POLIS Project
on
Ecological Governance
University of Victoria

Awash with Opportunity

Ensuring the sustainability of British Columbia's new water law

Oliver M. Brandes, Savannah Carr-Wilson, Deborah Curran, and Rosie Simms





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CONTENTS

Acknowledgements iv
Authors vi
Executive Summary vii

1. INTRODUCTION: GETTING BRITISH COLUMBIA'S NEW WATER LAW RIGHT 1
1.1 Report Purpose and Overview 1
1.2 British Columbia's New Water Law: An Overview 2
1.3 The Changing Waterscape and British Columbia's Water Regulations 4
1.4 The Future of British Columbia's Fresh Water: The Need for New Partnerships for Management and Governance 5

2. KEYS TO SUCCESS: ENSURING ROBUST AND EFFECTIVE REGULATIONS 12
2.1 Groundwater: Protecting British Columbia's Buried Treasure 12
2.2 Environmental Flows: Ensuring Aquatic Ecosystems Survive and Thrive 17
2.3 Monitoring and Reporting: Building a Foundation for Better Decision-Making 24
2.4 Water Objectives: Integrating Water Issues into Decisions on Land and Resource Use 28
2.5 Planning and Governance: Preparing British Columbia for a Sustainable Future 35

3. NEXT STEPS: WATER LAW REFORM AS PART OF A BIGGER PICTURE 43
3.1 Tributaries Flowing into a Much Larger River 43
3.2 In Summary: From Lessons to Action in British Columbia 44

Appendix A: The *Water Sustainability Act* in a Nutshell 46
Appendix B: British Columbia's Emerging Water Issues 48
Appendix C: Water Sustainability Planning Flowchart 53
References 54

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Executive Summary

British Columbia has a once-in-a-lifetime opportunity to significantly improve its water law regime. In May 2014, the Province enacted the *Water Sustainability Act*, which replaced the 106-year-old Water Act. This new Act provides an unprecedented opportunity to fully modernize British Columbia's water laws. While the *Water Sustainability Act* has several promising features, many of the critical details of the legislation have yet to be developed. Effective supporting regulations and sufficient resources are essential for the Act to reach its full potential as a comprehensive and modern law.

The right regulations and following through with implementation are what is needed to put the "sustainable" in the *Water Sustainability Act*. Escalating water-related concerns in the province, such as droughts, floods, and river, stream, and aquifer degradation as well as conflicts over water use, underscore the urgent need for a comprehensive change to water management and the supporting legal structure.

Overview

This report provides an analysis of the *Water Sustainability Act* and the core regulations required to bring its sustainable aspects into full effect. It outlines leading best practices from around the globe and offers clear recommendations for *WSA* regulation development in five key areas:

1) Groundwater licensing;
2) Environmental flows;
3) Monitoring and reporting;
4) Water objectives; and
5) Planning and governance.

Prerequisites to Successful *Water Sustainability Act* Implementation

Full implementation of the *Water Sustainability Act* certainly depends on developing the core regulations – but also requires shifting towards new partnerships for water management and governance and committing sustainable resourcing as two necessary prerequisites to ultimate success.

A New Partnership for Management and Governance

British Columbia's existing water governance regime does not align with the complexity of today's water issues and current political and legal realities. Twenty-first century water governance requires a more collaborative approach where all governments, rights holders, communities and stakeholders in a watershed have roles and responsibilities for water management, with creative integration of top-down and bottom-up planning and decision-making. Successful implementation of a strong *Water Sustainability Act* will ultimately depend on such a partnership between the Province, First Nations, federal and local governments, water licence holders, and community and watershed organizations—all coming together to take leadership in and responsibility for water stewardship. In particular, British Columbia cannot have a functional water law regime until First Nations are involved in a substantial and meaningful way.

Sustainable Resourcing

Going hand in hand with implementing effective regulations is ensuring sufficient funding for the people and programs that will bring them to life. Professional staff, water managers, scientists, data experts, on-the-ground capacity, and compliance and enforcement officers, supported with sophisticated and modern programs, will make it possible to realize the many promising new features in the Act. Sustainable funding is a necessary precondition for effective implementation. Water rentals will provide an important part of the required resources, and therefore the Province must implement a regular, periodic review of the water licence pricing and rentals regime to ensure the revenue obtained from water use is sufficient to fully fund implementation of the Act.

Keys To Success: Core Regulation Areas in the *Water Sustainability Act*

The POLIS team has identified five regulatory areas as the necessary elements to make the *Water Sustainability Act* truly sustainable rather than just an updated version of the previous *Water Act*.

1. Groundwater: Protecting British Columbia's Buried Treasure

When the Province brings the *Water Sustainability Act* into force it will license and apply pricing to non-domestic groundwater use for the first time.

Two outstanding concerns with the proposed groundwater licensing regulation that must be addressed are:

CHECKLIST FOR SUCCESSFUL GROUNDWATER REGULATIONS

- Address Aboriginal water rights and consultation obligations.
- Obtain more information about British Columbia's groundwater resources and make it publicly available.
- Make groundwater licences conditional and subject to review, with fixed end-dates.

1. No legislative requirement exists for the Province to overtly consider Aboriginal water rights and title when issuing groundwater licences.
2. It will give priority to existing groundwater users with no provision for assessing the cumulative impacts of existing groundwater extraction on aquifer and connected surface water flow sustainability.

2. Environmental Flows: Ensuring Aquatic Ecosystems Survive and Thrive

Environmental flow regimes provide the foundation for healthy and functioning rivers, streams, lakes, and aquifers and the human communities that depend on these ecosystems. Leading jurisdictions protect environmental flow regimes through specific standards and regulations. This approach ensures that the process for considering flows is transparent with ecological baselines readily available to the public, and thresholds that are ultimately enforceable.

CHECKLIST FOR SUCCESSFUL ENVIRONMENTAL FLOWS REGULATION

- Protect environmental flows through regulation and policy.
- Establish regional environmental flow regime standards and critical flow thresholds.
- Evaluate the cumulative impact of new (and existing) licences.

3. Monitoring and Reporting: Building a Foundation for Better Decision-making

Systematic water monitoring and regular water use reporting are essential to assess aquatic ecosystem status, measure changes in quality and quantity, and build an accurate picture of existing water diversions in relation to water availability. Ultimately, for monitoring and reporting regulations to be robust and effective, they must require licence holders to play a more substantial role in data collection, including providing baseline data on water quality and quantity, and monitoring withdrawals and regularly reporting that information to the Province.

CHECKLIST FOR SUCCESSFUL MONITORING AND REPORTING REGULATIONS

- Require all licence applicants to submit baseline flow and quality data and all water users to monitor water withdrawals and flow, and report that data to government.
- Require additional detailed monitoring and reporting information in water scarce areas through water sustainability plans or area-based regulations.
- Establish a publicly accessible water-use database and follow-through on the commitment to produce annual "state of our water" reports.

4. Water Objectives: Integrating Water Issues into Land and Resource Use Decisions

Land use activities in British Columbia, including mining, forestry, hydraulic fracturing, and agriculture, have an array of impacts on water quality and quantity. The *Water Sustainability Act* has the potential to better integrate water issues into land-use decisions through the new authority it creates to set water objectives through regulations.

CHECKLIST FOR SUCCESSFUL REGULATIONS ON WATER OBJECTIVES

- Develop strong and meaningful water objectives that are specific and measurable, required for consideration by all relevant decision-makers, and ecologically significant.
- Conduct regular reviews of water objectives.
- Designate an independent third-party entity to periodically conduct audits and evaluate whether objectives are being met.

CHECKLIST FOR SUCCESSFUL PLANNING AND GOVERNANCE REGULATIONS

- Develop and implement three binding water sustainability plans in the first five years of the Act coming into force, in partnership with First Nations as leaders and in co-governance roles.
- Commit adequate resources to develop and implement water sustainability plans.
- Pilot shared decision-making governance models.

5. Planning and Governance: Preparing British Columbia For a Sustainable Future

Although many types of water and watershed plans exist in British Columbia, most are not legislated and difficult to enforce. Water and watershed planning is critically important for long-term water stewardship and to articulate a sustainable vision for the watershed and its future uses. Enforceable watershed-based plans in British Columbia can provide an opportunity for preventing and mediating conflicts, protecting ecosystems, and responding to future water uncertainties. The *Water Sustainability Act* includes a comprehensive planning regime with water sustainability plans – and their ability to provide tailor-made solutions to specific regional issues – at its core.

Critical to success is not only to develop such plans but also to implement them on the ground. Governance – the processes of decision-making and provisions for holding those making decisions accountable – provides this important link to translate plans from paper into action. The *Water Sustainability Act* contemplates the possibility of shared and delegated decision-making that offers significant potential for improved partnerships, co-governance with First Nations, and innovative decision-making going forward.

Water Law Reform as Part of a Bigger Picture

Fully implementing the *Water Sustainability Act*, including ensuring sufficient funding and making a fundamental shift towards a new partnership of risk and responsibility, is an important step towards improving water stewardship and water governance in British Columbia. The Province must continue to engage key stakeholders, rights holders and the public in a transparent ongoing process while regulations are developed. In the broader context, implementing the *Water Sustainability Act* is only the first step on a much longer path. British Columbia will ultimately need to continue to evolve its water law regime and approach to governance to ensure water resources are sustainably managed and that water is shared equitably now and into the future.

1. Introduction: Getting British Columbia's New Water Law Right

1.1 Report Purpose and Overview

Protecting fresh water is a growing priority in British Columbia due to its fundamental importance to ecological health and its central role in sustaining communities and economies across the province. British Columbia has a once-in-a-lifetime opportunity to significantly improve its water law regime. Escalating concerns such as droughts, floods, and river, stream, and aquifer degradation as well as conflicts over water use, underscore the urgent need for a comprehensive change to water management and the supporting legal structure.

In May 2014 the Province enacted the new *Water Sustainability Act (WSA* or "Act"), which replaced the 106-year-old *Water Act*. The WSA will be the cornerstone of British Columbia's new legal framework for water. The Act provides an unprecedented opportunity to fully modernize British Columbia's water laws, adding the tools necessary to manage and govern today's increasingly complex water issues, and to anticipate and proactively address tomorrow's water challenges.

Effective regulations are essential to fully implementing B.C.'s *Water Sustainability Act*. This report sets out the actions for regulatory development in the key areas of groundwater licensing, environmental flows, monitoring and reporting, water objectives and planning and governance to ensure a complete and effective regime. Specifically, this report:

1) Provides an analysis of the *Water Sustainability Act* and the core regulations required to bring its sustainable aspects into full effect;
2) Emphasizes the need for a new partnership approach between governments, First Nations, licensees, community, and other stakeholders to water governance in British Columbia; and
3) Offers clear recommendations for the development of core *WSA* regulations based on worldwide best practices.

This introductory section provides contextual background for the analysis and recommendations provided in the report. It includes a brief overview of the emerging water issues and conflicts across British Columbia that demonstrate the pressing need for a robust *Water Sustainability Act* and supporting regulations. The Introduction closes with a discussion of

a critical governance shift that must take place for the *Water Sustainability Act* to succeed: a move away from the existing centralized approach under the *Water Act* to a partnership of shared risk and responsibility among governments, communities, rights holders and all other stakeholders.

Section 2, *Keys to Success: Ensuring Robust and Effective Regulations*, forms the main body of this report. It provides an analysis of five regulatory areas that the POLIS team identified as the necessary elements to make the *Water Sustainability Act* truly sustainable[i] rather than just an updated version of the previous *Water Act*. These are:

1) Groundwater;
2) Environmental flows;
3) Monitoring and reporting;
4) Water objectives;[ii] and
5) Planning and governance.

Section 2 profiles best practice examples from other jurisdictions where innovative regulatory models are in place. Each focus area includes a "checklist for successful regulation" that provides the provincial government with specific recommendations for the development of WSA regulations in the context of British Columbia's issues and challenges, and based on worldwide best practices.

Finally, Section 3, *Next Steps: Water Law Reform as Part of a Bigger Picture*, summarizes key points and recommends next steps for moving forward with a vision for sustainable water law in British Columbia.

i A "sustainable" water management regime in this report means permitting the diversion of water for social and economic uses within the context of ecologically robust watersheds—water for nature—and hydrological adaptability.

ii The *Water Sustainability Act* water objectives are a new tool that can require land and resource use decision-makers in British Columbia to consider impacts on water when making their individual decisions (see box: *Clearing Up Confusion About Water Objectives* on page 29).

iii See Appendix A for further analysis and discussion of the *Water Sustainability Act's* key features.

1.2 British Columbia's New Water Law: An Overview

The *Water Sustainability Act* is the result of an extensive public engagement and law reform process driven by several commitments in British Columbia's 2008 Living Water Smart plan.

The *Water Sustainability Act* implements the law reform process outlined in the Living Water Smart plan. Recognized as a strong piece of environmental legislation, the Act includes promising features that have the potential to play a critical role in protecting and restoring British Columbia's fresh water.[4] Key elements of the Act include:[iii]

- Groundwater licensing;
- Formal environmental and critical flow protections;
- Enhanced monitoring and planning provisions;
- Improved land-water linkages through water objectives; and
- Possibility for shared and delegated decision-making.

The *Water Sustainability Act* is a framework, or enabling legislation, which means that the critical details of the legislation will necessarily be found in the supporting regulations. From a sustainability perspective, many of the most promising elements of the Act have yet to be developed in the regulations (see sidebar: *What are Regulations?*). The *Water Sustainability Act* will come into force in early 2016 through an initial phase of regulations; even then, many elements of the Act will depend on additional regulations not expected until late 2016 and early 2017. The first wave of regulations includes new groundwater licensing and revised administrative penalties (see *Figure 1 – The Future of B.C.'s*

KEY COMMITMENTS FROM LIVING WATER SMART – BRITISH COLUMBIA'S WATER PLAN

The Living Water Smart plan, released in 2008, was the first step on the path to creating British Columbia's new water laws.[1] This plan was across government and specifically supported by both the Ministry of Environment and the Premier; it sets out the Province's vision and commitment to ensure that British Columbia's water stays healthy and secure now and into the future.

The plan was driven by the need to adapt to a changing climate, respond to population growth and increasing resource development, and increase water use efficiency.[2] It contains 45 specific action commitments and targets, including the following:[3]

- Legislation will recognize water flow requirements for ecosystems and species.
- By 2012 the Province will regulate groundwater use in priority areas and large groundwater withdrawals.
- Government will support communities to do watershed management planning in priority areas.
- By 2012 government will require all large water users to measure and report their water use.
- Government will require more efficient water use in the agricultural sector.
- Government will continue to work toward preserving First Nations' social and cultural practices associated with water.
- Government will publish a "state of our water" report by 2012, and every five years after that.

Water: A Timeline of the Development and Implementation of the Water Sustainability Act on page 4). The impact of these future regulations will determine whether the Act has a real impact on the protection of British Columbia's fresh water.

Going hand in hand with the right regulations is sufficient funding for the people and programs that will bring them to life. Professional water managers, such as field staff, scientists, enforcement officers, planners, monitoring and data experts, and hydrologists, will make it possible to realize the many promising new features in the Act, including groundwater protection, monitoring and reporting, environmental flow protection, water objectives, water sustainability plans, and shared governance. Sustainable funding will be a necessary precondition for effective implementation. Water rentals will provide a critical source of the required resources. This role for water rentals is consistent with a user-pay principle and therefore requires the Province to implement a regular, periodic review of the water licence pricing and rentals regime to ensure the revenue obtained from water use is sufficient to fully fund implementation of the Act.

The Province showed strong leadership throughout the first phases of the *Water Act* modernization process that began in 2009, including providing numerous opportunities for public engagement. The Province must continue to provide these

WHAT ARE REGULATIONS?

Regulations are secondary or "subordinate" pieces of legislation that set out additional detail to specify how a law will be interpreted and applied. Regulations generally contain substantive details and specific thresholds.[5] Provincial and federal governments can only create regulations if a law, called an "enabling Act," expressly authorizes their creation. For a regulation to be valid, its content must align with what the enabling Act authorizes.[9]

An example using the *Water Sustainability Act* is that decision-makers must consider environmental flow needs before issuing new licences. A regulation can establish how a decision-maker will consider environmental flows and might include necessary detail about how to calculate those environmental flow needs.

Figure 1. The Future of B.C.'s Water: A timeline of the development and implementation of the *Water Sustainability Act*. *Content adapted from government sources including Ministry of Environment Proposed Water Policies documents (July 2015).*

opportunities throughout the development and implementation phases of regulation to ensure that they receive the benefit of robust public discussions and enhanced buy-in so that the *Water Sustainability Act* realizes its full potential as a law that protects British Columbia's fresh water.

1.3 The Changing Waterscape and British Columbia's Water Regulations

Media headlines and court and tribunal cases from across British Columbia reveal the many challenges and conflicts associated with the existing outdated *Water Act* and management regime (see Appendix B: *British Columbia's Emerging Water Issues*). These real-life situations emphasize why it is crucial that the *Water Sustainability Act* is fully implemented. For example, in the last two decades, British Columbia has faced an increasing number of droughts, floods, and a host of other water issues, including conflicts over water use, streams running dry, declining aquifer levels, and degraded watersheds.

In 2015 alone, several regions in British Columbia experienced pronounced water shortages.[7] Heritage rivers such as the Cowichan River on Vancouver Island had some of the lowest flows in recent memory.[8] Several regions of British Columbia faced fishing closures due to warm water temperatures and low flow conditions, which put fish stocks in jeopardy.[9] Throughout the summer of 2015, reservoir levels also rapidly declined in several areas: Metro Vancouver's reservoir storage dropped below its normal range in July,[10] and Campbell River reservoir levels reached historically low and critical levels.[11] All of these challenges, and the inevitable conflicts that follow, point to the urgent

need for new approaches to both manage and share water.

