

BCWWA represents a very extensive and diverse group of water industry experts and offers its assistance to the Province in the development of the regulations. We ask that we be kept informed on the progress in drafting the new Act and also that we be advised when the Ministry begins to draft the regulations. Our members have extensive experience in applying the current regulations and are prepared to assist in drafting the new regulations.

Sincerely,



Jennifer Crosby
Board President
BC Water & Waste Association

Appendix A

BCWWA's 2010 Response to *Modernizing British Columbia's Water Act*

Modernizing BC's Water Act

*Responding to current realities.
Setting the future course.*



Water Act Modernization submission to

**Parliamentary Secretary for
Water Supply and Allocation**



BCWWA
BRITISH COLUMBIA WATER & WASTE ASSOCIATION

April 30th, 2010

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SYNOPSIS of BCWWA RECOMMENDATIONS

The British Columbia Water & Waste Association (BCWWA) was established in 1973 to serve the water and waste community in BC and Yukon. Its mission today is two-fold — to safeguard public health and the environment through the sharing of skills, knowledge, education and experience, and to provide a voice for the water and waste community.

Our collective voice is strong in its response to the province’s call for input regarding the modernization of BC’s *Water Act*. More than 200 members representing a broad cross-section of the BCWWA’s water and waste community responded to a recent survey that gauged opinion about the existing act and gathered suggestions for updating it. Findings were subsequently reviewed and analyzed by an adhoc committee including BCWWA board members and industry experts. The resulting messages are reflected in the text of this document, and outline BCWWA’s recommendations for responding to current realities and for setting the future course for water management in BC.

OVERARCHING RECOMMENDATIONS

1. BCWWA recommends the province abandon the First-in-Time, First-in-Right (FITFIR) approach to water allocation, and replace it with surface water and groundwater allocation decisions based on the relative **value** of water for various uses. To ensure consistency throughout the province, the new *Water Act* should outline the water allocation planning **process** needed to effectively determine the value of water in each watershed/aquifer.
2. BCWWA recommends that surface water and groundwater be considered and managed together as one resource and where applicable on a watershed basis.
3. BCWWA recommends the province retain full responsibility for administration of the *Water Act* (centralized approach), but adopt a more comprehensive consultative approach for water management decisions at the regional level.

4. BCWWA recommends that, through appropriate legislation, priority streams and aquifers be protected from individually or cumulatively significant adverse impacts of upland development or land use, in terms of both water quality and quantity.
5. BCWWA recommends that the province invest its resources for surface water and groundwater management in priority areas first (including known areas as shown in Figure 4F of the *Water Act* Modernization Technical Background Report), based on specific factors such as scarcity or contamination.
6. BCWWA favours outcome-based policies, but for stream health and allocation decisions, recognizes the need for supporting criteria, guidelines, and in some cases, enforceable standards and prescriptive regulations that can be easily updated as better information becomes available.
7. BCWWA recommends increasing resources for administration of the *Water Act*, including water quantity and quality monitoring and reporting, with costs recovered through increased fees for consumptive use licences only.

GOAL-SPECIFIC RECOMMENDATIONS

Protecting Stream Health and Aquatic Environments

1. Expand the scope of stream health provisions in the *Water Act* to include groundwater
2. Coordinate and simplify provincial stream protection regulations
3. Consider environmental flows in all water allocation decisions
4. Recognize, in appropriate legislation, the cumulative impacts of land use on surface water and groundwater quality and quantity, including return flows

Improving Water Governance Arrangements

1. Coordinate and simplify water governance legislation
2. Maintain provincial authority over water (centralized approach), but introduce a comprehensive consultative approach for water management at the regional level, with increased focus on priority areas

3. Create a “front counter” for water to provide an effective interface between government and water users
4. Recover the full cost of administering the *Water Act* by increasing fees for consumptive use licences only

Introducing More Flexibility and Efficiency in the Water Allocation System

1. Abandon the practice of First in Time, First in Right (FITFIR) for all new water licences, and phase out FITFIR for existing licences over time
2. Allocate water based on the relative value of water for various uses within a watershed or aquifer as determined by key stakeholders and other water users
3. Invest resources for surface water and groundwater management in priority areas first, based on specific factors such as scarcity or contamination.
4. Strengthen accountability requirements for existing licenses
5. Promote water-use efficiency through codes for infrastructure and practice
6. Establish certain permitted uses supported by provincial regulation and regional flexibility

Regulating Groundwater Extraction and Use

1. Consider and manage surface water and groundwater together as one resource
2. Implement Phase II of the Groundwater Protection Regulation
3. Require registration for all wells
4. Require licensing of high-volume wells, and of other wells in priority areas as determined by a water management plan

PRINCIPLES UNDERLYING THE *WATER ACT*

As outlined in the discussion paper, the following principles are intended to respond to current water management realities and to reflect modern expectations for stream health and water security. BCWWA supports these principles, as indicated by the findings of a recent member survey (level of support shown in percentages at right).

1	BC's water resources are used within sustainable limits.	90%
2	First Nations' social and cultural practices associated with water are respected and accommodated.	50%
3	Science informs water resource management and decision-making.	83%
4	Water resource legislation, policy and decision-making processes as well as management tools are integrated across all levels of government.	91%
5	Rules and standards for water management are clearly defined, providing a predictable investment climate across the province.	86%
6	Flexibility is provided to adapt to extreme conditions or unexpected events on a provincial, regional or issue-specific level.	85%
7	Incentives are created for water conservation that consider the needs of users and investors.	79%
8	Rights to use water come with responsibilities to be efficient and help protect stream health.	95%

GOALS SHAPING *WATER ACT* MODERNIZATION

The following goals, as outlined in the discussion paper, are intended to engage stakeholders in dialogue about key water management issues, and, ultimately, to shape the scope and vision of *Water Act* modernization. BCWWA responses to the goals are as follows:

GOAL 1: Protecting Stream Health and Aquatic Environments

BCWWA RECOMMENDATIONS

1. Expand the scope of stream health provisions in the *Water Act* to include groundwater

BCWWA believes that the scope of stream health should be expanded to include groundwater, as groundwater and surface water are interconnected. A significant proportion of base flow in streams is fed from aquifers, and water from streams feeds aquifers. Groundwater quality and quantity should be subject to the same protections as that of surface water.

2. Coordinate and simplify provincial stream protection regulations

Existing stream health and aquatic environment legislation — fragmented among many provincial acts and regulations — is confusing and cumbersome. BCWWA recommends this legislation be coordinated and simplified by facilitating a process during which affected ministries and agencies collaborate to identify and implement more streamlined and user-friendly approaches.

3. Consider environmental flows in all water allocation decisions

A modernized *Water Act* should be proactive rather than reactive. To that end, BCWWA recommends that, through appropriate legislation, priority streams and aquifers be protected from individually or cumulatively significant adverse impacts of upland development or land use, in terms of both water quality and quantity. The *Water Act* currently focuses on ‘adequate water flows,’ protecting habitat and reducing water quality impacts. A new act should make it illegal for any person to pollute a water body or aquifer, and place responsibility for the full cost of remediation on the polluter. Landowners should be responsible for avoiding or mitigating adverse impacts on priority water resources such as increased runoff volume and peak flow rates, reduced base flows and aquifer recharge, and water quality degradation due to use or development of their land. Criteria would be needed to define a priority stream or aquifer.

4. Recognize, in appropriate legislation, the cumulative impacts of land use on surface water and groundwater quality and quantity, including return flows

It is acknowledged that the relationship in provincial statutes and regulations between land use and water resources is complex, and implementing this recommendation may fall outside the scope of *Water Act* modernization. However, there is currently no clear and consistent framework for protecting streams and aquifers from upland development or use. For water quality and quantity to be effectively managed in the interconnected systems of streams and aquifers, either the *Water Act* prohibition of dumping would need to be greatly expanded, or other statutes and regulations would be required. In either case, a high degree of collaboration with other agencies, particularly local governments, would be required to implement measures to reduce land-use impacts on water resources.

BCWWA MEMBERS' VIEWS

Of the 207 BCWWA members who completed the survey, about half answered the stream health and aquatic environment questions. They said “yes” to the following —

Impacts on stream health from land and resource development should be prevented and, where necessary, mitigated	94%
Environmental flows should be considered in all water allocation decisions	90%
The <i>Water Act</i> should be amended to require that people who dump harmful substances into streams be held responsible for restoring stream health	85%

GOAL 2: Improving Water Governance Arrangements

BCWWA RECOMMENDATIONS

1. Coordinate and simplify water governance legislation

BCWWA believes that existing water governance legislation is fragmented and, therefore, confusing. With water being governed by more than 50 provincial acts and regulations, even people working within the water industry have difficulty understanding water governance. Hence, the BCWWA believes strongly that water governance in BC should be simpler, better coordinated, and more transparent. BCWWA also proposes that the *Water Act* be made the

overarching go-to legislation on water that references, where appropriate, elements that will remain within other provincial and federal acts and regulations.

2. Maintain provincial authority over water (centralized approach), but introduce a comprehensive consultative approach for water management at the regional level, with increased focus on priority areas

BCWWA believes that ultimate responsibility for water governance should be held by the province (centralized approach), and not delegated to any other government or agency. However, within that framework, we also believe the province could adopt a comprehensive consultative approach for water management at the regional level. This approach should be flexible and adaptable so that the greatest efforts are placed on the highest-priority areas, particularly in times of greatest need (e.g., water scarcity or water quality risks). For example, regional authorities such as the Okanagan Basin Water Board and the Islands Trust could become much more active in supporting the provincial management of water legislation in their areas, particularly during times of scarcity. Given the unique characteristics of each basin, this approach would help key stakeholders focus on challenges specific to their areas. To be effective, this approach must ensure clarity, coordination and consistency among all levels of government for land-use and water-use decisions that reflect best practices. The process must recognize that we live in a changing environment that requires rapid adaptation. Effective consultation will require increased investment in educating water users about the value of water, so they can contribute meaningfully to decision-making processes.

3. Create a “front counter” for water to provide an effective interface between government and water users

BCWWA supports the creation of a “front counter” for water to provide an effective interface between government and water users. This front counter would be the go-to place for information about water governance in BC, and provide referrals to other ministries and agencies where specific expertise resides.

4. Recover the full cost of administering the *Water Act* by increasing fees for consumptive use licences only

BCWWA understands that these changes in water governance will require a large investment in human and financial resources, at both the provincial and regional levels. The cost of these investments should be covered by appropriate increases in fees for all consumptive water licenses. To that end, the BCWWA supports increased license fees and a more aggressive, user-pay approach to water pricing.

BCWWA MEMBERS' VIEWS

About 60% of survey respondents answered the water governance questions. They have encountered the following water governance challenges —

A lack of coordination between different government agencies	72%
Inconsistent and overlapping enforcement of regulations	63%
Inconsistencies in water legislation and the longevity of water policies and priorities	60%
Difficulty influencing land- and water-use decisions to protect water quality	60%

More than half of respondents believe there is a lack of adequate water management legislation and regulations, and a lack of transparency in decision-making for water-use plans and licences. To address these concerns, members support —

Better coordination across all levels of government and with all major watershed stakeholders	87%
Better definitions of authority, roles and accountability at all levels	78%
Increased flexibility to respond promptly to changing needs and values	75%

Regarding provincial responsibility, members want the following —

Increased responsibility at all levels	50%
Current levels of responsibility at all levels	20%
Lower levels of responsibility at all levels	15%

Members who support increased provincial responsibility identified four priority areas —

Compliance and enforcement	77%
Drought and flood response plans and policies	74%
Integrated regulations of connected groundwater and streamwater	74%
Allocation planning and licensing of both groundwater and surface water	68%

Regarding the “shared approach” to water governance, members support the following —

Regional visioning and watershed planning	89%
Watershed restoration plans and policies	85%
Public education and outreach activities	85%
Drought and flood response planning	83%
Formal opportunities to influence land-use and resource-management planning	81%
Watershed health reporting	80%
Compliance and enforcement	77%
Water allocation planning and licensing	76%
Oversight over transfer or extension of water rights	69%

GOAL 3: Introducing More Flexibility and Efficiency in the Water Allocation System

BCWWA RECOMMENDATIONS

1. Abandon the practice of First in Time, First in Right (FITFIR) for all new water licences, and phase out FITFIR for existing licences over time

First in Time, First in Right water allocation is a product of a time in history when North American resources seemed boundless compared to the populations that relied on them. BCWWA believes the FITFIR is no longer appropriate in BC because it does not provide the flexibility to respond to changing circumstances — including climate change and changes in stream flows caused by land-use changes — and because streams are already over-allocated in several areas of BC. All existing water licences should be subject to a fixed renewal date. The renewal of a licence would provide an opportunity to amend the licence, where appropriate, based on a priority-of-use framework that reflects input from key stakeholders and other water users.

2. Allocate water based on water-specific values at a water and aquifer level

BCWWA recommends the integrated allocation and regulation of surface water and groundwater based on relative value (priority of use), as determined by key stakeholders and other water users. Relative value is determined by comparing the needs of various uses and users, and ranges from the spiritual importance expressed by First Nations, to the stream flows required by fish, to the economic benefits expected by hydro-electric producers. The future allocation of water should be based on an established hierarchy of water values within each watershed/aquifer. A robust, province-wide framework is needed to clearly define the valuation process, and to set bounds on the range of valued uses. Dialogue among watershed/aquifer stakeholders and other water users would explore allocation issues specific to their area. Discussion would focus on the value of water in the region, equitable distribution of water uses, long-term monitoring and management strategies, and the tools needed to support the resulting water allocation plan. These plans, required initially in priority areas, would also set terms on **all** water licences, which would guarantee opportunities for review and amendment of all licences over time.

For short-term water scarcity, BCWWA supports a shared (proportional reduction) approach that recognizes and rewards water efficiency. For long-term shortages, the association supports a collaborative, community-driven approach that goes beyond supply and demand side management. Allocation should be based on priority of use within a framework established by the province, in consultation with local government and other stakeholders. The priority-of-use hierarchy currently established in the *Water Act* (for licenses having the same date: domestic, waterworks, mineral trading, irrigation, mining, industrial, power, hydraulicking, storage, conservation, conveying and land improvement) requires revision. In priority areas and aquifers, environmental flow should be the top priority.

Neither the discussion paper nor the technical background report explicitly addresses the issue of managing water during times of scarcity. Many jurisdictions have adopted or are contemplating a “water market” to allow for either temporary or permanent transfer of water rights. BCWWA

believes that such a tool might have a place in BC. However, careful consideration is needed to ensure that economic priorities don't trump the social and environmental priorities of watersheds and aquifers. To determine the suitability of this approach in BC, BCWWA suggests the province conduct research to answer the following questions: Who is using which licences and how? How much of their allocated water are licensees actually using? Should licences be temporarily or permanently transferable? If so, to whom and for what use? And for what period of time? Answers to these questions could be used to develop market-based solutions during water scarcity, particularly in drought-prone areas.

3. Invest resources for surface water and groundwater management in priority areas first, based on specific factors such as scarcity or contamination

BCWWA recommends the province invest its resources for surface water and groundwater management in priority areas first (including known areas as shown in Figure 4F of the Technical Background Report), based on specific factors such as scarcity or contamination.

4. Strengthen accountability requirements for existing licences

BCWWA recommends the province strengthen accountability requirements for existing licensees, particularly the requirement to accurately measure and report actual surface water and groundwater use and groundwater levels in regulated wells.

5. Promote water-use efficiency through codes for infrastructure and practice

BCWWA recommends the promotion of efficient water use primarily through codes for infrastructure and practice, supported by economic incentives, and enabled by regional flexibility in the application of regulation for efficient administration.

6. Establish certain permitted uses supported by provincial regulation and regional flexibility

BCWWA recommends the province establish certain permitted uses (not requiring a license), subject to provincial regulation with regional flexibility based on risk or through water allocation plans.

BCWWA MEMBERS' VIEWS

About half of respondents answered the water allocation questions. Their support is as follows —

Improve decision times and enforcement by measuring and reporting of actual water use when demonstrating compliance with licence conditions	87%
Integrate surface water and groundwater through surface water allocation and groundwater regulation based on priority of use (vs. 15% support for FITFIR)	85%
Encourage administrative efficiency by defining permitted uses, but allowing flexible application of regulations across the province based on risk or through water-use plans (favoured more than 2:1 over uniform province-wide regulation, or voluntary or mandatory self-registration of withdrawals)	83%
Abandon FITFIR for new licences	82%
Address long-term scarcity through collaborative planning with community engagement (vs. 29% support for mandatory Water Management Plans as per Section 4 of the <i>Water Act</i>).	71%
Encourage water efficiency by establishing and enforcing codes for efficient infrastructure and practices (favoured more than 2:1 over tying licences to efficient practices or reviewing rules for transferring or apportioning existing rights)	52%
Improve decision times and enforcement through the self registration of wells	51%
Address temporary water scarcity through proportional reduction in use by all users (vs. 2% support for FITFIR)	49%
Abolish FITFIR for existing licenses	44%

GOAL 4: Regulating Groundwater Extraction and Use

BCWWA RECOMMENDATIONS

1. Consider and manage surface water and groundwater together as one resource

Surface water and groundwater are inextricably linked. Aquifers provide base flows for streams, and surface water bodies recharge aquifers. Both quality and quantity of surface water and groundwater are connected, yet only surface water is truly regulated and managed in BC. With current knowledge and information systems, groundwater can also be cost-effectively measured and managed together with surface water as part of an integrated hydrologic cycle.

2. Implement Phase II of the Groundwater Protection Regulation

BCWWA recommends the Water Stewardship Division be adequately resourced to complete the development of the Phase II Regulation that is required for effective monitoring and enforcement.

3. Require registration for all wells

BCWWA believes that all wells should be registered with the province, including the provision of a provincial identification plate and the filing of well drilling logs and testing data in the MoE WELLS Database. Submission of well data is currently voluntary, and only about half of the wells in BC are currently identified in the database.

4. Require licensing of high-volume wells, and of other wells in priority areas as determined by a water management plan

BCWWA recommends that the extraction regulation threshold for large withdrawals be no more than Option B outlined in the discussion paper (250/100m³/day), and that conservative temporary thresholds are required until sufficient data is available for science-informed regulation. BCWWA further recommends that operators of licensed wells be required to measure and report actual water use and groundwater levels.

In priority areas (including known areas as shown in Figure 4F of the technical background report), the criteria for licensing of wells should be informed by a water management plan. In certain areas (e.g. several areas of the Gulf Islands), even individual domestic wells have significant impacts on groundwater quality and quantity due to small aquifer sizes and significant risks of saltwater intrusion due to poor well siting or over-extraction. In such cases, licensing requirements should be considered for all wells, regardless of size and use.

Groundwater reserves are being oversubscribed in some areas of BC (e.g., Hopington Aquifer), and groundwater is being contaminated by point and non-point sources of pollution (e.g.,

Abbotsford Aquifer). BCWWA believes that to conserve and protect groundwater from these impacts, we must first record, monitor, analyze and report their impacts. To that end, BCWWA recommends expanded research that will guide the development of appropriate science-informed plans, policies, programs, projects and partnerships.

BCWWA MEMBERS' VIEWS

Just less than half of survey respondents answered the groundwater questions. Respondents support the following options —

Protect groundwater from contamination	98%
Introduce amendments to prevent adverse impacts on aquifers or groundwater recharge zones	89%
Regulate groundwater extraction and use, at least in priority areas, for all large wells	82%
Require reporting of well levels for regulated groundwater users	77%
Set thresholds for large groundwater withdrawals at 250/100m ³ /day or less	66%

Respondents preferred the following options for determining priority groundwater extraction and use areas —

Areas with known quality concerns (e.g., declining groundwater level, conflicts with other groundwater users, aquifers or water resources impacted by salt water intrusion)	74%
All groundwater users are regulated in priority areas except for small-scale extraction and use for domestic purposes (e.g., 2-3m ³ /day)	73%
Significant population relies on groundwater for drinking	68%



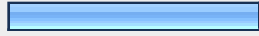


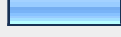
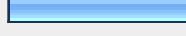


IN CLOSING...

BCWWA supports the province's efforts to modernize BC's *Water Act*, and appreciates the opportunity to contribute to the discussion. Board members and industry experts are keen to continue informing the modernization process. Please contact us to further explain or expand on our comments, and keep us abreast of the process as it unfolds.