The box *Mounting Water Concerns in British Columbia* highlights a number of compelling and significant concerns from our review of water issues in British Columbia (these are also profiled in Appendix B: *British Columbia's Emerging Water Issues*). These examples, and many others across the province every year, clearly demonstrate the mounting inadequacies of the current regulatory approach, and align with the five priority areas proposed as solutions in the next section. Comprehensive new regulations in these areas have the potential to address existing concerns and avoid similar issues in the future. If British Columbia does not change its approach to freshwater management to respond to these realities, the consequences may be severe, as demonstrated by the experiences in Washington and California—and globally.[28] British Columbia is fortunate not to be facing the level of water crisis unfolding in the western United States; indeed, it is unlikely that in the near term it would face a province-wide drought at the scale of California's current state-wide emergency. However, the California situation may be an early warning, foreshadowing a possible future for certain regions of the province. British Columbia has the opportunity to learn from what is happening south of its border and to accelerate B.C.-specific programs to proactively address freshwater management.[29]

A comprehensive water law regime that includes a fully implemented *Water Sustainability Act* and a full suite of supporting regulations is a necessary condition to ensure that future water challenges in the province do not become debilitating water crises.

1.4 The Future of British Columbia's Fresh Water: The Need for New Partnerships for Management and Governance

British Columbia's current water governance regime is characterized by jurisdictional fragmentation and siloed decision-making processes, where decision-making authority resides almost exclusively with senior governments.[30] While the provincial government manages water as a resource, other related decisions about forestry, oil and gas, land development and water quality are made by staff in different provincial ministries and local governments with little, if any, coordination. Ecosystem needs and watershed health are only two of many considerations often weighed against economic and domestic delivery of water supply priorities. Canada's water law apparatus has also largely ignored Indigenous laws and principles. In this current system, First Nations, community groups, and watershed organizations have very limited authority, and water licence holders have minimal roles and responsibilities for stewarding the fresh water they access.

The existing top-down approach to water management largely ignores ecosystem needs and ecological priorities and does not align with the complexity of today's water issues. Water does not adhere to political boundaries as it flows across the landscape, and ecosystems are dynamic, governed by uncertainty and continual change. British Columbia's hydrological and geographic diversity includes watersheds encompassing a range of ecosystems from arid grasslands to coastal temperate rainforest. In the context of twenty-first century water challenges, senior governments simply do not have the capacity to be the exclusive decision-makers

MOUNTING WATER CONCERNS IN BRITISH COLUMBIA

Groundwater

The Hopington aquifer in Langley, B.C. is an important source of drinking water for the Langley Township and also provides irrigation water for the region's farms. However, due to increasing demand and thousands of long-forgotten artesian wells pumping millions of gallons of groundwater to the surface each year, the aquifer has been declining by approximately 30 cm per year for the past 30 years. The aquifer has lost so much water that some say it is "teetering on the point of no return."[12]

• • •

Nestlé's water bottling operation near Hope, B.C. has become a symbol of the concerns expressed by British Columbians about the unregulated use of B.C. groundwater. Over the last few years, a deluge of media coverage and province-wide public outrage have surfaced in response to Nestlé's ability to pump massive amounts of British Columbia's groundwater at no charge, which the company then bottles and sells back to consumers.[13] Local residents expressed concern that their shared water groundwater resource might be drained, while many more people across British Columbia criticized the Province's failure to regulate access to B.C. groundwater.[14]

Environmental Flows

In 2009 water levels in southern British Columbia's Nicola River were so low that kokanee salmon were trapped and could not travel upstream to spawn. There was a real risk that the salmon could disappear from the river altogether by the following year.[15] Although many ranchers voluntarily reduced their water diversions from the Nicola River to help the salmon, one rancher continued to withdraw river water for irrigation as per his licence.[16] The Province responded by issuing an emergency order under the *Fish Protection Act* requiring this rancher to cease his withdrawals for three weeks. This worked; once the diversion stopped, kokanee began swimming upriver once again.[17] The lesson here relates to the importance of regulatory protections for environmental flows: British Columbia can do better than react with individual orders, which can only be used when rivers are already in a state of severe crisis.

Monitoring and Reporting

In 1957 the Province granted a water licence to divert water from Fulford Creek on Salt Spring Island for industrial "fish culture" purposes under the condition that water diverted must be returned after use.[18] Over time, as the property was bought, sold, and subdivided, the original water licence transferred hands to a series of new owners who began using the water for different purposes, permanently removing water from the Creek. In 2005, the Ministry of Environment sent a request for a beneficial use declaration to the property owners and discovered that they were using Creek water for irrigation and to water cows (not the original purpose explicitly stated in the licence). Despite the sensitive nature of Fulford Creek, the Ministry did not act on that knowledge for five years. During that time, the land changed hands again, and the new property owners assumed that they could use the water for consumptive purposes. In 2010 the Ministry started enforcement proceedings and cancelled the water licence. The licence holders appealed this decision on the basis that they required the water for irrigating crops during the summer months, but were denied their appeal. This example illustrates the provincial government's lack of information about how licensees are using their water—even on fully allocated, sensitive streams—and the government's lack of resources to take action on known licence infringements.[19]

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Water Objectives

Freshwater quality and quantity across British Columbia are under growing pressure from a wide spectrum of land use activities. This is only expected to intensify according to B.C. Statistics, with 160 major natural resource development projects proposed in the province. This does not include many smaller proposals involving forestry, water, and oil exploration and drilling.[20] Stories from across the province show the array of cumulative threats to water from resource development and changing land uses:

- In northeastern British Columbia, hydraulic fracturing operations use and pollute massive quantities of water, with poor understanding of impacts on groundwater and interconnected surface water.[21]
- In August 2014 a tailings pond breach from the Mount Polley mine released 25 million cubic meters of contaminated water and mining waste into creeks and rivers in the Quesnel watershed.[22] One year later, the Mount Polley mine is operating again with a conditional permit, and still without a long-term water management plan in place.[23]
- For more than a decade, Sunshine Coast residents expressed concern about impacts of logging on their drinking water. In 2007 the Sunshine Coast Regional District temporarily halted logging in the Chapman Creek watershed based on concerns that it may pose a health hazard.[24]
- Significant algal blooms have appeared in Cultus Lake and Shuswap Lake, linked in part to nutrient inputs into the lakes from land-based sources such as agriculture.[25]

Planning and Governance

In September 2015, the provincial Environmental Appeal Board ruled in favour of the Fort Nelson First Nation and cancelled a water licence issued to the oil and gas company Nexen for fracking, citing that: a) the licence had been granted based on faulty science, and b) the Province's conduct was inconsistent with the honour of the Crown and the overall objective of reconciliation. On the latter point, the Panel noted, "…the Crown failed to consult with the First Nation in good faith. Based on the internal Ministry correspondence and the Manager's rationale, the Panel finds that by April 2012, the Manager intended to issue the Licence regardless of the promised meetings, and had no intention to substantially address any further concerns or information that may have been provided by the First Nation."[26] This approach to governance with disregard for Aboriginal rights is no longer legally acceptable. The Province must work with First Nations—as an order of government with constitutionally affirmed Aboriginal rights—to co-create water sustainability plans and processes of shared decision-making.

• • •

In early 2006, as a response to concerns about Langley's aquifers that provide roughly 80 per cent of the Township's water, the Province issued an Order for the Township to develop a water management plan (WMP) under Part 4 of the *Water Act*.[iv] In 2009, the Township submitted the final water management plan to the Ministry of Environment with the goal of ensuring safe and sustainable groundwater for the community for generations to come, projecting a 30 per cent reduction in groundwater use by 2020.[27] Unfortunately, this goal remains unrealized: Langley's water management plan, the first and only plan to be developed under Part 4 of the *Water Act*, has yet to be brought into force by regulation, and the Township has yet to implement its recommended activities, even though concern for the aquifer continues to this day.

iv Part 4 of the *Water Act* came into force in 2004, enabling the Minister of Environment to designate an area for a water management plan if such a plan would assist in addressing or preventing conflicts between water users or between water users and instream flow requirements, or preventing risks to water quality (*Water Act*, RSBC 1996, c. 483, s 62-s66). The Langley Water Management Plan specifically addressed aquifer depletion and risks to groundwater quality.

or water managers in the province. Neither can senior governments alone possibly keep on top of the real-time information needed to make water management decisions as seasonal and annual hydrological variability increases.

Current political and legal realities point to the need to reform approaches to water governance in British Columbia. In particular, the Supreme Court of Canada has clearly established that Aboriginal rights and title can no longer be ignored without significant legal implications. Simply put, British Columbia cannot have a functional water law regime until First Nations are involved in a meaningful way that respects their constitutionally-affirmed rights (see box: *Understanding British Columbia's True 'First-in-Time' Rights: Aboriginal Water Rights* on page 10).[v]

Twenty-first century water governance requires a more collaborative approach where all governments and stakeholders have roles and responsibilities, with creative integration of top-down and bottom-up planning and decision-making.[31] Successful implementation of a strong *Water Sustainability Act* will depend on such a partnership between the Province, First Nations, federal and local governments, water licence holders, and community and watershed organizations—all coming together to take leadership in and responsibility for water stewardship.[vi]

All partners will be required to contribute to the day-to-day management of freshwater resources, engage in long-term watershed planning, and provide ongoing appropriate local solutions to water-related issues as they emerge. More fundamentally, these partners will work together in each watershed under a shared risk and responsibility approach to water management and governance.

The partnership diagram on page 9 illustrates the concept behind this kind of relationship and partnership-based model. The series of smaller tributaries represent the key actors and their identified roles and responsibilities. These various tributaries flow into a larger metaphorical main water body that represent a modern management and governance approach. This approach changes the patterns of water use to better balance the needs of nature and the multitude of uses that exist in the watershed —a critical outcome as this kind of model becomes fully realized over time. This new model is characterized by core features that work together to create a very different kind of regime than currently exists, including:

- Shared risk and responsibility;
- Local solutions;
- Leadership for stewardship;
- Long-term watershed-based planning and decision-making; and
- Re-allocation of water for nature with sustainable outcomes.

A complementary water law regime is needed to ensure that the right incentives and institutional architecture exists to facilitate this shift to collaborative watershed governance. The *Water Sustainability Act* introduces new tools to enhance partnerships, and encourages a more serious approach to the stewardship of water. This includes new watershed planning processes (water sustainability plans), environmental flow protection, and the possibility for shared authority with other entities (See Appendix A: the *Water Sustainability Act in a Nutshell*).

v The need for the Province to work with First Nations in a meaningful way that respects their constitutionally protected rights is clearly illustrated in the Environmental Appeal Board's September 2015 decision to revoke Nexen Inc's water licence in part because the Province failed to consult in good faith with the Fort Nelson First Nation. See *Chief Gale and the Fort Nelson First Nation v. Assistant Regional Water Manager*, BC EAB Decision, 2012-WAT-013(c), 3 September 2015.

vi British Columbia's Northeast Water Strategy articulates one approach to this partnership concept. Unified water stewardship is one of the Strategy's core principles. This includes co-stewardship of water resources with First Nations and other partners, and also sharing of knowledge, research, and data between partners and between other overlapping water management activities in the region. See Government of British Columbia, *Northeast Water Strategy*, (20 March 2015) online: <http://www2.gov.bc.ca/gov/content/environment/air-land-water/water/northeast-water-strategy>.

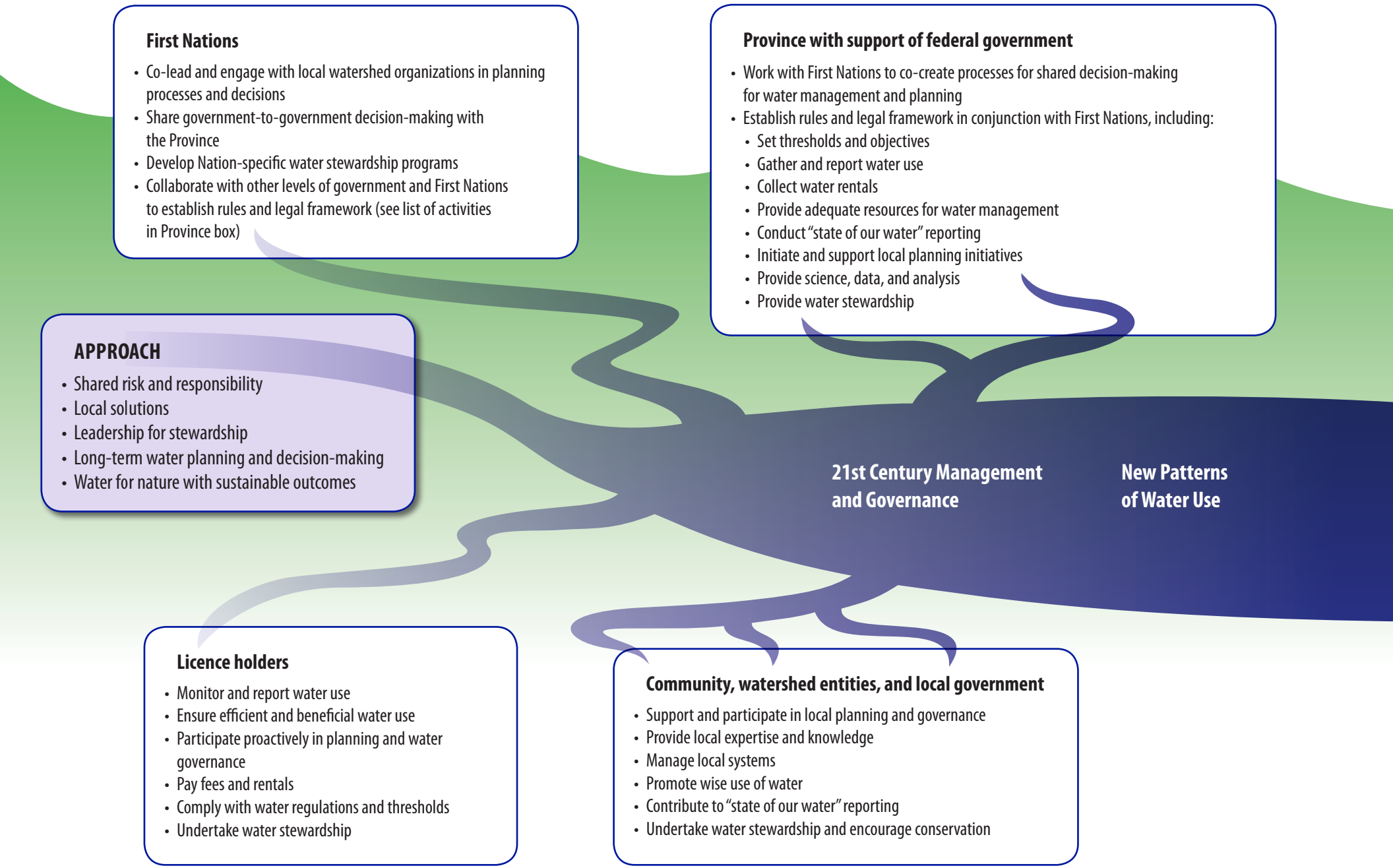


Figure 2. Partnership Model for British Columbia: Roles and Responsibilities

UNDERSTANDING BRITISH COLUMBIA'S 'FIRST IN TIME' RIGHTS: ABORIGINAL WATER RIGHTS

This report does not discuss Aboriginal water rights in detail; however, British Columbia's lack of recognition of Aboriginal water rights under the new *Water Sustainability Act* remains an outstanding concern.

Indigenous peoples have been using water the longest and, based on legal recognition of longstanding water use through the provincial "first in time, first in right" (FITFIR) system,[viii] Indigenous peoples should be entitled to the oldest water rights. Yet, when British Columbia developed its water law regime in the early 1900s, the provincial government did not consistently grant Indigenous peoples the most senior water rights in quantities that would secure their continued livelihoods.[32] More recently, British Columbia missed the opportunity to address this inequality in the *Water Sustainability Act* by not explicitly addressing outstanding Aboriginal water rights. The Province continues to assert Crown ownership over all water in British Columbia, which is problematic for many First Nations who have outstanding claims over the land and water of their traditional territories in the province.

The only provisions in the *Water Sustainability Act* that refer to any type of Aboriginal water rights are the few that acknowledge current and future water reservations agreed to as part of the treaty process.[33] So, although all new licence applications must be subject to the Province's requirement to consult and accommodate affected First Nations,[34] the provincial government has not provided a specific mechanism to acknowledge Aboriginal rights to water.[35]

Currently the Province fails to quantify and acknowledge Aboriginal water rights in the new regime or in each watershed's water balance and water diversion commitments under licence. This type of "exclusion solution" will not be legally feasible in the future as the law continues to evolve in its recognition of Aboriginal rights and title. Canada's legal landscape is constantly changing, and the recent Supreme Court of Canada decision, Tsilhqot'in Nation, illustrates this dynamism. The Tsilhqot'in decision confirmed that any provincial laws that operate to extinguish Aboriginal title are illegal.[36]

The Province's exclusion of Aboriginal water rights from the *Water Sustainability Act*, if unaddressed, may have future legal and operational repercussions for the provincial water law regime. This situation also creates a legal friction for all licensees as unquantified Aboriginal rights to water are not defined in any watershed's water budget. This lack of understanding about the extent of existing and future water entitlements amplifies uncertainty for licensing.

viii British Columbia allocates water according to a prior allocation system, also known as the "first in time, first in right." This is a priority ranking system based on date of licence issue: during times of scarcity, water licenses with the earlier priority dates are entitled to take their full water allocation over more junior licenses, regardless of the purpose for which the water is used.

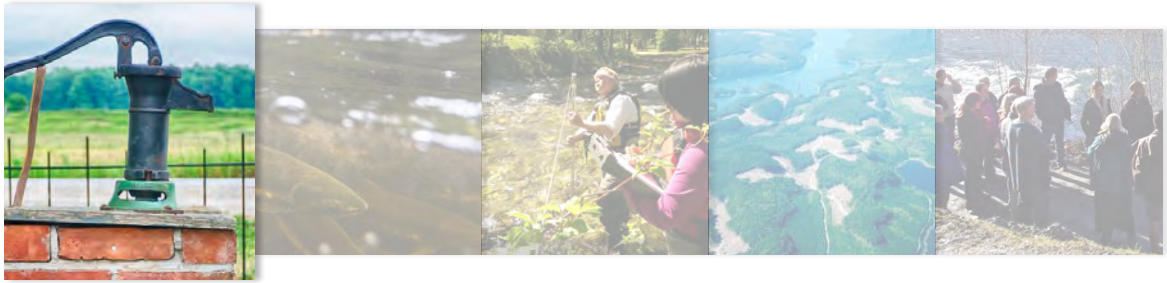
Clear lines of accountability and shared resources (human, financial, and informational) are needed to achieve this partnership approach to carry out management and implement decisions. While the range of possible roles, responsibilities, and relationships will go beyond the proposed partnership described here, it is clear that this model involves a host of actors and players interacting in new and creative ways. For example:

- **The Province** will work with First Nations to co-create processes for shared decision-making for water management and planning. In conjunction with First Nations, the Province will continue to play a central role in determining the overarching rules and legal framework; establishing principles and an approach to allocation; setting thresholds and objectives that reflect ecological realities; gathering information and reporting on water use; and ensuring oversight, accountability, and enforcement.
- **First Nations**, as an order of government with constitutionally-affirmed Aboriginal rights, will determine how to engage in partnerships to ensure both an effective process and better outcomes on the land (and in the water). This may include, but is not limited to, co-leadership and engagement with local watershed organizations in planning processes and decisions; shared government-to-government decision-making with the Province; specified roles and responsibilities through water sustainability planning; and developing Nation-specific water management functions such as monitoring and fisheries enhancement.
- **Licence holders**, with the entitlement to access and use water, will also take on responsibilities for monitoring, reporting, and stewardship, and will ensure efficient and beneficial use of the water they access. They will be stewards of the resource through proactive participation in water sustainability planning processes, new governance initiatives, and conservation activities; and will monitor and report on their actual water use. They will also support independent auditing and reviews, which help ensure that the information licence holders provide is accurate.
- **Communities, watershed entities, and local government** will be given opportunities to take part in local watershed planning and governance in meaningful ways. This will include developing visions for how their watersheds and local waters are used, setting goals and priorities, providing local expertise and knowledge for water stewardship, and ensuring follow-through as these choices and programs are ultimately implemented.[vii] They may take on key monitoring and adaptive planning roles as well as contribute to new governance bodies.
- **The federal government** will fulfill its constitutional responsibilities by supporting the provincial government to create the overarching structures for water governance. This includes managing federal lands such as parks, and regulating in the realms of fisheries, navigable and transboundary waters, and species at risk. They will also support the research and knowledge base needed to ensure evidence-based decision-making.

This report highlights the meaningful inclusion of all of these partners in British Columbia's future water governance structure as a precondition to the success of the *Water Sustainability Act*. This partnership model is reflected in the recommendations throughout this report.

vii For a detailed discussion of watershed governance models and principles, see: Oliver Brandes & Jon O'Riordan, *A Blueprint for Watershed Governance in British Columbia*, (Victoria, B.C.: POLIS Water Sustainability Project, 2014), online: <http://www.poliswaterproject.org/blueprint>.

2. Keys to Success: Ensuring Robust and Effective Regulations



KEYS TO SUCCESS: **GROUNDWATER**
Protecting British Columbia's Buried Treasure

DISCUSSION SUMMARY

1. The time has come to conserve groundwater and regulate its use as a vital resource to communities, the economy, fish populations, and healthy rivers, lakes, and streams. All British Columbians benefit from a managed resource. The "wild west" approach of taking groundwater wherever, whenever, and in whatever volumes one chooses, is no longer appropriate.
2. The Province is on the right track with its proposed groundwater regulations. However, more transparency is needed in the identification of priority areas of groundwater over-use and aquifer draw-down. The Province must focus attention on these areas to ensure that all parties use groundwater sustainably, mitigate conflict, and protect the environment and local economies.
3. The Province must address Aboriginal water rights and constitutional obligations.

Groundwater's Vital Importance

British Columbia's groundwater is vitally important. It is a source of drinking water for one in four British Columbians; it provides the pulse of cool, clean water for salmon to thrive; it is essential for many farms and local food security; and it supports the agricultural, energy, manufacturing, and industrial processes across the province that underpin the economy.[37] Many B.C. First Nations rely on groundwater for cultural and spiritual practices and to support their economic livelihoods.[38] During times of drought, groundwater is often the only water source helping to moderate water temperature and maintain base flows in rivers and streams, which sustain fish and wildlife populations.[39] Yet, despite groundwater's significance, the Province has never exercised its authority to regulate and license groundwater use.[ix] British Columbia will begin regulating groundwater with the *Water Sustainability Act*, making it the last province in Canada—indeed the last jurisdiction in much of the global north—to do so.[40]

How Will Groundwater Regulation Work?

Groundwater regulation is a centrepiece of the *Water Sustainability Act*. When the Province brings the Act into force it will license and apply pricing to non-domestic groundwater use for the first time. In July 2015 the Ministry of Environment publicly released its proposed approach to groundwater licensing and updates to the *Groundwater Protection Regulation.*[41] Key elements of how the proposed groundwater regime in the *Water Sustainability Act* will operate include:

- A prohibition on new diversions from an aquifer without a licence (s. 6) and a phasing-in of licensing for existing non-domestic groundwater users. Those currently diverting, using or storing groundwater may continue to do so until a regulation requires them to obtain a licence (s. 140).
- Regulations requiring irrigators, industries, waterworks, and others who currently use groundwater for non-domestic purposes to obtain their licences within a three-year transition period to secure their date-of-use priority.[42]
- Provisions exempting domestic well users[x] from all licensing requirements unless: a) a water sustainability plan is developed in their area requiring domestic well regulation, or b) the Province passes an area-based regulation requiring domestic well regulation.[xi]
- A process determining licence precedence amongst groundwater users according to the "first in time, first in right" system, and integrating groundwater licensees into the existing surface water allocation system. Groundwater users with the earliest historic date of first water use will have priority over more junior surface or groundwater users.

Concerns about British Columbia's Proposed Approach to Groundwater Regulation

Although the Province has committed to licensing all non-domestic groundwater users, and amendments to the *Groundwater Protection Regulation* include new requirements for proper well maintenance and controlling artesian flows, three outstanding concerns with the proposed regime persist.

ix Although the *Water Act* contains provisions allowing the government to license groundwater through regulation (see s. 1.1), these provisions have never been implemented.

x Domestic water use is defined in the WSA as the use of water for household purposes in a private dwelling for drinking, food preparation, sanitation, fire prevention, providing water for pets and household animals or poultry, and irrigating a garden adjoining the dwelling. Non-domestic water use, which requires a licence, includes all other purposes listed in the Act, such as conservation, industrial, irrigation, land improvement, mineralized water, mining, oil and gas, power production, storage, and waterworks (s. 2). See also B.C. Ministry of Environment, Licensing Groundwater Use Under British Columbia's *Water Sustainability Act*, online: <http://engage.gov.bc.ca/watersustainabilityact/files/2015/07/LicensingGroundwaterUse-Web-Copy.pdf>.

xi Domestic water users will be encouraged to register their wells in the provincial wells database so that government can consider potential impacts on domestic wells when granting new groundwater licences or amending existing licences. Domestic well owners will be deemed to have a water entitlement of up to 2,000 litres a day when the provincial government considers potential impacts on domestic uses. See B.C. Ministry of Environment, Licensing Groundwater Use Under British Columbia's *Water Sustainability Act*, online: <http://engage.gov.bc.ca/watersustainabilityact/files/2015/07/LicensingGroundwaterUse-Web-Copy.pdf>.

CALIFORNIA'S DEFINITION OF SUSTAINABLE GROUNDWATER MANAGEMENT

A common framework that defines clear and measurable sustainability criteria is necessary for effective groundwater management. California's *Sustainable Groundwater Management Act* provides a definition of sustainable groundwater management:

"The management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results."[49]

First, there is a lack of information and understanding about the interactions between groundwater and surface water in British Columbia, and about the total amount of groundwater available to be diverted.[43] Despite this situation, the proposed groundwater licensing regulation will give priority to existing groundwater users with no provision for assessing the cumulative impacts of existing groundwater extraction on aquifer and connected surface water flow sustainability. This could entrench unsustainable groundwater withdrawals.[xii]

Second, although the Province will be required to consult with individual First Nations about individual groundwater licences, no legislative requirement exists for the Province to overtly consider Aboriginal water rights and title when issuing groundwater licences. First Nations have voiced their concern that the "first in time, first in right" system for surface and groundwater neglects their Aboriginal rights.[44] This could have future legal and operational repercussions given First Nations' Aboriginal rights and title claims to British Columbia's water resources.[xiii]

Third, an important and often ignored issue in the *Water Sustainability Act* is the lack of explicit inclusion of saline groundwater in the groundwater regulation regime. Saline groundwater is hydrologically connected to fresh water in many areas, and is a valuable resource for various industrial uses, including hydraulic fracturing. Exempting saline groundwater from regulation is a potential barrier to effectively integrating surface and groundwater management.

Groundwater regulation represents a significant step forward for B.C. water law. As the Province refines its approach to groundwater regulation, it can learn from the experiences of other jurisdictions,[xiv] such as Ontario's approach to integrating surface and groundwater licensing, which includes a focus on environmental flows and sustainability (see box: *Ontario's Effective Integration of Surface and Groundwater Regulation* on page 15).

xii With respect to aquifer sustainability, a number of new provisions permit the regulation or limitation of groundwater use in certain circumstances, such as provisions related to mitigation measures, water sustainability plans, critical environmental flow protection orders, and fish population protection orders. See *Water Sustainability Act*, SBC 2014, c 15 s. 16, 83, 87, 88.

xiii For example, recent B.C. Supreme Court jurisprudence such as Halalt First Nation v B.C., 2011 BCSC 945 suggests that B.C. First Nations will be able to make claims for Aboriginal rights to water, including groundwater.

ONTARIO'S EFFECTIVE INTEGRATION OF SURFACE AND GROUNDWATER REGULATION

Ontario's water licensing system is a sound model for groundwater regulation. The system applies to both surface and groundwater, has clear thresholds, and an emphasis on sustainability. Key elements of this system are:

Specific licensing criteria that require decision-makers to consider environmental flows and sustainability in all licence decisions. When deciding whether to issue, amend, or cancel a surface or groundwater licence, decision-makers are required to consider the following:[45]

1. The impact of the proposed water diversion on natural variability of water flows or water levels, minimum stream flow, and habitat that depends on water flows or water levels.
2. The impact of the proposed water diversion on water quality and quantity, taking into account hydrological connectivity[xv] between surface and groundwater.
3. The potential to restore the hydrologic conditions and functions of the source watershed, and the impact of the diversion on sustainable aquifer yield.

No new or increased diversions in priority watersheds. In "high use" watersheds, Ontario prohibits new water licences for certain purposes, such as water bottling.[46]

Mandatory notification of new applications to municipalities and conservation authorities. A decision-maker who is considering a water licence application must notify relevant municipalities and conservation authorities, and can require the licence applicant to notify or consult with these bodies and other interested persons.[47]

Mandatory monitoring and reporting requirements. Since 2008 all licence holders are required to collect and record data on daily water diversion volume, and to report their water diversions to the Ministry of the Environment each year.[48]

xiv For a discussion of lessons that British Columbia can learn from California's groundwater law reform, see Randy Christensen and Oliver M. Brandes, California's Oranges and B.C.'s Apples: Lessons for B.C from California's Groundwater Reform. (Victoria, B.C.: POLIS Water Sustainability Project, 2015), online: <http://poliswaterproject.org/orangesapples>.

xv Hydrological connectivity refers to the interactions and linkages between surface and groundwater.

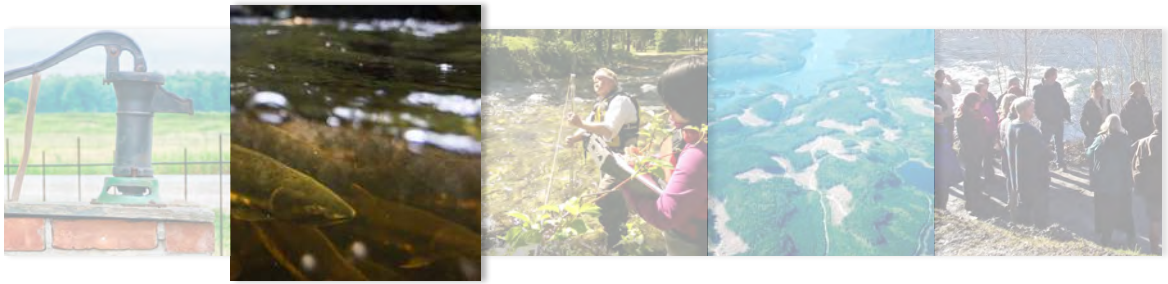
xvi Several different organizations collaborated on two documents outlining direction for WSA regulations: 1. *Environmental Sector Expectations for Regulations under B.C.'s Water Sustainability Act*, (June 2015) online: <http://poliswaterproject.org/publication/843>, and 2. *Environmental Sector Expectations for B.C.'s Groundwater Regulations,* (June 2015) online: <http://poliswaterproject.org/publication/844>. Oliver Brandes, Deborah Curran and Rosie Simms were key contributors to these documents, which provide a series of recommendations to the Province for WSA regulation development.

xvii The Ministry of Environment has developed a map-based aquifer classification system for the province. The system classifies aquifers on the basis of their level of development and vulnerability to contamination and provides ranking values for aquifers using hydrogeologic and water use criteria. See B.C. Ministry of Environment, *An Aquifer Classification System for Ground Water Management in British Columbia*, online: <http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/aquifers/Aq_Classification/Aq_Class.html>.

CHECKLIST FOR SUCCESSFUL GROUNDWATER REGULATIONS

As the Province finalizes the groundwater regulations, it has the opportunity to address the gaps in the proposed approach and to ensure the new system comprehensively protects groundwater resources. The following checklist builds on the *Environmental Sector Expectations for B.C.'s Groundwater Regulations*[xvi] and is informed by real-world situations and leading examples; it provides specific recommendations on how the Province can make B.C. groundwater regulations most effective:

1. **Address Aboriginal water rights and consultation obligations.**
   - ✓ Acknowledge and quantify Aboriginal rights to groundwater when determining groundwater licences.
   - ✓ Collaborate with individual First Nations to determine protection for Aboriginal water rights and uses.
   - ✓ Work with First Nations to determine an agreed-upon process for addressing the Province's constitutional obligations to consult and accommodate First Nations on individual groundwater licences.
2. **Obtain more information about British Columbia's groundwater resources and make the information publicly available.**
   - ✓ Complete the classification of British Columbia's aquifers.[xvii]
   - ✓ Characterize priority aquifers (i.e. carry out detailed studies such as three-dimensional mapping) to better understand the aquifer and surrounding watershed and recharge area, and make this information publicly available.
3. **Apply strict licensing conditions in priority aquifers.**
   - ✓ Designate at-risk priority aquifers, requiring domestic users to obtain licences, stringent licence conditions on withdrawals, and water sustainability plans or area-based regulations.
4. **Ensure sustainable groundwater use.**
   - ✓ Define sustainable groundwater management.
   - ✓ Include saline groundwater in the licensing regime.
   - ✓ Set specific quantitative objectives for groundwater quality and quantity.
   - ✓ Determine a water budget for each hydrological system (i.e. aquifers and surface water sources); set numerical limits for withdrawals; and define full basin allocation, at which point no new licences may be granted.
5. **Make groundwater licences conditional and subject to review, with fixed end-dates.**
   - ✓ Issue initial licences with five- to 10-year specified end-dates until it is established that current extractions are sustainable and the cumulative impacts of existing extractions do not pose a threat to environmental flow needs.
   - ✓ Establish clearly defined licence review periods of 25 years generally and 10 years in identified priority or at-risk watersheds.
6. **Assign monitoring and reporting responsibilities to licence holders and require well registration.**
   - ✓ Require licence applicants to submit baseline data on aquifer conditions, including water quality and quantity.
   - ✓ Require licensees to monitor and report actual water use including monthly, annual, and peak amounts.
   - ✓ Require all well owners to register their wells in the Provincial Wells Database.



KEYS TO SUCCESS: **ENVIRONMENTAL FLOWS**
Ensuring Aquatic Ecosystems Survive and Thrive

DISCUSSION SUMMARY

1. **Protecting environmental flow regimes—including lake levels and groundwater—is crucial to protecting fish populations and freshwater ecosystems.**
2. **Protecting environmental flow regimes involves not only ensuring sufficient water quantity is retained in lakes, rivers, and streams for aquatic organisms and river-dependent wildlife and plants, but also maintaining other vital stream functions related to water quality, biology, geomorphology, and connectivity across time and scale.**
3. **An environmental flows regulation, not just a policy, is the best way to provide adequate clarity, transparency and, ultimately, protection for watersheds and ecosystems.**

The Need to Protect Environmental Flows

Environmental flow regimes provide the foundation for healthy and functioning rivers, streams, lakes, and aquifers. They are also critically important for the human communities that depend on these ecosystems—sustaining fisheries, recreational activities, and providing clean drinking water supplies.[50] Environmental flow regimes encompass a mixture of elements including hydrology, ecology, water quality, and physical structures. Creating a legal regime that protects all facets of environmental flows is a complex process (see box: *Understanding Environmental Flows* on page 18).