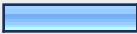
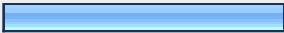


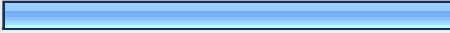
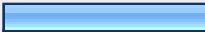

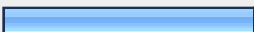

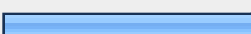
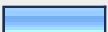

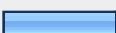
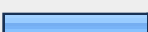


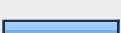
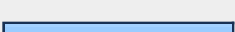
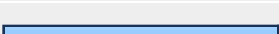
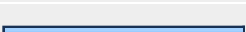
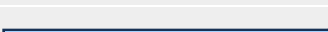
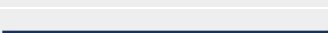
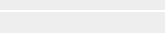
The BCWWA Board of Directors would like to acknowledge the 207 BCWWA members who contributed to the development of this document by responding to the Internet survey. Special thanks also go to the editorial committee that developed this submission on a tight timeline: Steve Brubacher, Crystal Campbell, Len Clarkson, Jennifer Crosby, Don Dobson, Daisy Foster, Bruce Ingimundson, Chris Johnston, Jim Mattison, Ted Molyneux, Julian Noel, Mike Nolan, Denny Ross-Smith, Colwyn Sunderland, and writer Joanne de Vries.


APPENDIX



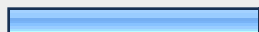


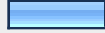







Water Act Modernization



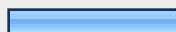

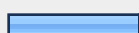






1. Where do you live and work?			
		Response Percent	Response Count
BC Rockies		5.0%	10
Cariboo-Chilcotin-Coast		1.5%	3
Lower Mainland		38.3%	77
Northern BC		4.5%	9
Sunshine Coast		2.5%	5
Thompson-Okanagan		16.9%	34
Vancouver Island		27.4%	55
Yukon		1.0%	2
Other Canada		3.0%	6
USA		0.0%	0
International		0.0%	0
		<i>answered question</i>	201
		<i>skipped question</i>	6

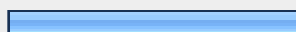
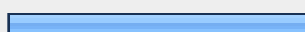


2. What is your field of service or area of interest? (Select all that apply).

		Response Percent	Response Count
Asset Management		20.3%	41
Cross Connection Control / Backflow Prevention		43.1%	87
Decentralized Wastewater		8.9%	18
Desalination		3.5%	7
Drinking Water		68.8%	139
Environmental Protection		31.2%	63
First Nations		10.9%	22
Ground Water		38.6%	78
Hazardous / Toxic Waste		9.4%	19
Infrastructure		38.1%	77
Irrigation		15.3%	31
Laboratory / Analysis		11.4%	23
Legislation / Regulation		16.8%	34
Public Awareness		21.8%	44
Residuals / Biosolids		8.4%	17
Safety		18.3%	37
SCADA & IT		17.3%	35
Small Water Systems		35.1%	71
Wastewater Collection & Treatment		42.1%	85
Water Conservation		36.6%	74
Water Quality		50.0%	101
Water Supply & Treatment		50.0%	101
Watershed Management		24.3%	49

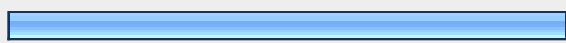


Other (please specify)		7.9%	16
		answered question	202
		skipped question	5

3. Which category / industry sector are you employed in?			
		Response Percent	Response Count
Federal Government		2.0%	4
Provincial Government		4.0%	8
Regional/Local Government / Public Utility		38.6%	78
Private Utility		7.9%	16
Manufacturing / Supply		7.4%	15
Consulting		14.4%	29
Contracting		9.9%	20
Educational Institute		2.0%	4
Industrial		3.0%	6
Research / Laboratory		0.5%	1
Student		3.0%	6
Retired		2.0%	4
Other (please specify)		5.4%	11
		answered question	202
		skipped question	5

4. Which of the following most closely describes your position?			
		Response Percent	Response Count
Senior Government		0.5%	1
Local Government Administration		5.0%	10
Management		25.5%	51
Marketing / Sales		3.5%	7
Engineer / Technologist		20.0%	40
Operator		26.5%	53
Scientist / Academic		2.0%	4
CCC Tester		11.0%	22
Educator		1.5%	3
Student		3.0%	6
Retired		1.5%	3
		answered question	200
		skipped question	7

5. Do you support the strengthening of the objective "Environmental flow needs are considered in all water allocation decisions to protect stream health"?			
		Response Percent	Response Count
Strongly support		44.4%	79
Support		46.1%	82
Neutral		7.3%	13
Disagree		2.2%	4
Strongly disagree		0.0%	0
		answered question	178
		skipped question	29

6. Mitigating the impacts of development on stream health:			
	Yes	No	Response Count
Do you support more emphasis on mitigating the impacts of development (urbanization, agriculture, forestry, etc) to protect and maintain stream health?	96.0% (167)	4.0% (7)	174
This should include requirements for hydrologic maintenance of flows (volume reduction, rate control) to minimize erosion and stream/habitat instability and maintain baseflows and reduce degradation of water quality.	93.4% (156)	6.6% (11)	167
This should also include the requirement for appropriate riparian habitat restoration.	94.6% (159)	5.4% (9)	168
	<i>answered question</i>		174
	<i>skipped question</i>		33

7. Do you support an amendment to the Water Act to support a requirement for the person/people responsible for dumping any substance/material into a stream to restore stream health?			
		Response Percent	Response Count
Yes		86.0%	154
No		2.8%	5
Not Sure		11.2%	20
	<i>answered question</i>		179
	<i>skipped question</i>		28

8. Additional comments on 'GOAL ONE: Protect stream health and aquatic environments':			
			Response Count
			20
<i>answered question</i>			20
<i>skipped question</i>			187

9. Have you encountered any of the following issues with how decisions are made in regards to the management of water?				
	Yes	No	Not Sure	Response Count
a. Lack of adequate acts and regulations to deal with the full scope of water management	51.6% (65)	29.4% (37)	19.0% (24)	126
b. Lack of coordination between different governmental agencies (within the province and between the province and other agencies)	71.7% (91)	16.5% (21)	11.8% (15)	127
c. Some legislation gives trump card to certain agencies	57.5% (73)	14.2% (18)	28.3% (36)	127
d. Lack of transparency in process for making decisions on licenses and plans for water use	52.3% (67)	19.5% (25)	28.1% (36)	128
e. Opportunity to protect water quality for today and future generations (inability to influence land use and water use decisions)	60.5% (75)	21.0% (26)	18.5% (23)	124
f. Inconsistent and overlapping enforcement of regulations	63.0% (80)	18.1% (23)	18.9% (24)	127
g. Inconsistency in continuity of water policy and priorities (ie. Decisions change when the politics change)	59.7% (74)	16.1% (20)	24.2% (30)	124
<i>answered question</i>				129
<i>skipped question</i>				78

10. What do you think is necessary in order to address the issues that you have encountered?				
	Yes	No	Not Sure	Response Count
Better definition of authority, roles and accountability: within the provincial government	77.3% (92)	10.1% (12)	12.6% (15)	119
Better definition of authority, roles and accountability: with other levels of government (First Nations, Federal, local and regional)	77.9% (95)	8.2% (10)	13.9% (17)	122
Better definition of authority, roles and accountability: with other agencies (industry, local communities, and other non-governmental organizations)	75.2% (91)	11.6% (14)	13.2% (16)	121
Increased flexibility to respond to changing needs and values in a timely fashion	74.2% (89)	12.5% (15)	13.3% (16)	120
Improved coordination with neighbouring jurisdictions across all levels of government and those with a major interest in the watershed	86.7% (104)	6.7% (8)	6.7% (8)	120
	<i>answered question</i>			123
	<i>skipped question</i>			84

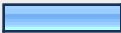
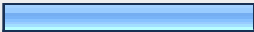
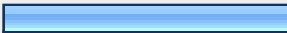
11. Should the provincial government have more or less responsibility for water management at the:					
	More Responsibility	Less Responsibility	Same Amount	Not Sure	Response Count
Provincial Level	54.7% (64)	12.0% (14)	23.9% (28)	9.4% (11)	117
Basin Level (ie. Fraser Basin, Columbia Basin, Okanagan Basin, etc.)	56.1% (64)	6.1% (7)	17.5% (20)	20.2% (23)	114
SubBasin Level (Regional District or WaterAct District)	51.7% (60)	17.2% (20)	16.4% (19)	14.7% (17)	116
Watershed Level (local areas)	47.5% (56)	17.8% (21)	22.0% (26)	12.7% (15)	118
	<i>answered question</i>				119
	<i>skipped question</i>				88

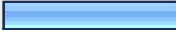


12. What level of involvement / responsibility should the Province have in the following areas:				
	More Provincial responsibility	Delegate responsibility to another agency	Not sure	Response Count
Integration between natural resource agencies and federal government	65.5% (76)	10.3% (12)	24.1% (28)	116
Regional visioning and watershed planning	54.3% (63)	29.3% (34)	16.4% (19)	116
Using Regional Growth Strategies, Official Community Plans or other land use plans to implement water priorities	46.6% (54)	40.5% (47)	12.9% (15)	116
Establish advisory committees for First Nation and stakeholder involvement	47.8% (55)	28.7% (33)	23.5% (27)	115
Formal opportunities to influence resource management and land use planning	54.0% (61)	24.8% (28)	21.2% (24)	113
Water allocation planning and licensing (includes determination of environmental flow needs)	66.4% (77)	19.0% (22)	14.7% (17)	116
Oversight over transfer or extension of water rights	68.4% (78)	17.5% (20)	14.0% (16)	114
Planning and licensing groundwater extraction and use	71.1% (81)	15.8% (18)	13.2% (15)	114
Integrated regulation of connected groundwater and stream water resources	74.1% (86)	13.8% (16)	12.1% (14)	116
Defining 'stream health' and determining environmental flow needs	64.3% (74)	25.2% (29)	10.4% (12)	115
Approving changes in and about streams	54.9% (62)	26.5% (30)	18.6% (21)	113
Compliance and enforcement	76.7% (89)	16.4% (19)	6.9% (8)	116
Drought and flood response (plans and policy)	73.7% (84)	20.2% (23)	6.1% (7)	114

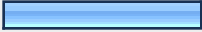
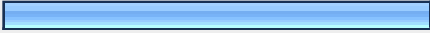


Public education and outreach activities	53.4% (62)	39.7% (46)	6.9% (8)	116
Watershed restoration	55.2% (64)	38.8% (45)	6.0% (7)	116
Reporting on watershed health	55.2% (64)	35.3% (41)	9.5% (11)	116
	answered question			119
	skipped question			88