Despite the importance of environmental flows, until the introduction of the Water Sustainability Act, they received only limited protection in British Columbia's water laws—through regional policies or narrow mechanisms related to fish protection (e.g. the *Fish Protection Act*). The existing *Water Act* does not require decision-makers to consider environmental flows in water allocation decisions and there is conflicting evidence on the extent to which decision-makers across the

province address environmental flows requirements and enforcement.[xviii] Living Water Smart, the Provincial water policy, expressly recognizes the need for rigorous and binding legal protection for environmental flows. Updating British Columbia's water legislation to ensure environmental flows are legally protected is one of the most important contributions of the *Water Sustainability Act*.

Legally, it is important to distinguish between environmental flow regimes and critical environmental flow thresholds.[xix] Environmental flow regimes support aquatic ecosystems to thrive, while critical flow thresholds are the minimum flows for aquatic ecosystems to survive. Both aspects must be included in an appropriate management and protection regime.

How Will Environmental Flow Protections Work under the *Water Sustainability Act*?

The *Water Sustainability Act* currently defines environmental flows more narrowly than the accepted definition in leading thinking and practice. The Act defines environmental flows as: "the volume and timing of water flow required for the proper functioning of the aquatic ecosystem of the stream."[72] This definition is limited insofar as truly protecting flows requires protecting more than just a river's hydrology; it must also address water quality and other structural or land-based aspects of environmental flows. To ensure that a river remains healthy it is necessary to preserve all five riverine components: a river's hydrology; water quality; geomorphology; biology; and its lateral, vertical, longitudinal, and temporal connectivity.[54]

UNDERSTANDING ENVIRONMENTAL FLOWS

"Environmental flows describe the quantity, quality, and timing of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on those ecosystems."

—Brisbane Declaration[51]

According to a report from the Department of Fisheries and Oceans (DFO) – Canadian Science Advisory Secretariat: *"The scientific literature supports natural flow regimes as essential to sustaining the health of riverine ecosystems and the fisheries dependent on them. Riverine ecosystems and the fisheries they sustain are placed at increasing risk with increasing alteration of natural flow regimes … [T]he assessment of alterations to the flow regime should be considered in a cumulative sense, and not only on a project-by-project basis."*[52]

The Brisbane Declaration definition and DFO analysis highlight the importance of protecting environmental flows, which involves several cumulative elements, and the recognition that aquatic ecosystems need varying water flows seasonally and over time to function properly and ensure ecological resilience.

xviii In the South Okanagan, for instance, 235 of 300 streams are fully allocated, while more rigorous protections for environmental flow needs exist for streams on eastern Vancouver Island.

xix Critical environmental flow thresholds are defined in the WSA as "the volume of water flow below which significant or irreversible harm to the aquatic ecosystem of the stream is likely to occur" (s. 1(1)).

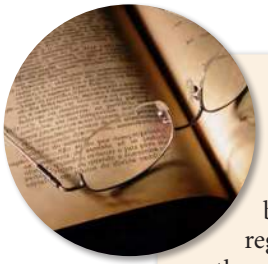
Notwithstanding the limited definition of environmental flows, the *Water Sustainability Act* introduces several new legal mechanisms that together create a regime to better protect environmental flows in British Columbia, including the following requirements and powers:

- Decision-makers must consider the environmental flow needs of streams in future surface water and groundwater licence decisions or licence reviews (s. 15).
- Decision-makers may require mitigation measures if a proposed diversion or water use, or changes in and about a stream, have significant adverse impacts on water (s. 16-17).
- Cabinet may establish objectives for the purposes of sustaining water quality, quantity, and aquatic ecosystems (s. 43).
- Water sustainability plans can reduce the amount of water that licensees may divert under a licence (s. 79).
- The Minister or Cabinet may declare a significant water shortage, and the comptroller may make critical environmental flow orders (s. 86-87).
- The Minister may issue a fish population protection order when low flows threaten the survival of a population of fish (s. 88).
- Cabinet may make regulations respecting sensitive streams (s. 128).
- The Minister may make regulations that prescribe methods for determining the environmental flow needs of a stream (s. 127(1)(o)).

Multiple mechanisms are needed—combining methods and strategies—to create a protective net for all aspects of environmental flows. By introducing these changes, British Columbia joins many other jurisdictions that have already developed water allocation systems that recognize environmental flows as a prerequisite to allowing water diversions, and that prioritize ecosystem water needs (see box: *Prioritizing Environmental Flow Needs in Northern Territory, Australia* on page 20). The inclusion of environmental flows in the *Water Sustainability Act* is a promising step towards protecting ecosystem health. However, as outlined in the remainder of this section, additional safeguards are needed to ensure a truly robust environmental flows regime, including clear requirements for monitoring and enforcement. In addition, the Province has yet to commit to regulating environmental flow needs as opposed to relying on a policy-based approach (see sidebar: *Policy versus Regulation*).

Debate continues about the trade-offs between enforceable standards (including express water volume thresholds) secured through regulation and unenforceable guidelines established through policy. The public provided significant feedback on this issue during the *Water Act* modernization process. In particular, environmental non-governmental organizations (NGOs) generally emphasized that standards, or regulations, are preferred as they provide the necessary clarity, transparency, enforceability, and ultimately rigorous protection that weaker guidelines (or policy) do not.[62]

Defining environmental flow regime needs and specific standards through regulation can ensure that the process for considering flows is transparent, ecological baselines are readily available to the public, and environmental flow regimes standards and water volume thresholds are



POLICY VERSUS REGULATION

The distinction between policy and regulation is important in the context of the Province's approach to protecting environmental flows.

Policy typically refers to a course of action that an actor (such as a government) adopts and follows to deal with an issue or matter of concern.[61] A policy provides *guidelines* for government decision-making. Thresholds and standards set in a policy are not enforceable as they are not law. Thus, typically a policy is not legally binding.

Regulations, on the other hand, are enforceable laws. They set out legally enforceable standards (see also box: *What are Regulations?* on page 3). Decision-makers are required to adhere to a regulation; if they do not, affected parties may be able to legally challenge their decisions as contravening regulation.

ultimately enforceable. It is not sufficient to simply *consider* environmental flows. Clear language must specify licence requirements, and decision-makers should not issue licences in circumstances where the licences may negatively impact defined environmental flows. A decision-maker should refuse any licence application that would have a lasting negative effect on an aquatic system. The regulation must provide guidance, but "one size does not fit all," therefore the regulation must contain some flexibility to ensure appropriate local solutions. Ultimately, policy *and* regulation need to work together for any program to be successful.

PRIORITIZING ENVIRONMENTAL FLOW NEEDS IN NORTHERN TERRITORY, AUSTRALIA

Australia's Northern Territory has an innovative environmental flow regime that prioritizes protection for the aquatic environment above entitlements granted to licence holders. In the Northern Territory, the regulatory regime is based on basin-specific water allocation plans.[55] The Katherine Tindall Limestone Aquifer Water Allocation Plan (the "plan")[56] is a leading example of a progressive approach to environmental flows.

The Katherine and Daly Rivers rely on groundwater discharge from the Tindall Aquifer to maintain year-round flows and support ecosystem function. The plan sets a specific limit on the percentage of groundwater discharge—from the Tindall Aquifer to the two rivers—that must be preserved for environmental outcomes. *After* this environmental flow is secured, the State distributes the remaining volumes of groundwater among licence holders.[57]

The amount of water set aside for environmental flows varies each year depending on how the year is classified according to the amount of annual precipitation. Years can be classified as *very dry, dry,* or *normal/wet*. For example, a year will be classified as *very dry* when the amount of water passing a particular measurement point is lower than the lowest amount of recorded flow in 90 per cent of years on record. In a *very dry* year, 87 per cent of the annual groundwater discharge from Tindall Aquifer must be reserved to support environmental flows. In *dry* years the percentage is 80 per cent, and in *normal/wet* years the percentage is 70 per cent. The leftover percentage is allocated to existing licence holders.[58] This annual classification can mean a possible variability in permissible aquifer water withdrawals between only 4,340,000 litres per year in *very dry* years up to a maximum of 35,631,000 litres per year in *normal/wet* years. The lower number for *very dry* years is calculated to ensure that sufficient water is still available to supply essential water demands such as public water supply, and rural stock and domestic requirements. However, extraction for agriculture, aquaculture, and industry is reduced to zero during *very dry* years.[59]

This innovative plan is heralded as a success and has led to several immediate benefits, including protection of groundwater-dependent ecosystems in the area, such as the Katherine Hot Springs.[60]

xx The Coast Information Team (CIT) is one possible model for an independent scientific body for environmental flow determination. The CIT was an independent scientific advisory body that informed the Great Bear Rainforest Agreements. This body had the goal of producing scientific information and a common data set approved by all parties. By creating a separate scientific advisory group, land use negotiations and decision-making were separated from debates over science itself. Conflicts over science did not cease but rather did not paralyze the broader land use planning process. See: Roger Clapp and Cecelia Mortenson, "Adversarial Science: Conflict Resolution and Scientific Review in British Columbia's Central Coast" (2011) 24:9 *Society & Natural Resources* 902.

xxi This works best when an accurate hydrologic model has been developed for the river/aquifer of concern. Regulators can then use the model to simulate the impacts of additional licences (Brian Richter, personal communication, September 23, 2015).

CHECKLIST FOR SUCCESSFUL ENVIRONMENTAL FLOWS REGULATION

The following checklist includes key elements of an effective environmental flows regulation that would protect British Columbia's fish and aquatic ecosystems:

1. **Protect environmental flows through regulation and policy.**
   - ✓ Establish legally enforceable environmental flows regulation.
2. **Establish regional environmental flow regime standards and critical flow thresholds.**
   - ✓ Establish a presumptive standard to protect environmental flow regimes that applies across the province, and codify the standard in the environmental flows regulation (see box: *Science in a Box: Setting Presumptive Standards to Provide Interim Protection for British Columbia's Rivers and Streams* on page 22).
   - ✓ Set regional or priority area environmental flow standards and critical flow thresholds in water sustainably plans or area-based regulations, using independent science[xx] and based on the development of the provincial presumptive standards. In water scarce regions, these plans or area-based regulations may require a reduction in overall water diversion through licence amendments and/or by prohibiting new licences.
   - ✓ Regularly monitor and verify that environmental flow standards are successfully protecting fish and watershed health.
3. **Ensure timely compliance with licence restrictions when environmental flow regime standards are reached, and with emergency orders when critical flow thresholds are reached.**
   - ✓ Define the parameters of a "significant water shortage" as the trigger for the Minister to declare critical environmental flow orders.
   - ✓ Require all licensees to decrease water diversions—through stop orders—if a river or stream drops below its environmental flow regime standard; or include explicit water volume thresholds in licences.
   - ✓ Commence water sustainability planning or enact area-based regulations for those watersheds or specific water bodies that are consistently dropping below the flow regime standards and thresholds.
4. **Evaluate the cumulative impact of new licences.**
   - ✓ Use a consistent set of detailed and stringent criteria to evaluate the cumulative impact of any proposed new licence on environmental flow regimes.[xxi]
   - ✓ Only issue new licences if there is adequate evidence that additional water extraction will not exceed environmental flow regime thresholds, even during low flow conditions.
5. **Protect other aspects of environmental flows.**
   - ✓ Set objectives that provide specific thresholds to protect other aspects of environmental flow regimes such as water quality, geomorphology, biology (including riparian needs), and connectivity (longitudinal, lateral, vertical, and temporal).
6. **Establish a review mechanism.**
   - ✓ Review existing licences, starting with older and larger licences in priority regions, to include environmental flow protection requirements.
   - ✓ Mandate 30-year licence reviews in all areas where environmental flows are threatened.
   - ✓ Periodically update licence conditions and allocations as environmental flow regimes change in watersheds across the province.
   - ✓ Ensure protections for environmental flow regimes are reviewed and adjusted in light of new scientific understandings or documented hydrologic alterations associated with changing climate as part of water sustainability plan reviews or five- to 10-year regulation reviews.

SCIENCE IN A BOX: SETTING PRESUMPTIVE STANDARDS TO PROVIDE INTERIM PROTECTION FOR BRITISH COLUMBIA'S RIVERS AND STREAMS

Determining accurate site-specific flow thresholds for British Columbia's rivers and streams requires independent and rigorous science. In many places this detailed scientific work has not yet been completed. However, waiting until site-specific flow thresholds are established for every stream and river would significantly delay the protection of environmental flows and likely lead to over-allocations or inaction. Existing methods that provide rough estimates of environmental flow thresholds can be used to start protecting environmental flows immediately while local initiatives further refine their approach.

Scientist Brian Richter and colleagues have developed one method for roughly estimating optimal environmental flows. Richter's approach is based on a presumptive standard method, which involves maintaining flows within a certain percentage-based range of the natural flow regime.[84] Richter proposes a range of limits on flow depletions—based on percentages of the natural flow regime—that can help decision-makers estimate how much flow can be diverted from a river while still maintaining that river's ecological integrity (see Figure 3):

- Limiting daily flow depletions to no greater than 10 per cent of the natural flow regime will provide a high level of protection (the natural structure and function of the riverine ecosystem will be maintained with minimal changes).
- Limiting daily flow depletions to 11 to 20 per cent will provide a moderate level of protection (there may be measurable changes in structure and minimal changes in ecosystem functions).
- Flow depletions greater than 20 per cent will likely result in moderate to major changes in natural structure and ecosystem function.

Overall, Richter suggests that limiting daily flow alterations to 20 per cent or less is a conservative and precautionary way to provide interim environmental protection for rivers and streams. This conclusion includes several important caveats: the model may require adjustment for smaller streams; seasonal adjustments of the percentage of allowable flow alterations may be advisable; and rivers affected by hydroelectric dams warrant special consideration.

Richter is clear that models for site-specific environmental flow determinations are the preferred way to set environmental flow regimes. Continued investment in site-specific environmental flow assessments is a top priority. However, this type of model is often time- and cost-intensive to develop and implement. Until site-specific flow models can be applied everywhere, presumptive, risk-based environmental flow standards provide interim flow protection.

This presumptive approach is, of course, subject to critical flow cut-offs. For example, there should not be a 20 per cent reduction from a critical low flow level. In general, most practitioners would suggest something in the range of 25 to 30 per cent of mean annual discharge as the critical low flow cut-off. Diversions might still be possible as these critical flow thresholds are approached but more detailed analysis should be required to ensure long-term health and function of the riverine ecosystem.[64]

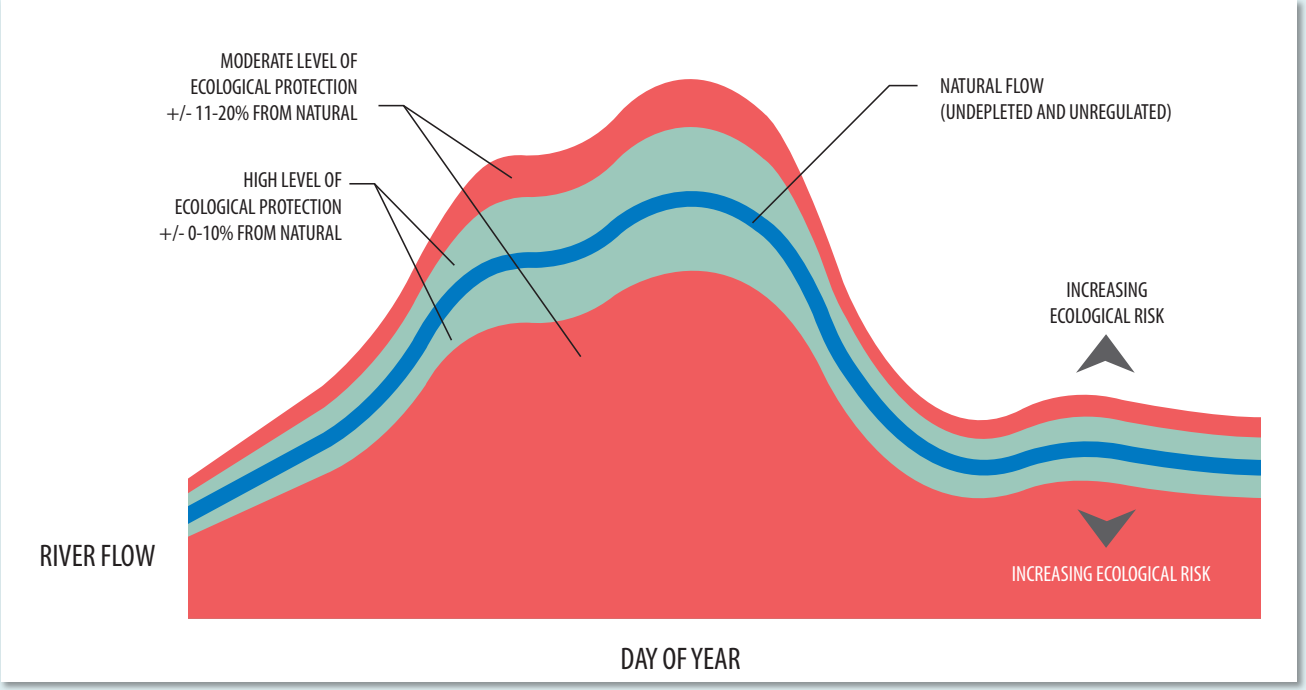
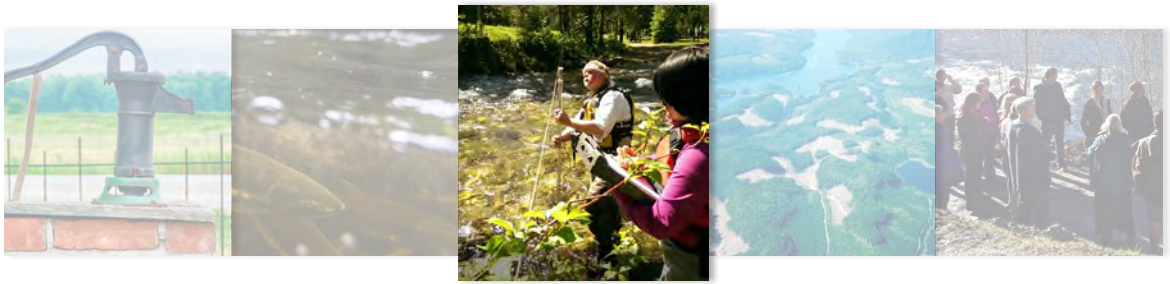


Figure 3. Richter's Presumptive Standard (Source: Brian D. Richter et al., "A Presumptive Standard for Environmental Flow Protection" (2012) 28:8 River Research and Applications 1312.)



KEYS TO SUCCESS: **MONITORING AND REPORTING**
Building a Foundation for Better Decision-Making

DISCUSSION SUMMARY

1. **Holding a water licence must involve monitoring and reporting responsibilities.**
2. **Government's role is to receive and confirm information from licensees and to use that information to ensure sustainable management decisions.**
3. **Many gaps in information about water in British Columbia exist, and these gaps must be filled to ensure effective management decisions that sustain and protect surface and groundwater.**

The Need for Monitoring and Reporting

The foundation of any successful water management regime includes monitoring water resources and reporting the results.[65] At the most basic level, it is not possible to manage something that is not measured. Systematic monitoring is essential to assess aquatic ecosystem status, measure changes in water quality and quantity, and identify emerging threats.[66] Regular water use reporting is critical to building an accurate picture of existing water diversions in relation to water availability.[67] With the state-of-the-art technology available today, it is possible to gather an immense amount of monitoring information and data with relatively little effort.[xxii] However, British Columbia has yet to adopt a substantial province-wide water use monitoring system.

xxii For example, the South Ontario Water Consortium runs an innovative pilot program on watersheds monitoring in three sub-watersheds of the Grand River that employs the cutting edge of monitoring technology. The initiative consists of a dense network of monitoring stations, which collect data on a number of climatic, hydrologic, and subsurface parameters. Each monitoring station is equipped with sensors for remote monitoring. Monitoring data is transmitted to a computational centre and is available on a real-time basis. Monitoring stations are used to evaluate sensitive municipal water withdrawals, agricultural land management, expanding urban development, and overall watershed dynamics.

The Province has limited information about how licence holders use water in British Columbia or about the overall health and quantity of British Columbia's water resources. For example, data are limited on the locations of British Columbia's aquifers and how much groundwater they contain.[68] The volume of water most licensees actually use is unknown; the only information available is how much water they are permitted to use under their licences.

The Environmental Appeal Board's September 2015 decision to cancel a water licence issued to the oil and gas company Nexen for fracking demonstrates British Columbia's water data deficiency. In its final decision, the Board noted: "the licence should be reversed because it is fundamentally flawed in concept and operation. It authorizes a flow-weighted withdrawal scheme that is not supported by scientific precedent, appropriate modelling, or adequate field data."[68] New regulations on monitoring and reporting enacted pursuant to the *Water Sustainability Act* can help fill these information gaps. This base of knowledge will be absolutely critical for decision-makers to make effective management decisions that protect surface and groundwater.

How Will Monitoring and Reporting Work in the *Water Sustainability Act*?

The *Water Sustainability Act* preserves and expands the discretionary authority set out in the *Water Act* to impose detailed monitoring and reporting requirements on water users. Authority that existed in the *Water Act*, such as the broad powers of engineers and officers to order monitoring and reporting, remain in the new Act.[70] The new monitoring and reporting requirements introduced in the *Water Sustainability Act* include:

- Licence applicants may be required to undertake studies and provide data to decision-makers assessing the impacts of the proposed licence on the environmental flow needs of a connected stream or aquifer (s. 15).
- Water users that affect groundwater or streams designated as "sensitive" may be required to measure and report water conditions as a requirement of their licence (s. 17).
- Most existing and new water licence holders can be required to submit to a 30-year licence review.[xxiii] As part of the review, licensees can be required to provide information, plans, and specifications and assessment reports, including a water conservation audit (s. 23).
- Licensees can be required to carry out a water conservation audit as part of a beneficial use declaration (s. 30) (see Appendix A on page 46 for more information on beneficial use declarations).
- Cabinet is granted the authority to enact a wide variety of regulations on measuring, testing, and reporting water use (s. 131). For instance, regulations can require that specific parameters are tested in water diverted from a stream or aquifer (s. 131(1)(e)).

As the Province develops its monitoring and reporting regulations, it can look to other Canadian territories and provinces that already have successful programs in place. For example, the Northwest Territories has a water monitoring and reporting system that requires licence applicants to submit detailed baseline data and licensees to annually report their actual water use (see box: *Monitoring and Reporting in the Northwest Territories* on page 26).

xxiii Specific exemptions from the review process extend to: a) licences issued for a hydroelectric purpose on or after October 2003; b) licences issued under the *Industrial Development Act*; and c) licences issued following a review under the water use plan directive published by government and dated December 1998 (s. 23(c)(d)(e)).

MONITORING AND REPORTING IN THE NORTHWEST TERRITORIES

The Northwest Territories (NWT) has established a comprehensive framework for water licence monitoring and reporting through the *Waters Act, Mackenzie Valley Resource Management Act,* and *Water Regulations*.

Licensees have significant monitoring and reporting responsibilities. For instance, the Mackenzie Valley Land and Water Board requires licence applicants to include a wide array of baseline data in their applications, including a description of the impacts of the proposed licence on:[71]

1. Groundwater and surface water, including changes to flow, quantity, and quality;
2. Land, including compaction, settling, erosion and riparian zone loss;
3. Vegetation and fauna, including species composition, abundance, and habitat;
4. Archaeological resources; and
5. First Nations' traditional land uses.

Licence applications are also required to describe the proposed management and remediation or mitigation measures related to potential licence impacts. Further, one of the major features of the licensing process is the inclusion of First Nations in decision-making. Licence applicants must inform and obtain feedback on the project from the First Nations and other communities in the project area in accordance with an Engagement and Consultation Policy.[95]

There are also requirements for mandatory annual water use reporting. Every licensee is required to submit a report each year of the actual volume of water used under the licence.[96] Licence information, including annual water use, is available to the public through an online public registry of active and closed water licences.[97]

CHECKLIST FOR SUCCESSFUL MONITORING AND REPORTING REGULATIONS

A strong monitoring and reporting regulation is a prerequisite to having sufficient information for defensible and sound water governance and decision-making. While the Province may collect some of this information, monitoring and reporting responsibility is also placed on those who benefit most from using British Columbia's water resources: water licence holders. The following checklist includes key elements of effective monitoring and reporting regulations:

1. **Require all licence applicants to submit baseline data.**
   - ✓ Require all licence applicants to submit baseline data on water quality and quantity as part of their licence applications.
2. **Require all water users to monitor water withdrawals and report that data to government.**
   - ✓ Require all water users to monitor their water withdrawals using approved devices, including monthly, annual, and peak levels; and to report that data to the Province (i.e. as the Oil and Gas Commission already does in northeastern British Columbia).[75]
   - ✓ Institute these requirements in stages, beginning with users in water scarce areas where water sustainability plans or area-based regulations are slated for development or are in place.
3. **Require more detailed monitoring and reporting information in water scarce areas through water sustainability plans or area-based regulations**
   - ✓ Create water sustainability plans or enact area-based regulations that require all users not only to monitor and report monthly water diversion, but also, where applicable, to monitor stream flow, groundwater levels, well performance, and water quality.
   - ✓ Ensure that water sustainability plans trigger an evaluation and intervention by the Ministry when actual water diversions exceed the amount set out in the plan (i.e. plans establish a water diversion threshold based on current conditions).
4. **Designate an independent auditor to audit licensee information.**
   - ✓ Require that an independent auditor periodically review the information that water users provide to the Province to ensure its accuracy and credibility.
5. **Establish a publicly accessible water-use database and follow-through on the commitment to produce annual "state of our water" reports.**
   - ✓ Create or support a publicly accessible province-wide water use database that encompasses all monitoring data from surface and groundwater users.[76]
   - ✓ Produce an annual "state of our water" report that organizes information on a watershed basis and includes aggregate water flow and diversion data, areas of concern, inter-annual comparisons, and changes based on the implementation of water sustainability plans.
   - ✓ Ensure that communities, licence holders, citizens, delegated governance entities, and other local bodies in charge of water sustainability plans have full access to the database and reports to inform decision-making.

KEYS TO SUCCESS: **WATER OBJECTIVES**
Integrating Water Issues into Decisions on Land and Resource Use

DISCUSSION SUMMARY

1. The *Water Sustainability Act* "water objectives" help guide land and resource use decision-makers and local governments to consider water when making approval decisions.
2. British Columbia's approach to water objectives in the *Water Sustainability Act* is unique and has potential to better integrate water issues into land use decisions. However, such environmental objectives have had limited success in other areas of law in British Columbia and in other jurisdictions. An important lesson British Columbia can learn from other jurisdictions and legislative examples is that water objectives must be specific and measurable.
3. British Columbia British Columbia must develop scientifically sound water objectives and thresholds; require all relevant decision-makers to consider water objectives.

The Need to Integrate Water Issues into Land Use Decisions

Land use activities in British Columbia, including mining, forestry, hydraulic fracturing, and agriculture, have had an array of impacts on the quality and quantity of freshwater resources. These impacts include disrupted hydrology,[77] algal blooms in lakes from nutrient inputs in runoff,[78] and contamination from tailings pond spills.[79] Given the cumulative impact of land use activities on British Columbia's fresh water, it is vital that decision-makers issuing permits and approvals for these types of activities consider the impacts on fresh water.

The *Water Sustainability Act* creates new authority to set water objectives. This represents an important step towards meeting the goal of better integrating water issues into land use decisions and ensuring a more coordinated and integrated approach to water management in British Columbia.[xxiv] Water objectives are a key tool British Columbia can use to respond to the recommendations set forth in the 2015 B.C. Auditor General's report on cumulative effects management. The Auditor's report calls on the Province to "[i]ntroduce tools, such as legislation and policy, that will enable all of the province's natural resource sector ministries and agencies to coordinate cumulative effects management across all the sectors."[80]

What are Water Objectives in the *Water Sustainability Act* and How Will They Work?

The *Water Sustainability Act* water objectives are a new tool that can require land and resource use decision-makers in British Columbia to consider impacts on water when making their individual decisions. The term "water objectives" is vague and can be interpreted in many different ways, which may cause confusion for stakeholders and decision-makers. This term is defined in a particular sense in the *Water Sustainability Act* (see box: *Clearing Up Confusion About Water Objectives*). The following key points from section 43 of the *Water Sustainability Act* outline how objectives will operate in this context:

CLEARING UP CONFUSION ABOUT WATER OBJECTIVES

***Water Sustainability Act* water objectives are:**

- **A new tool to integrate water issues into land use decisions.** *Water Sustainability Act* water objectives are generally site-specific numerical standards for water quality, quantity, and aquatic ecosystems. They are tools to measure whether goals related to aquatic ecosystem health are being achieved. Water objectives set out criteria (and a means to evaluate progress towards those criteria) for water quality and quantity that land and resource use decision-makers must consider when making a decision.

***Water Sustainability Act* water objectives are not:**

- **Overarching aspirations.** Although a common interpretation of "objective" is an overarching goal—the accepted meaning in public administration—*Water Sustainability Act* water objectives are not generally viewed as these kinds of high-level aspirations.
- **The same as water quality objectives found under the *Forest and Range Practices Act*.** *Water Sustainability Act* water objectives are distinct from the "water quality objectives" that can be established under the *Forest and Range Practices Act* for designated community watersheds.[81]

xxiv WSA water objectives must be coordinated with other related government initiatives, including the work on cumulative effects and the Environmental Mitigation Policy.

LESSONS FROM EXISTING OBJECTIVES PROGRAMS IN BRITISH COLUMBIA AND BEYOND[xxvi]

British Columbia's Forestry Objectives

In British Columbia, the *Forest and Range Practices Act* (FRPA) regulates forest and range practices on Crown land.[83] The *FRPA* gives the Province the power to set objectives for specific features and resources such as soils and wildlife.[xxvii] These objectives are broadly defined as "desired outcomes of forest and range practices." Forest tenure holders are required to create forest stewardship plans, which require government approval.[84] Tenure holders rely on the advice of professionals to demonstrate that their logging activities are consistent with the objectives the Province has put in place.[85]

THREE CONCERNS ABOUT B.C'S FORESTRY OBJECTIVES:

1. The provincial government has failed to set objectives for some features and resources, such as forage and associated plant communities and recreation resources;[86] or objectives are too general and vague to be meaningful or legally useful.[xxviii]
2. Objectives are limited by the fact that they may only be implemented to the extent that they do not "unduly reduce the supply of timber from British Columbia's forests."[87]
3. The objectives are not sufficiently monitored to gauge whether or not decision-makers are actually meeting them.[88]

KEY LESSON: Establishing objectives is not enough. To be effective, objectives must be specific and carefully monitored.

Alberta's Water Conservation Objectives

Alberta's *Water Act*, enacted in 1999, introduced new water management planning provisions and water conservation objectives (WCOs).[89] Water Conservation Objectives are defined as "a certain amount and quality of water necessary to protect a natural water body or its aquatic environment; protect tourism, recreational, transportation, or waste assimilation uses of water; or manage fish and wildlife."[90]

FOUR CONCERNS ABOUT ALBERTA'S WATER CONSERVATION OBJECTIVES:

1. Consideration of water conservation objectives in licensing decisions is discretionary, not mandatory.[xxix]
2. Water conservation objectives are created only to fulfill recommendations set out in water management plans, of which there are few; therefore, the province of Alberta has set few WCOs.
3. When the Alberta Government enacted the *Water Act*, it also updated and strengthened the *Irrigation Districts Act (IDA)*. The *IDA* immunized Alberta Irrigation Districts, which are major water users, from the *Water Act* and water conservation objective holdbacks.
4. Some water conservation objectives are established at low ecological thresholds with little scientific justification.[xxx]

KEY LESSON: Water objectives must be legally enforceable and apply to all water users; it must be mandatory for all decision-makers to consider the objectives.

The United States' *Clean Water Act* Objectives

The *U.S. Clean Water Act* (CWA) establishes water objectives known as water quality standards (WQSs).[91] The WQS program reduces direct discharge of pollutants into waterways, requiring all states, territories, and authorized tribes to adopt Environmental Protection Agency-approved WQS for all navigable waters within their jurisdiction.[92]

Water quality standards have three components:[93]

1. Designated uses must be determined for a water body. Designated uses encompass existing uses of that water body as well as desired or aspirational uses. Among other uses these include: drinking water supply, fishing, and cultural or spiritual uses.
2. Mandatory water quality criteria are numeric or narrative descriptions of conditions necessary to support designated uses.[xxxi] Each designated use will have several water quality criteria dealing with different types of conditions and levels of specific chemicals.[xxxii]
3. Each state must monitor water bodies to determine whether water quality standards are being met, and must submit monitoring reports every two years.[94] If the standards are not met, state governments must place the water body on an impaired waters list, determine the pollution load reduction to meet the standards, and modify pollution permits.[95]

TWO CONCERNS ABOUT WATER QUALITY STANDARDS:

1. Most states initially developed narrative rather than numeric water quality standards for nutrients[96] and these narrative criteria can be too vague to be effective.[97]
2. States have the ability to exclude water bodies from their impaired waters list because of "naturally occurring conditions," which avoids addressing water quality issues.[98]

KEY LESSON: Requiring states, territories, and authorized tribes to adopt water quality standards for all navigable waters within their jurisdiction is generally deemed an effective approach that has improved water quality. However, vague narrative standards are not sufficient.

The European Union's Water Framework Directive Objectives

In 2000 the European Commission adopted the Water Framework Directive (WFD) with the goal of creating a European framework for water protection.[99] Article 4 of the Directive sets the following five objectives:[100]

1. No deterioration of surface and groundwater status, and the protection, enhancement, and restoration of all water bodies;
2. For water to achieve "good status" by 2015;[xxxiii]
3. For surface waters, a progressive reduction in pollution from priority substances and a phase-out of priority hazardous substances; for groundwater, prevention and limitation of new pollutants;
4. A reversal of significant, upward trends of pollutants in groundwater; and
5. The achievement of standards and objectives set for protected areas in community legislation.

As part of required river basin management plans, member states must design and implement measures to achieve the Directive's environmental objectives by 2015.[101] While member states must ensure they meet the Directive's objectives for each river basin, it is up to them to develop the necessary criteria and classification schemes to do so.

TWO CONCERNS ABOUT THE EU'S WATER FRAMEWORK DIRECTIVE OBJECTIVES

1. There are a number of exemptions that allow member states to set less stringent objectives and to extend deadlines beyond 2015,[102] with the result that member states have been slow or have failed to adopt river basin management plans and are relying heavily on exemptions to postpone the achievement of *good* status.[103]
2. Some river basin management plans do not adequately address the many dimensions of environmental flow needs (e.g. hydrology, water quality, geomorphology, biology, and connectivity); although the concept is sound, implementation has been limited.[104]

KEY LESSON: Allowing exemptions to the requirement to create water objectives creates loopholes resulting in delayed implementation of plans and programs to meet specified objectives.

xxvi While the *WSA* water objectives are distinct from the four objectives programs described here, these examples provide relevant insights to inform the Province's approach to developing water objectives.

xxvii The full list is: soils, visual quality, timber, forage, and associated plant communities, water, fish, wildlife, biodiversity, recreation resources, resource features, and cultural heritage resources. See *Forest and Range Practices Act*, SBC 2002, c 69, s 149.

xxviii For example, the B.C. Auditor General's 2012 report found that the timber objectives were vague and poorly defined, and recommended that the Province develop clearly defined timber objectives and stewardship principles to guide decision-making, actions, time frames, and assessment of results. See: Office of the Auditor General of British Columbia, An Audit of the Ministry of Forests, Lands, and Natural Resource Operations' Management of Timber, online: <http://www.bcauditor.com/> at 15.

xxix *Water Act*, RSA 2000, c W-3 s 51, 53, s 60(3)(c), 82(5)(b)(i). One of the most powerful aspects of WCOs is *Water Act* decision-makers' power to hold back 10 per cent allocated water when licences are transferred, at which point the government can apply for a special WCO licence to protect this water. See *Water Act*, RSA 2000, c W-3 s 51(2), 83(1).