13. Should the Province take a shared approach (ie. working collaboratively with other governments or watershed management group) in the following areas:				
	Yes	No	Not Sure	Response Count
Regional visioning and watershed planning	88.9% (104)	3.4% (4)	7.7% (9)	117
Formal opportunities to influence resource management and land use planning	81.2% (95)	7.7% (9)	11.1% (13)	117
Water allocation planning and licensing (includes determination of environmental flow needs)	76.1% (89)	15.4% (18)	8.5% (10)	117
Oversight over transfer or extension of water rights	68.7% (79)	19.1% (22)	12.2% (14)	115
Approving changes in and about streams	76.7% (89)	17.2% (20)	6.0% (7)	116
Compliance and enforcement	76.7% (89)	19.0% (22)	4.3% (5)	116
Drought and flood response (plans and policy)	82.8% (96)	12.9% (15)	4.3% (5)	116
Public education and outreach activities	84.6% (99)	9.4% (11)	6.0% (7)	117
Watershed restoration (plans and policy)	85.5% (100)	10.3% (12)	4.3% (5)	117
Reporting on watershed health	80.3% (94)	13.7% (16)	6.0% (7)	117
	answered question			117
	skipped question			90

14. Additional comments on 'GOAL TWO: Improve water governance arrangements':		
		Response Count
		24
	<i>answered question</i>	24
	<i>skipped question</i>	183

15. The current Water Act is based on the principle of first-in-time, first-in-right. Should this principle:			
		Response Percent	Response Count
Be maintained for all licensing		17.7%	17
Be maintained for existing licenses, but not new licenses		38.5%	37
Or be abolished?		43.8%	42
		<i>answered question</i>	96
		<i>skipped question</i>	111

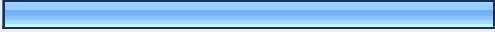
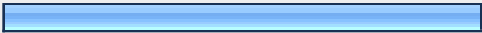
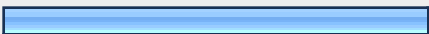
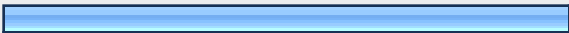
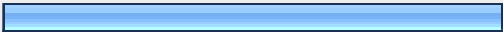
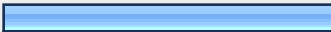
16. In order to encourage water use efficiency, should the Province:			
		Response Percent	Response Count
Determine actual water needs on the basis of efficient practices and works; or		26.5%	27
Establish codes for efficient infrastructure and practices for different sectors in partnership with the sectors, require compliance with the codes, and use incentives and economic instruments to encourage water efficiency; or		52.9%	54
Review the rules for the transfer and apportionment of existing water rights?		20.6%	21
		<i>answered question</i>	102
		<i>skipped question</i>	105


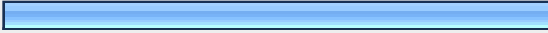
17. In order to encourage administrative efficiency, should the Province:			
		Response Percent	Response Count
Define permitted uses under the Act and regulations that would be applied consistently across the province; or		30.3%	30
Define permitted uses under the Act and regulations, but allow regulations to be applied differently across the province based on risk or through a water use plan; AND		65.7%	65
Allow voluntary self-registration of the permitted use withdrawal; or		6.1%	6
Require self-registration of permitted use withdrawal?		27.3%	27
		<i>answered question</i>	99
		<i>skipped question</i>	108

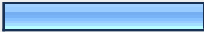
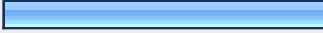
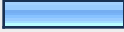

18. In order to provide water users and decision makers with flexibility and to improve efficiency, should the Province provide water licensees and decision-makers with the ability to seek amendments to water licenses' terms and conditions based on:



	Yes	No	Not Sure	Response Count
New information about watershed issues, priorities or changes in supply	92.9% (92)	5.1% (5)	2.0% (2)	99
The ability to use water differently	74.5% (73)	12.2% (12)	13.3% (13)	98
Incentives to consolidate licenses within a community/watershed to inspire collaborative or shared management of the resource	85.6% (83)	9.3% (9)	5.2% (5)	97
Adverse impacts on aquifers or groundwater recharge zones	88.8% (87)	9.2% (9)	2.0% (2)	98
Data showing deterioration of stream health because of lack of water	88.8% (87)	7.1% (7)	4.1% (4)	98
	<i>answered question</i>			99
	<i>skipped question</i>			108

19. To improve decision making times and enforcement, should existing water licensees and applicants be responsible for: (select all that apply)

		Response Percent	Response Count
Providing more detailed information in applications or changes of proposed water use and efficiencies		75.8%	72
Documenting in applications or changes, potential environmental impacts and effects on other users		73.7%	70
Seeking consent from, or consulting with, affected parties when making an application or change		65.3%	62
Measuring and reporting actual water use when demonstrating compliance with water license conditions		87.4%	83
Reporting well levels for regulated groundwater wells		76.8%	73
Self registering wells, especially where groundwater is in direct hydraulic connection with surface water or in areas of known quantity concerns.		50.5%	48
		<i>answered question</i>	95
		<i>skipped question</i>	112



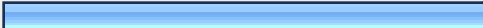

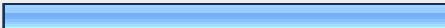
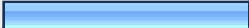

20. In order to integrate ground and surface water allocation, should the Province:			
		Response Percent	Response Count
Allocate new surface water rights and regulate groundwater based on a modified first-in-time, first-in-right concept; or		15.7%	14
Allocate new surface water rights, and regulate groundwater, based on priority of use as determined either in the Water Act, or, with community involvement?		84.3%	75
	<i>answered question</i>		89
	<i>skipped question</i>		118

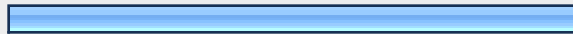



21. Which of the following options do you prefer to address temporary water scarcity?			
		Response Percent	Response Count
Discretionary - Decision maker has discretion to determine approach on a case-by-case basis balancing effects on water users and the environment		30.6%	30
Sharing - All water users reduce use on a proportional basis depending on water supply forecasts. (Reductions could be influenced by water use efficiencies.)		49.0%	48
Hierarchy of use - Water use reductions are guided by a hierarchy of uses, e.g. human, stock watering, etc.		18.4%	18
Date of priority - first-in-time, first-in-right		2.0%	2
		answered question	98
		skipped question	109

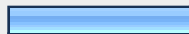
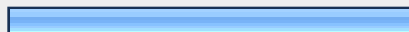

22. Which of the following options do you prefer to address long-term water scarcity?			
		Response Percent	Response Count
Mandatory Water Management Plans (section 4 of Water Act)		29.2%	28
Water licensees and other interested parties develop a plan to address long-term scarcity on a watershed basis and provide recommendations for supply side and demand side changes. Approval process to include community involvement.		70.8%	68
		<i>answered question</i>	96
		<i>skipped question</i>	111

23. Additional comments on 'GOAL THREE: Introduce more flexibility and efficiency in the water allocation system':		
		Response Count
		8
		<i>answered question</i>
		8
		<i>skipped question</i>
		199

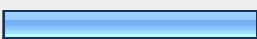
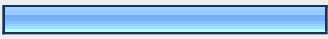



24. The Water Act Modernization discussion document outlines the following options for determining priority areas to regulate groundwater extraction and use. Which of the following do you feel are priorities (select all that apply)?

		Response Percent	Response Count
All groundwater users will be regulated in priority areas except for small scale extraction and use of groundwater for domestic purposes (for example 2-3m3/day).		72.7%	64
Heavy groundwater extraction and use (rely on BC Aquifer Classification System);		59.1%	52
Area of known quantity concern e.g., declining groundwater level, conflicts with other groundwater users, aquifers or water resources impacted by salt water intrusion;		73.9%	65
Groundwater in direct hydraulic connection with surface water in areas of known quantity concern;		52.3%	46
Significant population that is reliant on groundwater for drinking water;		68.2%	60
Trans-boundary aquifers;		37.5%	33
Basins where surface water is at or near the allocation limit.		60.2%	53
		<i>answered question</i>	88
		<i>skipped question</i>	119

25. Do you feel groundwater should be protected from contamination?			
		Response Percent	Response Count
Strongly Agree		87.8%	86
Agree		10.2%	10
Neutral		1.0%	1
Disagree		0.0%	0
Strongly Disagree		1.0%	1
		<i>answered question</i>	98
		<i>skipped question</i>	109

26. Thresholds for large groundwater withdrawals: A. The threshold for large could be: _ 500 m3/day for wells drilled in unconsolidated, sand and gravel aquifers or if otherwise determined to be large by a Water Management Plan. _ 100 m3/day for wells drilled into consolidated bedrock aquifers or if otherwise determined to be large by a Water Management Plan. OR B. The threshold for large could be: _ 250 m3/day for wells drilled in unconsolidated, sand and gravel aquifers or if otherwise determined to be large by a Water Management Plan. _ 100 m3/day for wells drilled into consolidated bedrock aquifers or if otherwise determined by a Water Management Plan. Which thresholds do you prefer?			
		Response Percent	Response Count
A		27.8%	22
B		62.0%	49
C: Other (please elaborate)		10.1%	8
		<i>answered question</i>	79
		<i>skipped question</i>	128

27. The following groundwater-specific objective is proposed for a modernized Water Act: "Groundwater extraction and use is regulated in priority (critical) areas and for all large withdrawals". Please indicate your level of support for the objective proposed.

		Response Percent	Response Count
Strongly Support		38.7%	36
Support		49.5%	46
Neutral		5.4%	5
Disagree		5.4%	5
Strongly Disagree		1.1%	1
		<i>answered question</i>	93
		<i>skipped question</i>	114

28. Additional Comments on 'GOAL FOUR: Regulate groundwater extraction and use':

		Response Count
		13
		<i>answered question</i>
		13
		<i>skipped question</i>
		194

29. Water Act Modernization is an opportunity to ensure the principles underlying the Water Act respond to modern expectations, as well as promote stream health and water security. These principles have underpinned the development of this discussion paper and, once finalized through engagement, will help to guide the policy development process. Your views are welcome on the following proposed principles:

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Response Count
BC's water resources are used within sustainable limits.	62.6% (62)	28.3% (28)	5.1% (5)	3.0% (3)	1.0% (1)	99
First Nations social and cultural practices associated with water are respected and accommodated.	18.0% (18)	32.0% (32)	34.0% (34)	12.0% (12)	4.0% (4)	100
Science informs water resource management and decision making.	38.0% (38)	45.0% (45)	13.0% (13)	3.0% (3)	1.0% (1)	100
Water resource legislation, policy and decision making processes as well as management tools are integrated across all levels of government.	48.0% (48)	33.0% (33)	14.0% (14)	5.0% (5)	0.0% (0)	100
Rules and standards for water management are clearly defined, providing a predictable investment climate across the province.	49.0% (49)	37.0% (37)	10.0% (10)	4.0% (4)	0.0% (0)	100
Flexibility is provided to adapt to extreme conditions or unexpected events on a provincial, regional or issue-specific level.	42.3% (41)	42.3% (41)	6.2% (6)	8.2% (8)	1.0% (1)	97
Incentives are created for water conservation that consider the needs of users and investors.	41.4% (41)	37.4% (37)	13.1% (13)	7.1% (7)	1.0% (1)	99
Rights to use water come with responsibilities to be efficient and help protect stream health.	63.0% (63)	32.0% (32)	5.0% (5)	0.0% (0)	0.0% (0)	100
	<i>answered question</i>					100
	<i>skipped question</i>					107

30. The Water Act Modernization Discussion Paper welcomes additional input on the following topics: - Are there additional opportunities for the modernization of the Water Act to integrate with other federal and provincial legislation? - What are the appropriate criteria for determining at risk or priority watersheds? - How will these proposals specifically affect you or your community? - How can we improve the proposals so your interests are taken into account? - What kinds of collaborative processes would you like to see for future water stewardship? - Will the possible solutions adequately equip future generations to manage water sustainably? - What have we missed? Please feel free to add any comments below, or email wateract@bcwwa.org.