- The Province can create water objectives in separate regulations (s. 43(1)).
- The Province can establish water objectives for specific watersheds, streams, aquifers, or an "other specified area or environmental feature or matter" for one of three purposes:
    1) To sustain water quality needed for specified water uses;
    2) To sustain water quantity needed for specified water uses; and
    3) To sustain water quality and water quantity needed to support healthy and functioning aquatic ecosystems (s. 43(1)(a)).
- The regulations that create water objectives can specify:
    1) Which decision-makers must consider objectives;
    2) What factors and criteria a decision-maker must apply to evaluate the impact of proposed land or resource uses on an objective; and
    3) What a decision-maker must do to address the impact of a proposal on an objective (s. 43(1)(b)(c),(2)(a)(b)).
- The regulations that create water objectives can require regional districts, municipalities, local trust committees, and other prescribed persons or entities to consider water objectives in their planning processes (s. 43(5)).
- Cabinet specifies how water objectives relate to other environmental objectives, standards, requirements, or plans established under the *Water Sustainability Act* or other legislation (s. 43(4)).

Learning from Other Places and Sectors

It is difficult to get objectives right. This is clear from British Columbia's experience with forestry objectives, and Alberta's struggle with water conservation objectives. The United States and the European Union, both of which incorporate different types of water objectives in their governance regimes, also offer lessons on practices to adopt, and practices to avoid (see box: *Lessons from Existing Objectives Programs in British Columbia and Beyond* on page 30). The main takeaway messages for British Columbia from these four existing objectives programs are:

- A government must first establish objectives.
- Objectives must apply to all relevant decision-makers.
- Objectives must be specific and quantitative. Qualitative, narrative objectives do not work well because they do not provide a standard against which performance—by decision-makers and licensees—can be measured.
- The specific criteria and thresholds that indicate whether an objective's purpose is being met must be established using scientific methods.
- A government must not embed exceptions or exemptions into the regulation that permit decision-makers to delay or avoid considering objectives.
- An independent body must verify and monitor objectives to ensure they are achieving their purpose.

The B.C. Ministry of Environment has existing objectives programs, including water quality guidelines and water quality objectives. Province-wide water quality guidelines establish safe limits or parameters for such things as heavy metal concentration or turbidity, to protect water uses.

Water quality objectives apply on a site-specific basis to protect the most sensitive designated water uses at that site.[82] However, these guidelines and objectives are not legally binding or directly enforceable.[xxv] While the existing water quality guidelines and objectives may inform the processes through which provincial staff develop water objectives, *WSA* water objectives are distinct from the existing approach in two ways. First, *WSA* water objectives relate not only to water quality, but also extend to water quantity and ecosystem health. Second, *WSA* objectives can be made legally enforceable. A broad spectrum of land and resource use decision-makers, in addition to regional districts, municipalities, local trust committees, and other entities, can be required to consider *WSA* water objectives in their decisions and planning processes.

xxx See Alberta Environment and Parks, *Water Conservation Objectives*, online: <http://www.esrd.alberta.ca> for a list of objectives set for the sub-basins. For example, following completion of the South Saskatchewan River Basin water management plan, government set many of the WCOs for river sub-basins at only 45 per cent of natural flow—viewed by many as a scientifically indefensible threshold.

xxxi These could include criteria for pollutant concentrations, temperature, pH, turbidity, and/or toxicity, or they could take the form of a narrative statement such as "no substances in amounts toxic to humans or aquatic life." See EPA, Introduction to the Clean Water Act, online: Watershed Academy Web <http://www.epa.gov/watertrain> at 7.

xxxii States can consider economic factors when setting the designated use for a water body, but they must take only scientific considerations into account—and cannot factor in economics—when developing the water quality criteria for a specific designated use. See EPA, Introduction to the Clean Water Act, online: Watershed Academy Web <http://www.epa.gov/watertrain> at 10&12.

xxxiii For surface water this means good ecological and chemical status; for groundwater this means good chemical and qualitative status.

xxv Although not enforceable, water quality objectives can and are used to inform decisions that are legally enforceable, including by government agencies to inform authorizations and permits; in watershed management planning processes; by local government to inform official community plans and regional growth strategies; or by drinking water suppliers to develop source water protection plans and collaborative approaches to stewardship.

CHECKLIST FOR SUCCESSFUL REGULATIONS ON WATER OBJECTIVES

The *Water Sustainability Act* objectives have the potential to ensure that decision-makers consider water when making approval decisions related to land and resource use. This in turn will help address cumulative effects on water resources from land and resource development activities. To be effective, objectives must be:

1. Specific and measurable;
2. Required for consideration by all relevant decision-makers, and legally enforceable; and
3. Linked to ecological function and ecosystem health within specific ecosystems.

The following is a recommended two-step process for setting and implementing water objectives:

Step 1: Develop Strong and Meaningful Water Objectives

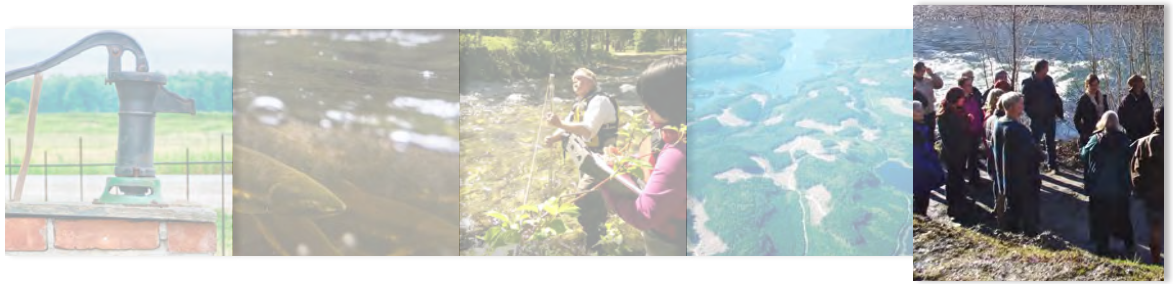
- ✓ Identify the watersheds, streams, aquifers, or other specified environmental features that require protection to sustain water quality or quantity for: a) aquatic ecosystems, or b) specified water uses (such as drinking water, fishing or recreation).
- ✓ Identify water quality or quantity parameters required to sustain aquatic ecosystems or specified water uses; pair these with specific, quantitative *acceptable condition thresholds*, and establish the current status of the water in relation to these thresholds.[xxxiv]
- ✓ Determine the appropriate, and ecologically meaningful, scale for a given objective.[xxxv]

Step 2: Apply Water Objectives

1. Require all relevant decision-makers in a watershed to consider water objectives.
   - ✓ Require decision-makers to model how a given decision will affect *acceptable condition thresholds*; use this information when deciding whether to grant an approval (or permit, tenure, licence, etc.) or to impose permit conditions and mitigation measures.
2. Conduct regular reviews of water objectives.
   - ✓ Review and amend water objectives every three to five years to ensure they continue to provide appropriate evaluative criteria and thresholds based on current science.
   - ✓ Designate an independent third-party entity to periodically evaluate whether objectives are being met, conduct audits, investigate public complaints about compliance with water objectives, and issue special reports.
3. Ensure water objectives are applied consistently.
   - ✓ Require water sustainability plans and area-based regulations to be consistent with established water objectives if these plans or regulations do not explicitly establish water objectives.

xxxiv For example, an acceptable condition threshold for water quality could be a specific allowable concentration of a given heavy metal.

xxxv For example, if it is a temperature objective, the scale might need to be a specified reach of river, while if it is an objective related to the concentration of a given pollutant, the scale might be at the watershed level. The stream order system is one way to consistently classify different ecological scales with which to measure objectives (see: U.S. Environmental Protection Agency, "Water: Monitoring & Assessment," online: U.S. Environmental Protection Agency <http://water.epa.gov/type/rsl/monitoring/vms21.cfm>).



KEYS TO SUCCESS: **PLANNING AND GOVERNANCE**
Preparing British Columbia for a Sustainable Future

DISCUSSION SUMMARY

1. The many types of water plans that already exist in British Columbia are generally useful, but most are not legislated and are therefore difficult to enforce.
2. British Columbia has had some success with enforceable plans, such as BC Hydro water use plans, but also some challenges due to lack of implementation of legislated planning processes, such as drinking water source protection plans and water management plans.
3. Water and watershed planning is vitally important for long-term water stewardship and conflict resolution, and British Columbia must commit to developing and implementing enforceable water sustainability plans in key areas.
4. Successful plan development, implementation, and enforcement are inherently tied to governance.

The Need for Water Planning and New Approaches to Governance in British Columbia

A quick scan of the province reveals that fresh water is under increasing pressure in many regions across British Columbia (see Appendix B: *British Columbia's Emerging Water Issues*). In the Cowichan, Okanagan and Fraser Valleys, the Gulf Islands, and northeastern British Columbia, a host of different water use conflicts and declining ecological conditions are challenging current water law. These conflicts are not simple disputes between individual licence holders; they

involve complex watershed systems where factors such as declining precipitation, increasing impermeability, climate change, and aquifer drawdown all change how the system functions. British Columbia needs long-term water planning to address these myriad and cascading effects, and their ecological, social, and economic impacts.

In response to large-scale water use conflicts around the world, other jurisdictions have consistently turned to basin-wide plans and agreements to address the particular issues at hand (see box: P*lanning for Water Sustainability in the U.S. and Australia* on page 38). Enforceable watershed-based plans in British Columbia can provide a framework for preventing and mediating conflicts, protecting ecosystems, and responding to future water uncertainties. Past successes such as with BC Hydro's water use plans illustrate the powerful potential of good planning that is well resourced to create meaningful change (see box: *British Columbia's Cutting Edge Water Use Plans* on page 36). Communities require a structured process to develop a vision for how to keep their ecology and economy functioning in times of shortage and changing priorities. Plans allow for watershed-specific solutions and structures that can liberate water for essential uses, and they include options to deal with future challenges.

Plan development, implementation, and enforcement

BRITISH COLUMBIA'S CUTTING EDGE WATER USE PLANS

Throughout the 1990s, the Bridge River hydroelectric development in the Lillooet District was the site of high-profile incidents of fish mortality and habitat destruction resulting from the facility's flow management decisions.[xxxvi] The River became a focal point of tension and litigation between BC Hydro and the Department of Fisheries and Oceans until they agreed to initiate a water use plan for the Bridge River system in 1998. After extensive trial flow releases, stakeholder and advisory meetings, and a settlement agreement with the St'át'imc First Nation, the Bridge River water use plan came into effect in 2011. The implemented plan already shows much promise and clear evidence of river restoration.[105]

BC Hydro developed 23 water use plans throughout much of southern British Columbia using collaborative processes involving licensees, government agencies, First Nations, key partners, and the public. The majority of these plans have achieved consensus approval,[106] and describe operating rules for each hydroelectric facility that address the particular interests at stake.[107] Although driven by escalating conflicts over hydroelectric water use in the late 1990s, the plans represent a major leap forward for water-based planning in the province. These plans are even recognized as international leading practices in water planning.[xxxvii] Key factors in their success included a commitment to adaptive management strategies based on the most current information, and a structured decision-making approach, which built trust and a shared understanding of trade-offs.

xxxvi The Bridge River development consists of three impoundment dams, three reservoirs, and four generating stations, generating 6-8 per cent of B.C.'s electricity.

xxxvii Key drivers of the water use plan process included changing environmental requirements for hydroelectric facilities internationally; environmental audits and reports showing mounting evidence of BC Hydro's frequent licence violations; and a NGO petition to the Commission for Environmental Cooperation protesting the way BC Hydro's dams had impacted fish and water. See Jim Mattison et al., Water for Power, Water for Nature: The Story of BC Hydro's Water Use Planning Program, (Vancouver, B.C.: WWF Canada, 2014), online: <http://awsassets.wwf.ca/downloads/wup_report_r04.pdf> at 9-15.

are inherently tied to governance, which includes both the processes of decision-making and provisions for holding decision-makers accountable. No matter how outstanding a plan, it will not result in action unless there is an effective governance framework in place to support it. British Columbia's forest stewardship plans clearly demonstrate the consequences of failing to link planning to actual decisions (governance).[xxxviii] A recent Forest Practices Board assessment of forest stewardship plans found that, among other shortcomings, the plan documents often lacked clarity due to complex language and poor correlation to operations on the ground. Many of the results, strategies, and measures in forest stewardship plans are not measurable or verifiable and therefore not enforceable.[108]

A strong governance framework clarifies roles and responsibilities, creates accountability for plan implementation, and ensures goals are achieved. The partnership approach will be key to the success of water planning in British Columbia. The Province does not necessarily have the capacity to develop and implement

BRITISH COLUMBIA'S CURRENT WATER PLANNING FRAMEWORK

British Columbia has had mixed success with its existing water planning processes. Governments and other stakeholders have created a patchwork of water-based plans across British Columbia, few of which are enforceable. The plans fall into five general categories:

1) **Community-based plans** – Generally ad-hoc, with varying degrees of senior and local government involvement. These plans have no set structure and are non-binding (e.g. Cowichan Basin Water Management Plan[110] and the Nicola Water Use Management Plan[111]).
2) **Legislated plans** – Specific in nature, authorized in legislation, and with well defined scope and jurisdiction (e.g. drinking water protection plans[112] and water management plans[113]).
3) **Local government guidance/technical plans** – Technical in nature and dealing generally with areas of responsibility associated with local government or local issues (e.g. liquid waste management plans,[114] water conservation plans,[115] and drought plans[116]).
4) **First Nations-led plans** – First Nations and First Nations leadership organizations are developing water strategies to guide water management and stewardship within their traditional territories and at a provincial level (e.g. Our Syilx Water[117] and the First Nations Fisheries Council's Water for Fish strategy[118]).
5) **BC Hydro water use plans** – BC Hydro developed water use plans to find a better balance between competing water uses for hydroelectric facilities and other users and resulted in changes to facility operations and water flow requirements (see box: *British Columbia's Cutting Edge Water Use Plans* on page 36).

xxxviii Water planning processes are not directly comparable to forest stewardship plans, as forest stewardship plans are proponent-prepared plans dealing principally with forestry operations. However, the critical point is that an effective governance regime is ultimately needed to have positive impacts on the ground.

watershed-based plans on its own; involving those most directly affected by water decision-making—First Nations, licence holders, and watershed and stewardship groups—will create a more transparent and responsive water management regime.[109]

New Planning and Governance Potential in the *Water Sustainability Act*

The current water planning framework for British Columbia is characterized by fragmentation and ad hoc planning processes (see box: *British Columbia's Current Planning*

PLANNING FOR WATER SUSTAINABILITY IN THE UNITED STATES AND AUSTRALIA

Murray Darling Basin Plan

The Murray Darling Basin Plan (MDBP) emerged out of water law reform process spurred by the Millennium Drought in Australia in the 2000s.[120] The purpose of the MDBP is to address overextraction from the Basin's rivers, with the aim of achieving a balance between environmental, economic and social considerations. It limits water use to environmentally sustainable levels by determining long-term average sustainable diversion limits for both surface water and groundwater resources.[121] National and state governments are implementing the MDBP over a seven-year period, which includes:

- An environmental watering plan to optimize environmental outcomes for the Basin;
- A water quality and salinity management plan;
- A mechanism to manage critical human water needs; and
- Requirements to monitor and evaluate plan implementation.

Plans under the Washington State Water Management Act

Washington State has a statewide watershed planning program enabled through the 1998 *Watershed Management Act*.[122] The Act provides a framework for locally based watershed planning and resource management based on Watershed Resource Inventory Areas (WRIA). Plans must address future water supply and water use, water quality and habitat issues, and recommend instream flows for streams and rivers in each WRIA. The primary goals of Washington's watershed plans are to:

1) Assess the status of water resources within Washington's 62 Watershed Resource Inventory Areas.
2) Determine how to address competing demands for water within each WRIA.

➤

Framework on page 37).[119] The *Water Sustainability Act* has strong potential to revitalize British Columbia's water planning landscape by enabling a consistent watershed-based approach to planning through water sustainability plans.

The *Water Sustainability Act* includes a comprehensive planning regime, the cornerstone of which is provision for water sustainability plans (see Appendix C for a detailed decision-based flow chart that explains the authority and implementation options for water sustainability plans under the Act). The *Water Sustainability Act* allows the

The Elwha Dungeness Plan, approved in 2005, was one of the first plans. It was driven primarily by concerns about water quantity and balancing different water uses. The approved watershed plan includes instream flow recommendations for the Dungeness River and Elwha River and lower tributaries. The plan also makes recommendations on water quantity, water quality, habitat, stormwater, low impact development, water conservation, land use and management, and education and outreach.[123]

Klamath Basin Adaptive Management Plan

The Klamath River Basin has long been a site of conflict between farmers, Native American tribes, the fishing industry, power producers, and governments over water rights and availability. The region gained national attention during a drought in 2001 when enforcement of the Endangered Species Act triggered a shutdown of irrigation water to more than 1,300 farms and ranches.[124] After the 2001 crisis, the Klamath Basin Conservation Districts developed a list of mutual resource goals and objectives for the Basin. The primary goal is to achieve a reliable water supply for agriculture, with four core objectives:

1) Decrease water demand;
2) Increase water storage;
3) Improve water quality; and
4) Develop fish and wildlife habitat.

The Klamath Basin Adaptive Management Plan involves three phases:[125]

1) Rapid assessment on a sub-basin scale of current resource conditions, recommendations of management systems to solve identified problems, and estimates of on-farm effects.
2) Evaluation of the cumulative effects of proposed resource management systems on a basin-wide scale.
3) Planning, designing, and implementing projects at the sub-basin or community level, including monitoring and evaluating the effectiveness of conservation measures.

Province to order a planning process for an area or proposed development if the plan will assist in:

- Preventing or addressing conflicts between water users;
- Preventing or addressing conflicts between water users and environmental flow needs;
- Preventing or addressing risks to water quality or to aquatic ecosystem health; or
- Identifying restoration measures in relation to a damaged ecosystem (s. 65).

Once the Minister has ordered a water sustainability plan for a specific area, responsibility for the plan development may be designated to an appropriate and legitimate planning entity or person. In most places this will likely be an entity that includes representation from the Province, First Nations, local government, and local water purveyors, among other key stakeholders and rights holders. The water sustainability plan development process can include a variety of forms of data collection (ss. 71-72), and must involve consultation with licensees who may be detrimentally impacted by the plan. A proposed water sustainability plan must include information about the issues to be considered and proposed solutions, a summary of concerns from potentially-affected rights holders, and an outline of estimated implementation and compensation costs and responsibilities (s. 73).

Cabinet may give legal teeth to plans by bringing them into force through regulations that can address a wide range of issues (s. 75), granting authority to:

- Amend licence terms and conditions, regardless of the priority of those licences (i.e. water sustainability plans can require existing licensees to reduce water diversions under certain circumstances (ss. 79-80));
- Establish the precedence of the water sustainability plans over other plans (s. 81); and
- Protect groundwater, through restricting or imposing requirements on certain activities such as constructing a well (s. 83).

By bringing water sustainability plans into force through regulation, they can in effect become binding plans that develop innovative, tailor-made solutions to specific regional issues. However, to be successful it is critical not only to develop such plans but also to implement them on the ground. Attention to governance provides this important link to translate plans from paper into action on the ground (and in the water).

A Partnership Approach to Governance: The Link from Plan to Action

As emphasized throughout this report, water stewardship in British Columbia will depend on new partnerships and relationships between key players in particular watersheds. Regional water sustainability planning processes are a key arena in which the Province must engage closely with First Nations, licence holders, local governments, and watershed and stewardship groups, amongst others. Doing so will not only ensure the water sustainability plans are transparent and respond to specific regional challenges, but will also enable local knowledge, expertise, and capacity to support plan development and, ultimately, implementation.[xxxix]

Once a water sustainability plan is developed, it will only be effective to the extent that it is implemented and

xxxix For an in-depth discussion of watershed governance in B.C., see: Oliver Brandes & Jon O'Riordan, A Blueprint for Watershed Governance in British Columbia, (Victoria, B.C.: POLIS Water Sustainability Project, 2014), online: <http://www.poliswaterproject.org/blueprint>

enforced. The *Water Sustainability Act* may also facilitate a more substantial decision-making role for other entities in plan implementation and enforcement. Section 126 of the *Water Sustainability Act* introduces the authority to delegate statutory decision-making under the Act to other organizations or entities, including the power to issue licences and enforce the Act. Regulations need to clearly articulate the rules for how delegated decision-making through the *Water Sustainability Act* could work. Because these shared or delegated decision-making arrangements are part of a novel approach to water governance in British Columbia, it is critical to begin by pilot testing different local decision-making models. Whatever the form of delegated governance, water sustainability plans require a partnership approach to implementation. The Province cannot be the sole actor in this complex implementation process, which is largely based on relationships between governments, First Nations, communities, and other stakeholders.

As the Province develops and refines its approach to water sustainability planning, it can learn from other jurisdictions' water planning processes, which provide insights on plan content, development processes, and timelines (see box: *Planning for Water Sustainability in the United States and Australia* on page 38).

CHECKLIST FOR SUCCESSFUL PLANNING AND GOVERNANCE REGULATIONS

The *Water Sustainability Act* has the makings of a true watershed moment for water planning and governance in British Columbia. It provides the legal framework and enabling powers not only for a comprehensive approach to regional water sustainability planning, but also for new forms of delegated decision-making for water sustainability plan development and implementation. The following checklist includes key elements for effective water planning and governance in British Columbia:

1. **Develop and implement binding water sustainability plans in partnership with First Nations as leaders and in co-governance roles.**
   - ✓ Identify watersheds requiring water sustainability plans in the short (three years), medium (five to seven years) and long (10 years) terms.
   - ✓ Develop three water sustainability plans within the first five years of the *Water Sustainability Act* coming into force and make them enforceable through regulation. Treat these as learning opportunities to inform all future plans and processes.
   - ✓ Partner with First Nations to develop planning processes.
   - ✓ Delineate clear lines of accountability for plan implementation and enforcement.
2. **Commit adequate resources to develop and implement water sustainability plans.**
   - ✓ Implement a regular, periodic review of the pricing regime (starting in summer 2016 and at least every five years thereafter) to ensure the Province is obtaining sufficient revenue from water use to fully fund water sustainability plan development and implementation.
3. **Start the water sustainability plan process early and develop clear timelines and targets.**
   - ✓ Begin developing water sustainability plans now with concrete timelines for implementation and start learning by doing ("start simply and simply start").[xl]
4. **Embed into regulations accountability criteria for those designated to develop water sustainability plans and the governance entities tasked with decision-making authority.**
   - ✓ Specify which entities can obtain the authority to develop and implement water sustainability plans; how they can do so; what the composition of the entities must be (i.e. at minimum, representation from the Province, First Nations, and local government); and where they will get the funds to ensure they can effectively implement the plans.
5. **Pilot test shared decision-making governance models.**
   - ✓ Develop three to five watershed governance pilot projects in key watersheds to test different models of shared or delegated decision-making.

xl B.C. can learn from, and improve upon, the timeline for planning and governance of California's *Sustainable Groundwater Management Act*; almost 50 years will have passed between the creation of the first framework for local groundwater planning in the state (1991) and when groundwater management plans must be implemented and achieve sustainability criteria (~2040). See Randy Christensen and Oliver Brandes, California's Oranges and *B.C.'s Apples: Lessons for B.C from California's Groundwater Reform*. (Victoria, B.C.: POLIS Water Sustainability Project, 2015), online: <http://poliswaterproject.org/orangesapples>

3. Next Steps: Water Reform as Part of a Bigger Picture

3.1 Tributaries Flowing into a Much Larger River

Fully implementing the *Water Sustainability Act* is an important step towards improving water stewardship and water governance in British Columbia. However, in the broader context it represents only one of many tributaries flowing into a much larger river as the province begins the long and challenging course ahead. British Columbia must ultimately surpass the initial protections offered under the *Water Sustainability Act* to ensure that fresh water is sustainably managed and shared equitably now and into the future.

Examples from other jurisdictions present a range of possibilities and lessons for British Columbia as the province continues to navigate to a sustainable future of water law:

- In New Zealand, the Whanganui River Settlement Agreement resolved a 175-year-old conflict over New Zealand's longest navigable river. It granted the Whanganui River "legal personhood" and created a joint River guardian position representing the Crown and the Maori Whanganui iwi tribe.[126] This kind of innovative collaborative governance and shared decision-making arrangements represent the cutting edge of governance structures involving First Nations in stewardship and governance of fresh water in its ecological context.
- In the United States, the Winters Doctrine establishes that when the United States created tribal reservations—the equivalent of Indian reserves in Canada—the government also granted a reserved right to the water necessary to sustain the tribal population and fulfill the purpose for which the reservation was created.[xli] This approach offers a valuable example of how governments and communities can acknowledge and protect Aboriginal water rights.
- Numerous jurisdictions around the world, including in Canada, have embraced and applied the public trust doctrine, a legal doctrine that recognizes that government does not own water but only holds it in trust for its citizens and future generations. The public trust doctrine emphasizes that government has a fiduciary duty to protect and sustain common resources such as air, oceans, and fresh water for the use and enjoyment of all, both now and in the future.[xlii] Codifying

xli The Winters Doctrine was established through the *Winters v United States*, 207 U.S. 564 (1908) ("Winters") case. For details see Micha Menczer, Kathryn Deo & Sarah Malan, "Report for B.C. Assembly of First Nations: Legal Analysis of the Legislative Proposal: *Water Sustainability Act*" (13 November 2013) in B.C. Assembly of First Nations, "Water Sustainability Act Legislative Proposal" (2 December 2013), online: Public Submissions – First Nations (Stage 3) <http://engage.gov.bc.ca> at 13-14; Merrell-Ann S Phare, *Denying the Source: The Crisis of First Nations Water Rights* (Surrey, B.C.: Rocky Mountain Books, 2009) at 57-60.

the public trust doctrine in law in British Columbia would represent a significant shift from a legal ethic of exploitation to an ethic of conservation, and empower citizens to play a meaningful role as protectors of British Columbia's environment.

Clearly, modernizing the rules that govern water is a long-term project that will continue to evolve—and challenge us all—into the future.

3.2 In Summary: From Lessons to Action in British Columbia

In British Columbia, the quality and quantity of water is vital to communities, quality of life, ecosystem health, the ability to grow food, and to support economic development. British Columbians have clearly demonstrated that protecting fresh water is a priority. Recent public opinion research found that 93 per cent of British Columbians agree that fresh water is "our most precious resource."[127] Yet, escalating water issues across the province make it clear that, currently, British Columbians are inadequately equipped to effectively protect water resources.

The recently enacted *Water Sustainability Act* represents a rare opportunity to significantly modernize British Columbia's water law regime to protect and preserve water resources in the province. Many individuals, First Nations, stewardship, professional and community organizations, local governments, and industry sectors provided critical input to the Province throughout the *Water Act* modernization process, which assisted government in creating a robust legislative framework.[128] However, the might of the *Water Sustainability Act* will ultimately depend on the strength of its regulations.

Inherent in the recommendations set out in the "checklists for successful regulations" throughout this report are three prerequisites to the *Water Sustainability Act* reaching its full potential:

1) Making a fundamental shift towards a new partnership of shared risk and responsibility;
2) Engaging key stakeholders, rights holders, and the public in a transparent ongoing process while regulations are developed; and
3) Ensuring sufficient funding and resources for implementing the *Water Sustainability Act*.

The Province cannot successfully manage water by itself. Effective and sustainable water management depends on a shift towards a partnership of shared risk and responsibility that involves all of those most directly involved in water use and stewardship: the Province; First Nations; federal and local governments; water licence holders; and community, watershed, and stewardship organizations.

This partnership approach starts by ensuring all the key stakeholders and licensees play a role in the development of the critical regulations that will make the *Water Sustainability Act* work. Maintaining the commitment to open and transparent engagement through the regulation development process will assist in creating strong and lasting regulations. These regulations must set in motion new relationships among all the partners. First Nations will be actively involved in all aspects of planning and decision-

xlii Two common features of the public trust are a duty to provide the public with adequate, timely information that allows them to judge whether the Crown is meeting its trust obligations, and a "right of standing" to litigate any failure of the Crown to meet its public trust obligations. See Oliver M. Brandes & Randy Christensen, *The Public Trust and a Modern B.C. Water Act* (Victoria, B.C.: POLIS Water Sustainability Project, 2010), online: POLIS Water Sustainability Project <http://www.poliswaterproject.org> at 1-2; Sarah Jackson, Oliver M. Brandes & Randy Christensen, "Lessons from an Ancient Concept: How the Public Trust Doctrine will meet obligations to protect the environment and the public interest in Canadian water management and governance in the 21st century" 23 Journal of Environmental Law and Practice 2 175 at 153-161.; Ralph Pentland, "Destined to Fail? Groundwater Management in Canada" (Paper delivered at the Munk School of Global Affairs at the University of Toronto Security Underground Symposium, 28 May 2015) at 16-17.

making; licence holders will receive the benefits of access to water and will also have management responsibilities; and community, watershed, and stewardship organizations will contribute local expertise and knowledge for water stewardship.

Finally, all of the legislation and regulations in the world will have little impact without sufficient resources for implementation. Adequate resources for on-the-ground action are essential to protecting and sustaining British Columbia's fresh water now and into the future.

Adopting the recommendations in this report will help the Province of British Columbia create a functional legal core that brings the promise of the *Water Sustainability Act* to life and equips British Columbia to address current water issues, preserve water resources and aquatic ecosystems, and lay the groundwork to prevent and resolve future water conflicts and crises. Getting the *Water Sustainability Act* right is the critical step for British Columbia to set a course towards a sustainable future for water.



APPENDIX A: THE *WATER SUSTAINABILITY ACT* IN A NUTSHELL

Promising features and strategies: The *Water Sustainability Act* introduces innovative features and strategies that could help the Province conserve and protect British Columbia's freshwater resources.

✓ **The Province will license and regulate groundwater for the first time**, starting with all non-domestic groundwater users. This will allow the Province to better manage fresh water as one integrated resource.

✓ **Water flows for ecosystems and fish will be better protected.** The *Water Sustainability Act* introduces several new legal mechanisms that could help protect and restore water flows for fish and ecosystems, also known as "environmental flows."

- Decision-makers are required to consider the environmental flow needs of a stream in all future licence decisions or licence reviews that relate to a given stream or to a hydraulically connected aquifer (s. 15).
- The Province may issue short-term interventions called "critical environmental flow protection orders" and "fish population protection orders" that prioritize the minimum flow needs of streams and aquifers when significant water shortages exist and fish and ecosystem values are threatened (s. 86-88).

✓ **There is a new power to set water objectives for the purpose of sustaining water quantity, quality, and aquatic ecosystems in British Columbia.**

- Cabinet may establish water objectives for specific watersheds, streams, aquifers, or other specified areas or environmental features or matters (s. 43).
- Objectives can be set to sustain water quality or quantity for specified uses of water, and water quality and quantity required to sustain aquatic ecosystems (s. 43).
- Land and resource-use decision-makers will be required to consider water objectives if they are making a decision that relates to the watershed, stream, or aquifer to which the objectives are attached (s. 43).

✓ **A new, comprehensive planning and governance regime is introduced that includes the possibility for water sustainability plans, area-based regulations, and delegated decision-making.**

- *Water sustainability plans* are permitted for areas where they can help prevent or address conflicts between water users, conflicts between water users and environmental flow needs, or risks to water quality or to aquatic ecosystem health. They can also be created in order to identify restoration measures in relation to a damaged aquatic ecosystem (s. 65). Such plans may create new ways to share water or a requirement that licensees reduce the amount of water they are diverting under their licence (s. 79).

- *Area-Based Regulations and Sensitive Stream Designations – The Water Sustainability Act* permits Cabinet or the Minister to make location-specific regulations that designate specific areas and create unique thresholds and requirements for those places (ss. 124(4)(c)-(d), 128-129). This allows for tailored solutions based on local priorities and needs.
- *Delegated Decision-Making – The Water Sustainability Act* introduces the potential for the Minister to delegate decisions specific to the Act to other organizations or entities, including decision-making power to issue licences and enforce the *Water Sustainability Act* (s. 126).

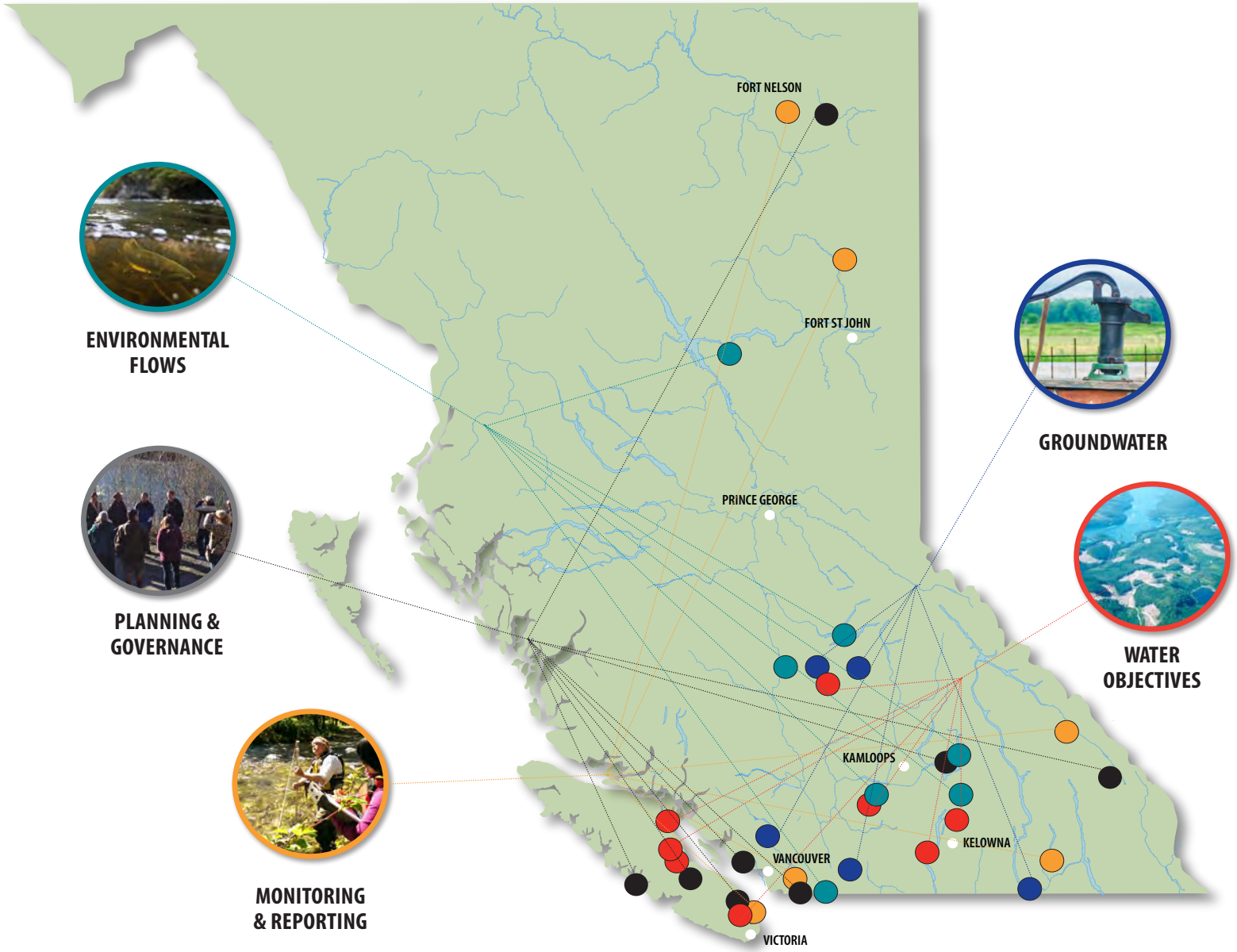
✓ **"Beneficial use" will be defined for the first time and includes a requirement that people use water efficiently.**

- Beneficial use is defined as "using water as efficiently as practicable, in accordance with any applicable regulations, and for the purpose, in the manner and during the period authorized in the licence" (s. 1).
- Introducing a new "efficiency" requirement and creating flexibility in the term as it can be further defined in regulations.