		Response Count
		15
	<i>answered question</i>	15
	<i>skipped question</i>	192

Appendix B

BCWWA Position Statement

Reporting of Water Withdrawals



POSITION STATEMENT

Reporting of Water Withdrawals

**Adopted by BCWWA Board of Directors
June 26, 2012**

BCWWA prepares Position Statements to guide its members and others in the water and waste community in implementing best practices to support the safeguarding of public health and the environment as related to water and waste.

Our protocol for developing position statements begins with a well-researched and balanced analysis of the topic, which is normally drafted with support of one or more BCWWA Technical Committees who are considered to be subject matter experts on the issue. This analysis is then presented to the BCWWA Board of Directors in the form of an Issue Analysis Paper.

The BCWWA Board then prepares a *draft* Position Statement on the topic, for review and input by BCWWA Technical Committees, the BCWWA Leadership Council, the BCWWA membership and in some cases, external stakeholders prior to the final Position Statement being prepared. A special thank you to all those who contributed to the development of this position statement.

POSITION ON REPORTING OF WATER WITHDRAWALS

BC Water & Waste Association advocates implementing a province-wide water reporting system, beginning with large water users and in water scarce areas, to support water planning at all levels, standardize data collection, simplify water use reporting, and make data accessible to improve understanding of water use patterns and conservation efforts over time.

ISSUE ANALYSIS PAPER ON REPORTING OF WATER WITHDRAWALS

SECTION 1: CONTEXT

Emerging understandings of the importance of taking an integrated approach to water resources management and the pressures of climate change and population growth all point to a need for better information to support sustainable water management.

Sustainable water management requires that we conceive, design and operate water systems today so that future generations will have adequate and equitable use of these systems, while at the same time maintaining the ecological integrity of the system. (Vandierendonck & Mitchell 1997)

Balancing social and economic needs for water with environmental needs and managing in a self-sustaining manner all require an understanding of how much water is being used. For this reason “we can’t manage what we don’t measure” is a central theme of the Ministry of Environment’s proposal for the *Water Sustainability Act (WSA)*, which aims to reform water management and ensure BC’s waters are protected for future generations (BCMOE 2011).

Of the roughly 44,000 water licenses in BC, only about 4% are currently reporting usage (BCMOE nda). The vast majority of water licensed in the Province is for non-consumptive uses such as power production. The breakdown of consumptive surface water use based on licensed volumes is:

- Industrial and commercial (36%)
- Waterworks (purveyed systems) (34%) (includes residential, commercial, industrial, institutional, and agricultural uses)
- Agriculture (27%)
- Mining and Petroleum (2%)
- Domestic (1%) (BCMOE 2006)

The above percentages are based on surface water license allocations and are not supported in most cases by consumption data. Actual water use distributions may differ, particularly on a regional basis. For example, in the Okanagan, agricultural irrigation accounts for approximately 55% of water use, and other outdoor uses for approximately 31% (OBWB 2010) of total water extractions. Groundwater is also a significant source for water use; however, since BC is one of the last jurisdictions in North America that does not license, regulate or monitor groundwater extraction, there is little information available on groundwater use (Nowlan 2007). Due to lack of consumption data, the true picture of water use in British Columbia remains largely unknown.

The Province is trying to change this state of uncertainty. If passed, the *Water Sustainability Act* will begin the regulation of groundwater and require more measurement and reporting by license holders, allowing BC to gather the data necessary to “effectively manage water”, “provide a more accurate picture of water availability”, and “measure efficiency of water use over time”(BCMOE 2011).

Increased measurement and reporting of water use can be valuable for planning at all levels; assisting water purveyors to detect and resolve leakage issues, to gauge water consumption across sectors to optimize infrastructure, and to develop and evaluate conservation programs. A web-based reporting system could manage this new data and make it accessible to users.

A pilot reporting system, the BC Water Use Reporting Centre (BC WURC), has been developed in the Okanagan, and is also being used by the Regional District of Nanaimo. The BC WURC was designed to incorporate both (licensed) surface extractions and (currently unreported) groundwater extractions. The system is designed to work anywhere in BC, and was developed through a stakeholder process that included water utilities, provincial ministries, and the Okanagan Basin Water Board.

Groundwater: Relation to public health or protection of the environment

Over-extraction and contamination of groundwater both present threats to human health and ecosystems, in terms of water scarcity and quality. Many of these water-related risks relate to uncertainty about activities in watersheds and the Province's inability to manage groundwater in an integrated way. Because groundwater has been unregulated, relationships between water use and groundwater status are unclear, contributing to conflicts among users, concern about declining water tables and the reduction of stream flow in some areas (BCMOE 2011). Excessive depletion of groundwater can contribute to a number of water scarcity and quality issues: salt water intrusion, drying out of neighboring wells, reduction of baseflows in streams and consequent deterioration in water quality, among others. An estimated one million British Columbians rely on groundwater for drinking (BCMOE ndb). Of the 918 classified aquifers in BC, 34 are deemed "heavily developed with high vulnerability to contamination"; and many of these supply drinking water to municipalities, including Langley, Abbotsford and Prince George (BCMOE ndb).

Increased information on use across surface and groundwater sources would create opportunities for better source water protection and watershed planning, and possibilities for more effective conjunctive use. "Conjunctive use of surface and groundwater consists of harmoniously combining the use of both sources of water in order to minimize the undesirable physical, environmental and economical effects of each solution and to optimize the water demand/supply balance"(FAO 1995).

Relevance to British Columbia

With the proposed *Water Sustainability Act*, British Columbia is aiming "to respond to current and future pressures on water" and to become "a leader in water stewardship" (BCMOE 2010). It elaborates on how the targets set out in the *Living Water Smart* policy will be achieved (2008). Targets such as: obtaining 50% of water for new municipal needs through conservation; improving water efficiency 33% by 2020; watershed management planning for priority areas; and developing new approaches to address climate change adaptation for water resources (ibid).

Currently, one of the biggest obstacles to achieving these targets is lack of data. Watershed planning, for example, requires information on how much water is coming into watersheds and how much is being used. Likewise, conservation efforts are difficult to implement or evaluate given low rates of metering

across the Province. In its 2009 Municipal Water and Wastewater Survey, Environment Canada reported that in BC only 40% of the population had residential meters and 86% of the population had commercial meters (2009). Metering rates mainly reflect water use in purveyed water systems, such as municipalities; however, 66% of all water licenses in BC are for non-purveyed systems, such as farms or industrial operations that draw their own water. Owners of non-purveyed systems lack incentives to meter (see the BCWWA position statement on Water Metering for more information). While metering may not be feasible across all users, some form of measurement and reporting would be beneficial to gain a sense of how much water is being used by large users. At present, combined non-purveyed and groundwater users represent a significant data gap in overall picture of BC's water use.

Good data is essential to watershed and community growth planning, water conservation programming, and achievement of other sustainable water management objectives over the long-term. Recognizing this, the Province has made “measure and report” one of six policy directions guiding the framing of the *Water Sustainability Act* (BCMOE 2010). “Licensed ground and surface water users will be required to report actual water use and in some cases (e.g. in problem areas) stream flow, groundwater levels, well performance, and water quality” (BCMOE 2010). To meet the challenges of managing water across such a large and diverse province, Ministry of Environment has developed “an area-based approach” that determines the level of measurement and reporting required based on local conditions (ibid). This allows the Province to establish baseline reporting requirements across the province, while gathering more specific data to deal with emerging or established water problems.

Purpose and importance of the BCWWA position statement

The purpose of this position statement is to provide policy-makers, water managers and license-holders with information to identify the benefits and challenges associated with increased monitoring and reporting of water withdrawals and to start a dialogue around the design of a Provincial water use reporting system.

SECTION 2: BENEFITS OF REPORTING OF WATER WITHDRWALS

- **Establishes a picture of water use in BC and within local watersheds**

Currently, municipalities and large industrial, commercial, institutional (ICI) and waterworks license-holders report their water use on an annual basis to the Province using handwritten forms. These hands written forms are faxed or mailed into the province where the data is re-entered – this generates a further opportunity for human error in managing this important data. This reporting process can be problematic due to a lack of standardization in measurement and reporting techniques, leading to potential for compromised data quality. Agricultural water license-holders are not typically required to report water usage unless there has been a problem with their water license in the past. Standardizing data collection and reporting across user types and including groundwater and non-purveyed users would allow the development of a comprehensive picture of overall water use in the Province.

- **You can manage what you measure**

Measuring and reporting water usage provides license-holders with a long-term view into their operations, allowing them to better plan for system changes and conservation measures. If license-holders across BC report their water usage to the Province, water allocation authorities can better align water licensing and water use. Knowing where too much or too little water is being used can reveal problem areas, find opportunities for increased efficiency and prioritize water management initiatives. Insights gathered from the analysis of use data across water sources can be used in Integrated Watershed Management Planning to optimize water use while maintaining a balance between human and environmental needs (see the BCWWA position statement on Watershed Management Planning for more information).

- **Provide data to support water management planning and climate change adaptation at multiple levels**

As climate change introduces increasing variability into local hydrological cycles, with shifting average weather conditions and more frequent and extreme climatic events such as floods and droughts (Richardson 2010), data on water use will become more important to water managers at all levels of government. From a provincial standpoint this data can show where there is flexibility for climate change adaptation at the macro-level and contribute to watershed response planning on a regional scale. At the local level, the American Water Works Association (AWWA) recognizes that “water utilities are especially vulnerable to climate induced changes in water quality and quantity” as “they face risks to their water supply and critical infrastructure” and often have “limited climate change data and decision support tools” with which to meet these challenges (AWWA 2010b). In the face of climatic uncertainty, information on the human dimension of the water cycle can be used in efforts to increase conservation, efficiency and resilience within communities.

- **Allows water users to prove efficient beneficial use and protect their water rights**

When initially conceived, the concept of beneficial use in the current *Water Act* was intended to promote economic development in the Province. Now that the focus has shifted from economic to sustainable development, the proposed WSA will add efficiency as a requirement to the beneficial use condition on water licenses (BCMOE 2010). With this change, users will be better able to prove efficient, beneficial use if they have a systematic record of use logged on a Provincial database that shows increased efficiency gains over time.

- **Increases transparency while protecting privacy**

Transparency in water supply reporting is important because it provides tax payers and others with information used in decision making. While it may add complexity to management of the reporting system, this should be considered in the context of benefits such as the supply of water during periods of scarcity, future growth and changing consumer needs. Transparent accounting of water supply ensures decision makers and clients are informed about current and

long-term trends that impact day-to-day management decisions. Currently, little is known about the total picture of water use in BC. Providing aggregated regional data on water use to the public could help to raise awareness about water stewardship in BC and facilitate engagement on water governance issues.

SECTION 3: CHALLENGES OF REPORTING OF WATER WITHDRAWALS

- **Investment is required for data acquisition and a Provincial reporting system**
Overhauling water governance in BC is a long-term project, one that requires significant financial and human resources be invested to gather appropriate data to gain a more accurate picture of water use. A Provincial reporting system is the most efficient way to manage and utilize this data, but will require a certain level of resources to maintain, even after it is built.
- **Use it or lose it**
Licensing and use are not aligned in the Province, which creates potential for public resistance and conflict over water rights when measurement and reporting requirements are brought in. This is particularly challenging given the uncertainties surrounding First Nations water rights and heretofore unregulated groundwater users.
- **Myth of abundance: Lack of perceived need**
The perception of water abundance and apathy towards water use issues may hinder the Province's ability to garner the political support and funding necessary to implement a Provincial reporting system. Making an effective case for provincial reporting will require an engagement process and clear communication about how data is gathered and how it can be used to serve the public good.
- **Need incentives to get people to gather and input data**
Individuals responsible for managing water understand the value in good data management. Gathering and reporting data involves work for individual water license-holders. Getting them to participate in measurement and reporting initiatives - especially if the time scale is more frequent than once per year - may take statutory incentives, such as building requirements into water license conditions. License-holders may also respond to other incentives, such as having easy and powerful tools to better analyze and understand their own water use.
- **Accuracy of data**
There is always the danger that data will be collected that is not accurate enough to meet management objectives. Care needs to be taken to define reasonable thresholds for data quality and best practice guidelines for measurement and reporting - it may also be valuable to establish a process for reviewing the data for basic quality assurance and quality control (QA/QC).

- **Privacy of data**

Water, surface and groundwater, is a resource that belongs to the Province and is a public good. Personal water use data may be misused and where collected should be aggregated to protect individuals' privacy.

SECTION 4: BACKGROUND

Creation of a provincial water reporting system

One of the most efficient possible solutions for managing water use data would be to develop a Provincial reporting system. The system should be web-based and provide users with support tools suited to their license type and measurement method. Metering is the preferred method for water use measurement, especially for purveyed water systems (see BCWWA position statement on Water Metering); however, there are circumstances in which metering is less viable or problematic. For example, in smaller communities that currently lack the resources to support a water metering program, or in irrigated agriculture where there can be a fairly high rate of meter failure due to vibration on pumping systems or by meters becoming clogged by lower quality water. To simplify non-metered data gathering, water use calculators could be developed and integrated into the system, particularly for industries such as agriculture, with standardized protocols for determining water use based on irrigation system specifications and operating information.

If the Water Sustainability Act lays the foundation for collecting high quality data to meet well defined management objectives, then the Province will be able to maintain a reporting system to gather the data it needs to manage effectively and which provides license-holders with an easy way to report and track monthly usage (or even more frequent time-steps).

Having a centralized reporting system offers a wide range of benefits, such as providing decision-makers with data for water system planning. Water license-holders could easily monitor the impacts of water conservation efforts or system changes on water usage over time. Government transparency and water awareness could be increased if the system was designed to provide aggregated data to the public. The Province could use the system for water license evaluation and enforcement, development of climate change adaptation strategies and watershed planning – making sure that the most efficient beneficial use is being made of BC's waters. The BC WURC is a good example of such a functional, centralized reporting system that has Provincial application. See www.bcwaterusereporting.ca for more information.

Examples from other jurisdictions

There are a number of online water use reporting systems operating in Canada and the United States. In Canada, Alberta's Water Use Reporting System (WURS) was established to support their Water for Life policy; it allows licensees to report their diversions online on a daily, monthly or annual basis depending

on the conditions of their license (Alberta Environment 2009, 2012). Ontario also has an online Water Taking Reporting System (WTRS) and requires all permit holders (anyone taking more than 50,000 litres a day) “to collect, record and report data on the volume of water taken daily” on an annual basis to the Ministry of Environment (OMOE 2010).

In the United States, the state of Washington’s Department of Ecology has an Online Reporting System, to which water rights holders with “surface water diversions greater than one cubic foot of water per second, or diversions and withdrawals from surface and groundwater sources that support fish stocks classified as critical or depressing” must report daily meter readings for each year (WDE nd). Oregon’s Water Resources Department has an online reporting system and requires annual reporting from any permits holders with metering and reporting requirements on their water license (OWRD 2011). In Wisconsin the Department of Natural Resources requires registered withdrawers (those with systems able to withdraw 100,000 gallons per day or more) to “measure or estimate the volume of water they withdraw every month” and report that data annually to their Online Reporting System (WDNR 2012). Most of these examples focus on gathering data from large water users, though their definitions and reporting requirements in terms of measurement and frequency vary.

For BC, the Okanagan Basin Water Board, working with partners at the Ministry of Environment and Ministry of Community, Sport and Cultural Development, created the BC Water Use Reporting Centre (formerly the *Streamlined Water Use Reporting Tool*) targeted at large-volume water users and water utilities in particular “to improve efficiency for both the water user and government agencies by standardizing data collection, organizing the information, and providing it back in useable form” (OBWB 2012). As part of the development phase of this pilot initiative (2009-10), an extensive evaluation of reporting systems from around the world was completed – incorporating best practices and standard reporting systems. The operational BC WURC (www.bcwaterusereporting.ca) is easy to use and has been successfully implemented. The reporting tool piloted in the Okanagan and in Nanaimo is designed to be fully scalable for a range of water users in different areas of BC.

Starting a dialogue

Fully-implementing a large information system involves considerable time, thought and resources – and extensive dialog. It is important to be very transparent about the goals and objectives of a large data initiative early on, and to gain support of the primary water users who will be contributing data to the system. The system must meet the needs of the users as much as the needs of the province and regional water managers.

To get a dialogue started around this issue, provincial policy-makers, water managers and water license-holders need to think about:

- What are the goals of a Provincial water reporting system? If you had the perfect solution what would you be able to do?
- What data is available to support these goals? How accurate does the data need to be? Is it economically feasible to get the data needed to meet your goals?
- How can data be provided with the least amount of effort?

- How can water use data collected in one database be used/accessed for a variety of information needs? (i.e. billing and accounting, reservoir safety, drought management, etc.)

The proposed area-based planning framework for the Water Sustainability Act indicates a need for data at different levels (i.e. standardized high level data across the Province and more precise data gathered from users in chronic problem areas), so consideration should be given to customizing the system to meet goals at both planning levels.

SECTION 5: OPTIONS AND IMPLICATIONS

- **Monitoring and reporting by large water license holders and those in problem areas to a Provincial database**

This option would involve water measurement and reporting by water users over a provincially defined threshold for large users, for example, 250 cubic meters a day for surface water or 11 cubic meters a day for groundwater based on license volume. To address local water issues an area-based planning approach can be used, which may also require smaller users to report water usage in problem areas. This option is consistent with the proposal for BC's *Water Sustainability Act*.

In line with examples from other jurisdictions, this option would target the highest water users while limiting the overall amount of data that needs to be gathered and managed. This option for reporting offers the 'biggest bang for buck' by tracking the largest water users while also allowing for tracking of smaller users that may have important cumulative impacts in areas of concern. There is a fairness issue with this option as it does not treat all water license-holders equally.

Expanding the BC WURC pilot may be considered to determine its efficiency as a data collection platform to support the collection of surface and groundwater use and provides water managers with timely data to support integrated watershed management.

- **Monitoring and reporting by all water license-holders to a Provincial database**

This option treats all license holders equally and gains a more comprehensive picture of water use in the Province that supports integrated water use management. This option may also involve extensive training, a high level of maintenance and collection of more data than is necessary.

The rewards of a well-designed system can be great, in this case enabling the Province to improve efficiency of staff and manage water resources in a comprehensive and sustainable way; however, the initial planning phase is critical to avoiding the trap of expending large amounts of resources to collect the wrong data. A well-designed system will be scalable, permitting the system to grow in complexity as needs arise.

One important consideration is the frequency of water use data. It is recommended that water use be reported at least monthly. Annual water use reporting does not support effective integrated water use management practices – because of seasonal variation in water use throughout the year.

- **Monitoring and reporting by all water uses to a Provincial database (universal reporting)**
There could be a requirement that anyone who is using water should be required to report that use regardless of size, location and type of use. This option is not recommended as it is not linked to the existing water license system and would therefore make water user identification and tracking extremely difficult. Data quality assurance would also be problematic across all users. The sheer volume of data that, in most cases, would not be useful, speaks against this option as data should be appropriate to management objectives.

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Appendix C

BCWWA Position Statement

Watershed Management Planning



POSITION STATEMENT

Watershed Management Planning

Adopted by the BCWWA Board of Directors
September 19, 2011

BCWWA prepares Position Statements to guide its members and others in the water and waste community in implementing best practices to support the safeguarding of public health and the environment as related to water and waste.

Our protocol for developing position statements begins with a well-researched and balanced analysis of the topic, which is normally drafted with support of one or more BCWWA Technical Committees who are considered to be subject matter experts on the issue. This analysis is then presented to the BCWWA Board of Directors in the form of an Issue Analysis Paper.

The BCWWA Board then prepares a *draft* Position Statement on the topic, for review and input by BCWWA Technical Committees, the BCWWA Leadership Council, the BCWWA membership and in some cases, external stakeholders prior to the final Position Statement being prepared. A special thank you to all those who contributed to the development of this position statement.

POSITION ON WATERSHED MANAGEMENT PLANNING

BC Water & Waste Association advocates implementing integrated watershed management plans for all watersheds where water is taken for human consumption or planned for future human consumption and with urgency given where conflicting priorities exist. The plans should be flexible, principle driven and risk based and the process should engage all stakeholders who share the watershed.