✓ **The Province's broad discretion to impose detailed monitoring and reporting requirements on water users will be preserved and expanded from the existing *Water Act*.**

- The *Water Sustainability Act* introduces new monitoring and reporting requirements. For instance, if a decision-maker determining the environmental flow needs of a stream requires information or assessments, the applicants are required to provide this information (s. 1, s. 15).
- Government has the power to create a regulation that requires water users to measure actual water use under a surface or groundwater licence and report their usage to government (s. 131).

APPENDIX B: BRITISH COLUMBIA'S EMERGING WATER ISSUES



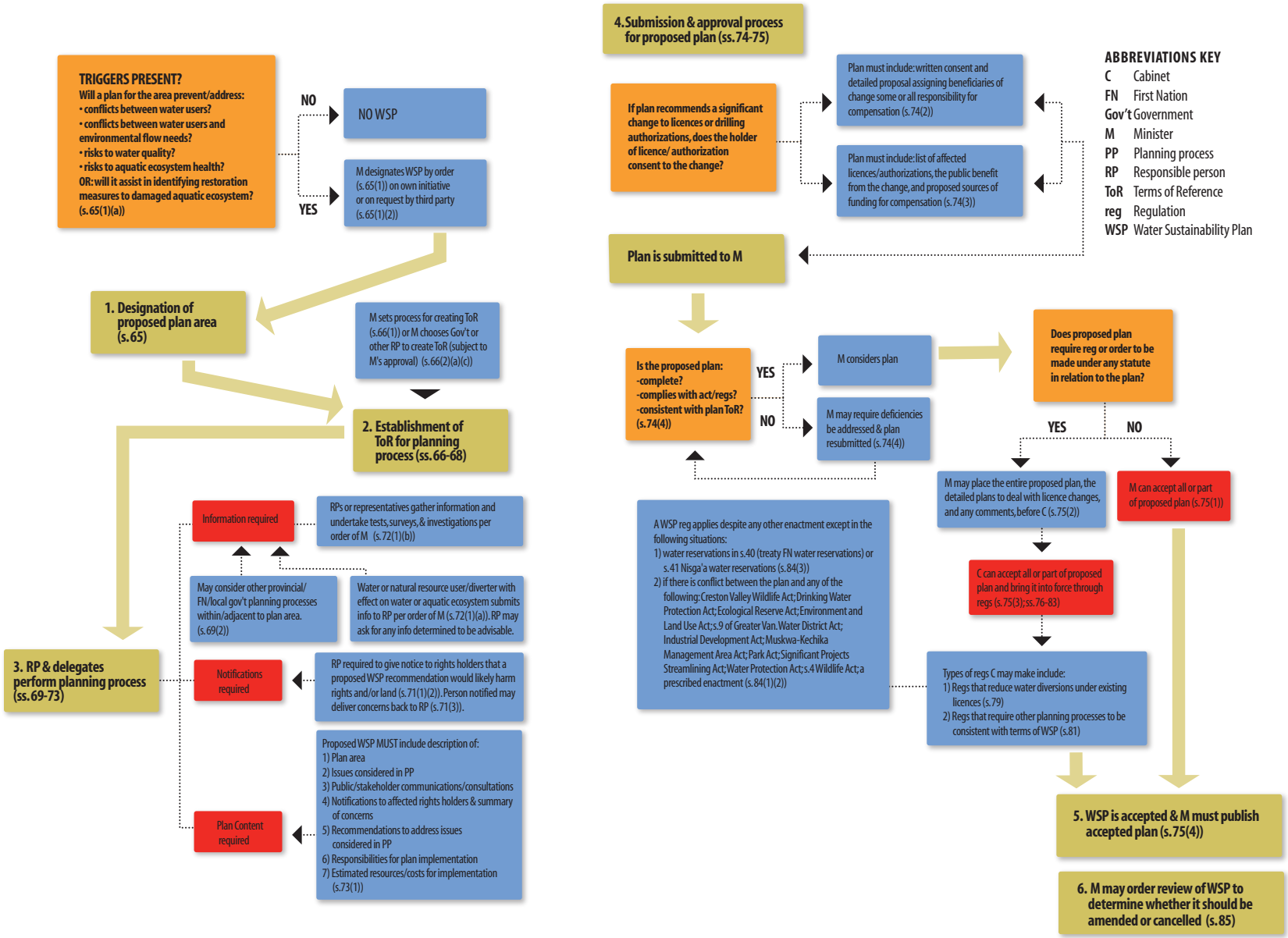
REGULATORY AREA	MEDIA STORY HEADLINE/ EAB CASE DESCRIPTION	PLACE & DATE	DETAILS OF ISSUE
GROUNDWATER	Paradise Valley Residents vow to fight water plan for proposed resort north of Squamish[1]	Paradise Valley 27/05/2015	A proposed ski resort development intends to draw more than 1 billion liters of groundwater per year from a Paradise Valley aquifer. Residents are concerned about the lack of information about the aquifer and possible environmental impacts.
	Aldergrove connects to Metro Vancouver's water supply to reduce pressure on declining aquifers[2]	Aldergrove 04/05/2015	The Township of Langley is connecting to Metro Vancouver's water system since local aquifers are being depleted and there are severe water restrictions in place.
	Well runs dry at Fulford Hall event[3]	Salt Spring Island 03/05/2015	During an event at Fulford Hall the well ran dry from several hundred people using the venue. Attendees drew water directly from Fulford Creek, a fully allocated, salmon bearing, sensitive stream.
	Property owners warned of possible contamination[4]	Williams Lake 19/02/2015	Imperial Oil and Shell Canada warn property owners that contamination from former plant sites may have migrated into groundwater below their properties and that groundwater must not be used as a drinking water source.
	'Wild West' of groundwater: Billion-dollar Nestlé extracting B.C.'s drinking water for free[5]	Hope 04/08/2013	Nestle currently extracts billions of litres of groundwater each year from a well near Hope for use in its water bottling plant. This groundwater extraction is unlicensed, unregulated, and free.
	Teck submits plan to federal agency to deal with tainted groundwater [6]	Trail 03/11/2012	Teck Resources submits a plan to clean up decades-old toxins that have seeped into groundwater from its smelter. Tainted groundwater currently runs under the Columbia River into an aquifer in Trail.
	Uncapped wells a water threat[7]	Langley 12/07/2009	Thousands of uncapped flowing artesian wells in the Langley Township pump millions of litres of groundwater to the surface each year. The Hopington aquifer has been declining as much as 30 cm/year since the 1970s.
ENVIRONMENTAL FLOWS	Competition for precious water in drought-stricken Nicola Valley	Nicola Valley 17/09/2015	The Nicola River watershed is experiencing extremely low water flows. This has put pressure on the agriculture sector, which accounts for about 75 per cent of total water demand in the region. Intensive ranching water use in turn depletes creek and river flows. The intensive land and water uses and low flows in the region threaten salmon populations.
	First Nations Tribal Council suspends Okanagan sockeye salmon fishery[8]	Okanagan 29/07/2015	The sockeye salmon run in the Okanagan was far lower than expected, which biologists linked to higher than normal mortality from drought conditions. The Okanagan Nation Alliance suspended the area's recreational and commercial sockeye salmon fishery.
	Low streamflow advisory – Vancouver Island [9]	Vancouver Island 22/05/2015	Extreme low snow packs, below normal precipitation and warmer than average temperatures led to seasonally-low to extreme-low flow conditions on Vancouver Island.
	Historic low levels forecast for Campbell River system[10]	Campbell River 14/05/2015	Due to the low snowpack, the Campbell River system experienced extremely low water inflows. The reservoir release is already lower than the preferred fish habitat target.

REGULATORY AREA	MEDIA STORY HEADLINE/ EAB CASE DESCRIPTION	PLACE & DATE	DETAILS OF ISSUE
ENVIRONMENTAL FLOWS	New water licences issued on fully-allocated reservoirs[11]	Beaver Lake 16/10/2013	Although Beaver Lake Reservoir was deemed fully allocated in 1931, the Province has issued 500 additional licences on it since then, including 14 in 2013.
	Cowichan River in danger of drying up[12]	Cowichan River 7/10/2012	Due to extreme low flows in the Cowichan River, spawning salmon were trucked up-river when sections of the river became too shallow for fish passage.
	BC Hydro dealing with low water levels in Comox Lake[13]	Comox Lake 28/09/2012	Due to low water inflows into Comox Lake Reservoir, BC Hydro set a conservation flow at levels lower than the minimum requirement for salmon spawning and migration. Fish had to be trucked upriver.
	Future of tiny fish caught up in web of politics[14]	Fraser Valley 09/10/2011	The Nooksack dace is found in only four streams in Canada in the Fraser Valley. Its habitat is dwindling from water quality degradation from intensive agricultural land use, and stream flow disruption from diking on the Fraser River.
	Water Act order issued for Chimney Lake[15]	Chimney Lake 16/05/2011	FLNRO implemented water licence restrictions due to low flow conditions. As there was not enough water to supply licensed demand, FITFIR came into effect. For a period of time, only the three oldest licences on Chimney Lake system and domestic users were able to access water.
	Peter and Joan Sanders v Assistant Regional Water Manager[16]	Bridge Creek 05/04/2011	The Environmental Appeal Board (EAB) ruled in favour of licence applicants whose application was denied on the basis that there was insufficient flow to support the licence and minimum flow needs for fisheries. The EAB found that the Assistant Regional Water Manager relied on a flawed report to determine the minimum flows required to support fisheries in the Creek.
	Water use reduction order to protect fish populations[17]	Nicola River 18/09/2009	Due to extreme low flow conditions, the Minister of Environment issued an order temporarily curtailing water use on the Nicola River (under Section 9 of the Fish Protection Act) to protect the salmon population.
MONITORING & REPORTING	Fresh water: British Columbia's new cash crop[18]	Northeastern B.C. 30/05/2015	Farmers and landowners in northeastern B.C. are selling water from dugout reservoirs on their land to fracking companies. The practice is occurring with little oversight or impact assessment.
	Proposed marijuana grow-op will overtax waters supply, Maple Ridge residents say[19]	Maple Ridge 22/05/2015	Maple Ridge residents are protesting a proposed marijuana grow-op on basis that it will overtax the local aquifer. Although an independent hydrology report stated that the facility would not impact neighbouring water use, concerns persist.
	Canadian fracking lacks credible groundwater monitoring: Expert[20]	Northeastern B.C. 4/05/2014	One of North America's leading groundwater experts warns that no Canadian jurisdiction has established sufficient monitoring to protect groundwater in areas of intense shale gas extraction.
	Helmer v Assistant Regional Water Manager[21]	Roy Steward Spring (Golden) 2012	The EAB denied an application for an additional water licence on a spring. Despite the fact that there was unrecorded water available, the EAB found that there was insufficient information available to grant the licence, including about the interconnectedness of surface and subsurface water sources.

REGULATORY AREA	MEDIA STORY HEADLINE/ EAB CASE DESCRIPTION	PLACE & DATE	DETAILS OF ISSUE
MONITORING & REPORTING	*Fulford Creek Holdings v Assistant Regional Water Manager*[22]	Salt Spring Island 2010	A series of water licence holders on the same property who were supposed to use their water for a non-consumptive purpose had been using water for a consumptive purpose on a fully allocated, salmon bearing, sensitive stream. It took years for the Ministry to respond.
	VC Richard Baravalle v Regional Water Manager[23]	Aylmer Creek (Nelson) 2004	The EAB accepted the fact that the government had relied on creek flow records dating from the 1920s-30s in making a decision to grant a conditional water licence.
WATER OBJECTIVES	Mount Polley mine gets restricted OK to reopen[24]	Mount Polley 09/07/2015	In August 2014 a tailings pond breach from the Mount Polley mine released 25 million cubic meters of contaminated water and mining waste into creeks and rivers in the Quesnel watershed. One year later, the Mount Polley mine is operating again with a conditional permit without a long-term water management plan in place.
	Third algal bloom reported in Shuswap[25]	Shuswap Lake 27/05/2015	Algal blooms appeared in Shuswap Lake in June 2015, 2010, and 2008. Studies show that there are nutrient spikes in the Shuswap River and connected Mara Lake, but the nutrient source is unknown.
	B.C. mine tailings ponds pose serious risk to water sources: Report[26]	Mt. Polley and other mine sites 3/05/2015	The B.C. First Nations Energy and Mining Council concluded that mining tailings facilities in Northern B.C. pose risks to the drinking water of 33 First Nations and 208 other communities if they fail.
	Chilcotin rancher settles dispute with Tolko Industries over logging impacts on water[27]	Chilcotin 24/04/2015	A cattle rancher claimed that salvage logging of beetle-killed forests dramatically disrupted the amount, timing, and course of the water flowing on his property, which led to increased spring flooding, streamside erosion, and lowering of the water table.
	A year without tapwater[28]	Spallum-cheen 12/04/2015	The Steele Springs Waterworks District has been under a "do not drink" advisory since March 2014 because nitrate levels in the water source exceeded the maximum allowed under the Canadian Drinking Water Guidelines.
	Water quality threatened at Cultus Lake, says research[29]	Cultus Lake 19/01/2015	New research is showing that water quality at Cultus Lake is suffering from the effects of nutrient loading. The excess nutrients are from sources like agricultural fertilizers and soil erosion.

REGULATORY AREA	MEDIA STORY HEADLINE/ EAB CASE DESCRIPTION	PLACE & DATE	DETAILS OF ISSUE
PLANNING & GOVERNANCE	Our water is secretly sucked away by shale gas industry[30]	Williston Reservoir 15/03/2011	Within the space of one year, the Province approved two water licences for Calgary-based energy companies to withdraw a cumulative total of 7.3 billion litres of water each year from the Williston Reservoir to use in their fracking operations.
	Water licence for northeast B.C. fracking operation cancelled[31]	Fort Nelson 08/09/2015	The Environmental Appeal Board ruled in favour of the Fort Nelson First Nation and cancelled a water licence issued to the oil and gas company Nexen for fracking, citing that: a) the licence had been granted based on faulty science, and b) the Province's conduct was inconsistent with the honour of the Crown.
	Port Alberni water fight has political implications[32]	Port Alberni 20/05/2015	There are growing concerns in Port Alberni about the water quality and quantity impacts of old growth logging in the watersheds that supply the town with its drinking water.
	Native Band in Northern B.C. pushes for water licensing reform[33]	Fort Nelson 12/11/2012	Fort Nelson First Nation is concerned about water licences issued to fracking companies and asks for a moratorium on new licences until baseline environmental studies are done.
	First Nations oppose water extraction licences[34]	Sechelt 18/07/2012	Sechelt Indian Band, Homalco, and Klahoose First Nations opposed water licence applications for a water bottling project, due to a lack of consultation and concerns about adverse environmental impacts.
	Halalt First Nation takes Chemainus groundwater case to Supreme Court[35]	Chemainus 2011	The Halalt First Nation went to the B.C. Supreme Court against District of North Cowichan's proposed project to pump groundwater from the Chemainus River aquifer. The Supreme Court ruled in favour of Halalt on basis of inadequate consultation. The Court also ruled that the Halalt had prima facie title to the land and the groundwater associated with it. However, the Court of Appeal reversed this decision, finding that the duty to consult and accommodate had been met. The project was modified to have a narrower scope.
	Need to stop houseboat greywater discharge[36]	Shuswap Lake 17/07/2010	Discharges from houseboats are one of the major sources of nutrient inputs into Shuswap Lake. Provincial laws that prohibit greywater discharge in lakes have not been enforced.
	Langley targets water with ambitious plan[37]	Langley 2009	In response to growing concerns about groundwater depletion and contamination, in 2007, the Province ordered a water management plan for the Township of Langley. The Township submitted its water management plan to the Province in 2009, but the Plan has yet to signed off on or implemented.
	Paradise parched[38]	Tofino 16/09/2006	The Mayor of Tofino announced that businesses had to close down over Labour Day as the town's sole water reservoir was near empty. A last-minute plan to truck water from Ucluelet prevented the shutdown; however, the incident cost the town hundreds of thousands of dollars in lost revenue.

APPENDIX C: WATER SUSTAINABILITY PLANNING FLOWCHART



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POLIS Project on Ecological Governance

Created in 2000, the POLIS Project on Ecological Governance is a research-based organization that is part of the Centre for Global Studies at the University of Victoria. Researchers who are also community activists work to make ecological thinking and practice a core value in all aspects of society and dismantle the notion that the environment is merely another sector.
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- Water Conservation and the Water Soft Path;
- The Water-Energy Nexus;
- Watershed Governance; and
- Water Law and Policy.

The WSP works with industry, government, civil society, environmental not-for-profits, and individuals to develop and embed water conservation strategies that benefit the economy, communities, and the environment. The WSP is an initiative of the POLIS Project on Ecological Governance at the Centre for Global Studies, University of Victoria.
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