ISSUE ANALYSIS PAPER ON WATERSHED MANAGEMENT PLANNING

SECTION 1: CONTEXT

Relation to public health or protection of the environment

Water is a resource that affects all aspects of life. As such, how we manage our use of this precious resource must ensure we have access to the benefits of functioning hydrological processes, such as water supply and waste assimilation, now and in the future. This goal of sustainable use requires a shift in management paradigm. Many management concepts have been developed to address various negative impacts of human activity on water and the ecosystems affected by water flows: Ecosystem-based management, Integrated Watershed Management Planning (IWMP), Liquid Waste Management Plans (LWMP), Integrated Stormwater Management Planning (ISMP), Source Protection Planning (SPP), Water Management Plans (WMP), water-centric planning, and others. The overall essence of these planning tools is a requirement to look at the system and think comprehensively, beyond water reservoirs and pipes to an understanding of how an ecosystem provides water-related services and how all human activities from forestry to flushing toilets affect the hydrological cycle (Miles 2009).

Unless otherwise stated, this document will use the term Integrated Watershed Management Planning (IWMP) in reference to comprehensive water management planning processes. IWMP is defined as a process to manage human activities, within an area defined by watershed boundaries, for the protection of terrestrial and aquatic resources by considering the local environmental, social, and economic context in decision-making (Infrastructure Canada 2007, Manitoba Water Stewardship 2011). IWMP is a widely accepted term for a comprehensive planning process that encompass other more specific plans such as ISMP or SPP that focus on one aspect of the watershed: wastewater outputs and drinking water supplies in these cases. The Province of B.C. is in the process of updating the Water Act, with the potential to encourage more integrative management planning through Watershed Sustainability Plans, making an issue analysis paper focusing on IWMP particularly timely. According to Infrastructure Canada, IWMP allows “stakeholders and resource management organizations...to cooperatively prioritize human and financial resources to address safe and sustainable drinking water supplies, maintain healthy aquatic ecosystems, and other issues as identified through planning process to best fit (the) watershed” (Infrastructure Canada 2007).

The guiding principles of IWMP include:

- Ecosystem-based approach to better understand the value of water-related ecosystem goods and services;
- Multi-stakeholder participation to build support;
- Goal-oriented (focused on specific, measurable variables for implementation);
- Dynamic and iterative (monitor and revise plans to better meet sustainability goals in a constantly changing world) and;
- Recognition of limits to water supplies and uncertainty in accessing water resources (must be efficient users to avoid scarcity due to climactic shifts, population growth, infrastructure failure)

Implementation of IWMP ultimately requires the integration of missions, mandates and accountabilities of participating stakeholders to put water sustainability front and centre on the agenda of land use or resource planning initiatives. As it is a complex process, questions arise as to the scale of decision-

making, who has implementation authority and responsibility to see goals are met, and who needs to participate.

Relevance to British Columbia

In British Columbia, the ecological diversity and multi-jurisdictional nature of watersheds pose management challenges that vary from watershed to watershed. For example, a seasonal abundance of precipitation on the coast is matched by equally significant drought conditions in the interior of the province. While we are all faced with the realities of climate change and the impacts of disease on our forests, ecosystem-wide variables largely beyond our control, how those variables affect a particular watershed will depend on the local ecological context. Climate change may bring greater risk of flooding to one region and drought to another, requiring planning to help communities adapt to the specific challenges affecting their watershed. Communities across the province must also live with the impacts of varying degrees of urban and industrial development on the watersheds providing critical ecological services such as clean drinking water and irrigation supplies supporting our food security. The challenge is how we can address these issues in a way that is fiscally responsible while adapting to the changing environment in which we live. The scope of issues linked to water necessitates management be comprehensive, but where do we draw the boundaries around planning processes in light of the variation in issues across the province?

The provincial government has offered a tool that could support IWMP - Water Management Plans (WMP) - as part of the *Water Act*. WMPs are intended to be a basis for provincial regulation on surface and groundwater quality, instream flow requirements, and water supply, among other issues (Fraser Basin Council 2011). However, these plans are limited in scope by provisions such as section 65(2) that restrict the ability of a WMP to address the impacts of forestry activities (other issues in relation to the development of WMPs are discussed in Section 3). Current efforts by the province to modernize the *Water Act* have included a policy direction to develop Watershed Sustainability Plans, which may be a more comprehensive planning tool than WMPs. A position on this topic by BCWWA may be helpful to the Province.

Purpose and importance of BCWWA position statement

This Issue Analysis Paper discusses whether comprehensive planning processes are necessary for addressing water sustainability issues in all watersheds in the province. Or, based on the cost and effort to engage in a planning process, is there an alternative to a comprehensive watershed plan? Should priority watersheds be selected for planning activities in order to best use limited resources? Should priority issues be identified in all watersheds across B.C. to focus planning on addressing those particular concerns? How should each level of government support planning efforts? A position statement on this topic prepared by the BCWWA will assist local governments and other stakeholders addressing watershed-related issues in making informed decisions on their approach to long term sustainable management of water resources.

SECTION 2: BENEFITS OF WATERSHED MANAGEMENT PLANNING

- **Improve understanding of water-related ecological goods and services**

IWMP requires resource users to build an understanding of the resource at the ecological unit needed to provide desired ecological goods and services: the watershed (Global Water Partnership 2000). This requirement is based on the ability of water to connect multiple users via the flows of water through the landscape. Sustainable management of water resources dictates that human activity should not limit the ability of a watershed to provide those ecological goods and services - drinking water supply, waste assimilation, agricultural irrigation, climate moderation, and wildlife habitat among others, that we are dependent upon now or in the future (Holling 2001, Miles 2009). In particular, organizations such as the Fraser Basin Council (2011) have highlighted the importance of integrated planning efforts in light of the significant cross-jurisdictional effects climate change is predicted to have upon our communities, impacting all aspects of day-to-day life.

- **Bring together multiple stakeholders for improved decision-making**

Another concern relating to present efforts to manage water resources is the lack of multi-stakeholder planning. Even with some utilities attempting more comprehensive planning processes, they are often limited in their scope due to the limits of their authority - Liquid Waste Management Plans are focused on waste outputs, SPP on the opposite end of the watershed. Under the current *Water Act*, Water Management Plans cannot be used to affect forestry activities. As just one example of human impacts on watershed functions, logging can affect a watershed's ability to store water, thereby affecting the amount of water available for drinking water users, agricultural irrigation, and wildlife habitat among other impacts such as erosion and habitat loss.

Plans involving a wide stakeholder base are more likely to be successful in building public trust and buy-in (EPA 2011). Watersheds rarely conform to political boundaries, so multi-stakeholder partnerships are required to allow planning recommendations to be implemented effectively and equitably - leaving one jurisdiction to shoulder the burden is unfair and unlikely to be successful. IWMP encourages stakeholders to share responsibilities and pool resources from the start of the planning process through to implementation (Miles 2009, EPA 2011). Successful implementation is also dependant on good information, which is best provided by stakeholders who can offer a clearer picture of their particular water resource needs. When tough decisions must be made on who can access supplies during a drought, a multi-stakeholder planning committee will be in a better position to create support for access priorities and clarify how much water they could live without in a worst case scenario (EPA 2011).

- **Adaptable and responsive management**

Watershed-based management tools such as IWMP aid in ensuring that the scale of resource management decisions, and the information on which they are based, remain congruent to the scale of ecological activities affected by those decisions (Miles 2009). Policies set at the provincial or federal level may overlook locally important information, while focusing on a smaller area may exclude important impacts (POLIS 2005). A key issue in water management is the concentration of downstream impacts from multiple wastewater outfalls, which is a result of wastewater managers only needing to address pollutant concentrations in the immediate area of their outfall. While downstream users may raise concerns that they are getting higher concentrations due to multiple outputs, they have no forum to address them in absence of a planning process encompassing the whole watershed (Dahlenburg 2005). An IWMP process could allow for environmental monitoring to show the collective impacts of pollutants over time in addition to ecological variability, such as climactic cycles, that may exacerbate pollution concerns. Such a broad monitoring program would

not likely exist at the local government level as the fiscal resources are not usually available. IWMP would be a useful tool to direct resources from multiple agencies to the long term multi-jurisdictional ecological monitoring needed to better understand water flows and impacts to water-related ecological functions as a result of variables such as climate change (POLIS 2005).

Managing risk is a key function of government. IWMP allows for a better understanding of the risks to water-related ecosystem goods and services through the necessity of integrating information from a variety of sources and building a better understanding of the connections between activities occurring within a watershed (EPA 2011). Better information leads to better decisions, improving the ability of governments to adapt to changing conditions and reduce the risk of infrastructure failure. A lack of knowledge is considered a key issue in source water protection, as is evident in the resources spent on educational signage and building partnerships with recreational stakeholders to discourage damage to reservoirs. Knowledge can also help avoid conflicts by revealing shared values for ecosystem goods and services (Nelson, Adger, and Brown 2007). Maintaining watershed functions to support water supply meets the need for drinking water but also supports food security in agricultural regions dependant on irrigation supplies. While these user groups may have concerns over how that water supply is allocated, they both recognize the importance of a functioning watershed to ensure a sustainable supply. Recognizing these shared values can aid in problem-solving by encouraging stakeholders to move away from entrenched positions and seek solutions based on consensus (Lebel et al. 2006). The ability to adapt through partnerships and knowledge-sharing will be increasingly important as climate change impacts affect access to water-related ecosystem goods and services (Cohen et al. 2006).

SECTION 3: CHALLENGES OF WATERSHED MANAGEMENT PLANNING

- **Local government lacks resources for watershed-based process**

IWMP requires the dedication of time and money to support data collection, consultation with diverse stakeholders, education of resource users to improve their operational practices, and management of cross-jurisdictional activities. These resources are often not available at the local government level, as a result of limits to their taxation base (Mirza 2007). Organizations such as the Federation of Canadian Municipalities have called on senior governments to offer local governments a more equitable share of tax revenues, to match the downloading of responsibilities for ecosystem management, but others feel that environmentally-related planning should be managed by the province as the primary level of government responsible for natural resource management. If comprehensive planning were to cover every watershed in British Columbia, the management process would need to be legislated by the province as local governments lack the authority to do so. Based on existing legislation, the provision for Water Management Plans in the *Water Act* is little incentive for local governments to pursue comprehensive planning due to the major investment of resources needed.

The case has also been made that the province is the level of government needed to pursue IWMP as it is the only jurisdiction covering the entire area of any particular watershed. While regional districts may have boundaries similar to the watersheds providing water supplies or assimilating treated effluent, most aren't a perfect fit. A prime example is the Regional District of North Okanagan (RDNO), which covers lands in both the Shuswap and Okanagan Basins, drawing water supplies from one basin while emitting effluent into the other. If a watershed-based plan was

required for each basin, the RDNO would need to take part in separate planning exercises for both basins. This also raises the question of who would be the lead agency for a shared watershed, in the event that the province made IWMP a requirement for all watersheds.

Current legislation allows for Water Management Plans, which could be considered support for implementing IWMP province-wide, yet only one WMP (for the Township of Langley) has been attempted. Understanding some of the issues that arose during the development of the Township's WMP, along with other experiences, reasons for the lack of WMPs may include:

- no local organization dedicated to process - responsibility for water management seen as being beyond their jurisdiction;
- need a champion willing to take on process since no one organization is responsible - without a leader, participants can shirk responsibility;
- resources not available to most local governments for data collection, which is a prerequisite for effective planning;
- major effort needed to engage other stakeholders, develop new cooperation agreements, and secure financial support;
- difficult to maintain momentum for multi-year process without dedicated staff to see it through - if left to just one or two people process will lose steam if they change jobs or retire and most local governments don't have dedicated environmental staff able to focus on a major planning initiative;
- no funding offered by province to support WMP activities at local level; and,
- WMP not linked to regulatory activities of local governments – follow through is not likely if plans are not relevant to municipal government activities/bylaws.

While the current WMP legislation is seen as too open ended and lacking clear direction, a more prescriptive WMP process could also cause problems. If elements of the process are seen as being too onerous or irrelevant to the needs of local stakeholders, such as a detailed urban development assessment for a rural region, this too may discourage participation. If managed provincially with a one-size-fits-all approach, the vision and needs of those directly affected by activities in a specific watershed may be lost. And without fiscal support it is unlikely a local government could meet more stringent planning requirements.

- **Water often seen as a low priority**

The myth of abundance continues to colour public perceptions about water. Calls to build new dams and spend large sums on major capital infrastructure tend to disappear when drought conditions end. Parking and potholes often dominate local government agendas over natural resource planning. However, public interest in environmental planning varies greatly across B.C., resulting in a great variation in political will to embark on watershed-based planning. Some communities may see watershed-based planning processes as barriers to economic development, impeding growth and costing jobs. Others view watershed-based planning as an opportunity to develop value-added industries, such as tourism or non-timber forest products, as a result of planning to support the watershed's ability to provide ecological goods and services. In terms of understanding the economic value of watershed functions, it is important to note that many functions such as waste assimilation go unaccounted for. The cost of land development currently does not include most of the ecological externalities caused by the increased impervious surfaces it creates, resulting in stormwater pollution and the loss of hydrological connectivity (Curran et al. 2007). By avoiding more

comprehensive planning, decision-makers can continue to place the burden for paying for those externalities on the taxpayer, through the costs to maintain and upgrade stormwater infrastructure in this case.

As watersheds have been generally able to function under the pressures of urban development in B.C., or rebound quickly, there is a lack of public awareness of what consequences could befall a community if a watershed could no longer function to provide necessary services. While most people remember the forest fires of 2003, few will recall the drought conditions that severely impacted many water suppliers that same year as there is no visible scar on the landscape. High population mobility exacerbates this lack of collective history, as B.C.'s population growth has been fuelled more by immigration than a high birth rate (BC Stats 2010). Immigrants are not aware of the lost natural amenities in their communities as they weren't there to see the past state of the ecosystem. If the community does not realize that a creek used to run through their neighbourhood, they will not see a need to restore it.

- **Lack of integration with other management activities**

IWMP requires that all relevant stakeholders be included and that those stakeholders contribute to implementing the outcomes of the process. In addition to various local governments, First Nations groups, large private landowners, recreational interests, business interests, and resource industries would all need to participate. There have been many examples in B.C. of particular stakeholders opting out of regional governance partnerships or ignoring the recommendations of those bodies often as a result of the process being considered irrelevant or too weak to result in change. On the other hand, having to force groups to work together on provincially mandated watershed plans not integrated with other regulations may not inspire the trust needed to support successful implementation (Lebel et al. 2006, EPA 2011). In either case, a lack of consensus at the planning table can lead to delays and impede economic growth if a watershed plan is required in advance of land use decisions.

SECTION 4: BACKGROUND

The BCWWA Water Sustainability Committee developed the Water Sustainability Action Plan (WSAP) in 2004. The Action Plan recognizes the benefits of an ecosystem-based approach to land use planning and resource management, as well as the need to assess cumulative impacts for the benefit of communities now and in the future (BCWWA 2004). The plan advocates for water-centric planning in all levels of decision-making, encouraging the integration of water management into existing planning frameworks such as Regional Growth Strategies (RGS) and Official Community Plans (OCP) (BCWWA 2004). A 10-step methodology was developed to facilitate “planning with reference to watershed-based features so that resource, land use and community design decisions are made with an eye towards their potential impact on the watershed” (BCWWA 2004). The Plan’s Vision Statement incorporates elements of stewardship and social responsibility for water resources and establishes principles that, “promote a watershed-based approach that manages the natural environment and the built environment as integrated components of the same watershed”. The South Okanagan Regional Growth Strategy is held as an example of being one of the first “water-centric” plans.

Other professional association positions

The Canadian Water and Wastewater Association supports the concept and principles of environmental sustainability, and in particular watershed and water recharge area management (CWWA 2011). Water and wastewater services are encouraged to manage water quality and protect the environment on a watershed or water recharge area basis; and when the area is not entirely within their jurisdiction, to collaborate with relevant authorities to do so.

The American Water Works Association (AWWA) supports and promotes sound, sustainable water resources planning and management that provides for an adequate supply of appropriate quality water for people (AWWA 1975a). The AWWA also strongly supports securing drinking water from the highest quality sources available and protecting those sources to the maximum degree possible (AWWA 1975b). AWWA policy states that the quality of existing and all potential sources of drinking water supply shall be actively and aggressively protected, enhanced and maintained.

Status of other provinces

Several provinces have initiated comprehensive watershed planning processes. Manitoba lists 22 watersheds as having established IWMPs. Alberta has embarked through legislation on a process to create comprehensive land use plans for its defined 7 watershed regions that cover the entire province. Quebec also initiated the creation of 33 watershed-based agencies as part of the 2002 Quebec Water Policy.

Ontario has focused on developing plans in conjunction with their Conservation Authorities, resulting in 129 watershed or sub-watershed focused management plans. A 2002 study of conservation authority efforts in source water protection found that no single formula existed for creating successful multi-stakeholder partnerships and that it was often helpful for smaller sub-watershed groups to be established, as a particular conservation authority may cover a geographic area much larger than necessary to address a particular issue (Guelph 2005).

B.C. watershed-based planning case studies

The Cowichan Basin on Vancouver Island offers an example of how watershed-based planning has occurred on the ground. The Basin is composed of several watersheds and this scale of planning was chosen based on the connections of those watersheds to Cowichan Lake and the Strait of Georgia, communities within the Regional District, and nearby First Nations Communities. The plan developed for this basin focused on water quantity and demand issues, as summer and fall water demand often exceeded supply, while other water management issues like water quality were not seen as a pressing concern (Westland 2007). Previous efforts to address water demand concerns in the Cowichan Basin involved an ad hoc committee whose focus was crisis decision-making during drought periods. The stakeholders involved decided that this mode of governance was inadequate to deal with the long-term and complex issues facing the Basin and chose to work proactively to establish the Cowichan Basin Water Advisory Council (Westland 2007). This Council's purpose is to coordinate the stakeholders involved in water-related activities in the Basin and assist them in implementing the management plan. The CBWAC is set up to be an advisory committee to the Regional District Board with representation from elected local government officials, major industrial water users (mills, agricultural operations), First Nations, provincial and federal environment and fisheries ministries, the school district, recreational groups, and waterfront land owners. Key elements of the Council's mandate include:

- being an advocate for water management and full implementation of the plan;
- advising regulators on water licenses, weir operations;
- advising municipalities and the CVRD on water-related implications of land use decisions and planning policies;
- advising provincial resource agencies on forestry, agriculture, mining, highways, and other developments that have the potential to affect water;
- designing and, in some cases, implementing water conservation projects;
- leading efforts to increase public awareness of water issues;
- setting priorities for Plan actions and monitoring the achievement of Plan goals and objectives; and
- promoting partnerships to help achieve Plan goals (Westland 2007).

By limiting its scope the CBWAC plan cannot be considered a true IWMP, but it does generally meet other defining criteria of being ecosystem focused, collaborative, and dynamic. The CBWAC experience is similar to many others across the province. Another tool used in B.C. for multi-stakeholder planning at a watershed scale is the Water Use Plan (WUP) process. The District of Summerland has pursued this option to address water allocation concerns under low water flow conditions. The WUP process is perceived as a useful process for tackling water use issues and getting stakeholders started on working together, but not comprehensive watershed management due to its limited focus on allocating water use in times of drought. This is another example of a planning process focused on a particular issue at the watershed scale to encourage stakeholder participation and limit the scope of the process in order to simplify the overwhelming complexity of tackling every human-watershed interaction.

It appears that most watershed management activities in B.C. tend to focus on specific issues that were the spark that ignited the management planning processes (Fraser Basin Council 2011). However, the Okanagan Basin Water Board (OBWB) provides an example of an institutional framework that is close to true IWMP. This organization supports source protection, drought management, pollution and invasive plant control, as well as wastewater management initiatives - key basin-wide water management issues. While many of its projects are issue driven, the OBWB is developing a data collection that spans all aspects of water use in the basin, helpful in better understanding the overall basin hydrology and linking human impacts across local governments and sub-basin watersheds. The OBWB offers scientific support to its member municipalities, as well as funding opportunities to support water management activities, which allows local governments to develop policies and programs best suited to their needs with the technical guidance needed to avoid re-inventing the wheel. As a part of the regional district framework but also incorporating water industry associations and First Nations representatives, this organization operates as a tool for governance without creating another level of political authority to ensure water management issues remain linked to local government activities. The Okanagan Sustainable Water Strategy showcases effective multi-stakeholder participation, providing a guide to prioritizing water issues across the Okanagan Basin while highlighting the actions each member of the group has committed to implementing. The Fraser Basin Council is an organization that also offers an instructive model for developing the technical support needed for effective decision-making. The FBC Water and Watershed Planning for Communities guide is a comprehensive manual for local governments seeking to take a watershed-based approach to water management.

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