

## **Integrating the Site with the Watershed and the Stream**

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A Watershed Blueprint for Hastings Creek: Creating the Future in the District of North Vancouver

# **Part B**

## **Framework for a ‘Course Correction’ Leading to a Watershed / Landscape-Based Approach to Community Planning**

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### **1. Regulatory Context**

- Land and Water: Stewardship Vision
- Integration of Regulatory Objectives and Collaboration
- Integrate the Site with the Watershed and Stream

### **2. Inter-Regional Education Initiative**

- Bridge the Implementation & Integration Gap
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- Convening for Action

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# Integrating the Site with the Watershed and the Stream

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## 1. Regulatory Context

The *Partnership for Water Sustainability in BC* (i.e. “the Partnership”) has embraced shared responsibility by helping the Province deliver elements of the Living Water Smart and Green Communities Initiatives. The vehicle for this collaboration is the *Water Sustainability Action Plan for British Columbia*, with a particular focus on the “Beyond the Guidebook” initiative.

### Land and Water: Stewardship Vision

The 45 actions and targets in *Living Water Smart* establish expectations vis-à-vis how land will be developed (or redeveloped) and water will be used. The *Green Communities Initiative* complements Living Water Smart and comprises plans, strategies and enabling tools to achieve the land and water stewardship vision. Together, the two initiatives represent a call to action:

- prepare communities for a changing climate
- choose to live water smart
- strive to build greener communities

Embedded within Living Water Smart is the *Water Sustainability Action Plan*. In turn, the Action Plan is the umbrella for the *Inter-Regional Education Initiative for ‘Rainwater Management in a Watershed Sustainability Context’* (i.e. “the IREI”).

***Beyond the Guidebook:*** At the heart of the IREI is ‘Beyond the Guidebook’, an ongoing initiative to provide local governments with the tools and understanding to integrate the Site with the Watershed and the Stream. Since 2007, the Beyond the Guidebook initiative has been building on the technical foundation created a decade ago when the Province and Environment Canada jointly released *Stormwater Planning: A Guidebook for British Columbia*.

## Integration of Regulatory Objectives and Collaboration

BC local government is among the most autonomous in Canada, and BC is perhaps the least prescriptive province. Historically, the Province has enabled local government by providing policy and legal tools in response to requests from local government. In general, the enabling approach means the onus is on local government to take the initiative.

A core premise underpinning the IREI is that – once informed - participating local governments will choose to reduce risk, improve watershed health, and comply with regulatory requirements and/or objectives (Figure 1).

***A Provincial Perspective:*** “The Ministry looks forward to aligning efforts with the Partnership in three regions — Vancouver Island, Lower Mainland and the Okanagan — to further advance implementation of the “**Beyond the Guidebook**” initiative; and provide communities with the tools and knowledge to protect and/or restore watershed health,” stated Cairine MacDonald, (former) Deputy Minister of Environment, in a September 2012 announcement. “The Ministry’s renewed emphasis on the rainwater management component of Liquid Waste Management Plans has created an opportunity to demonstrate how to integrate regulatory compliance and collaboration.”

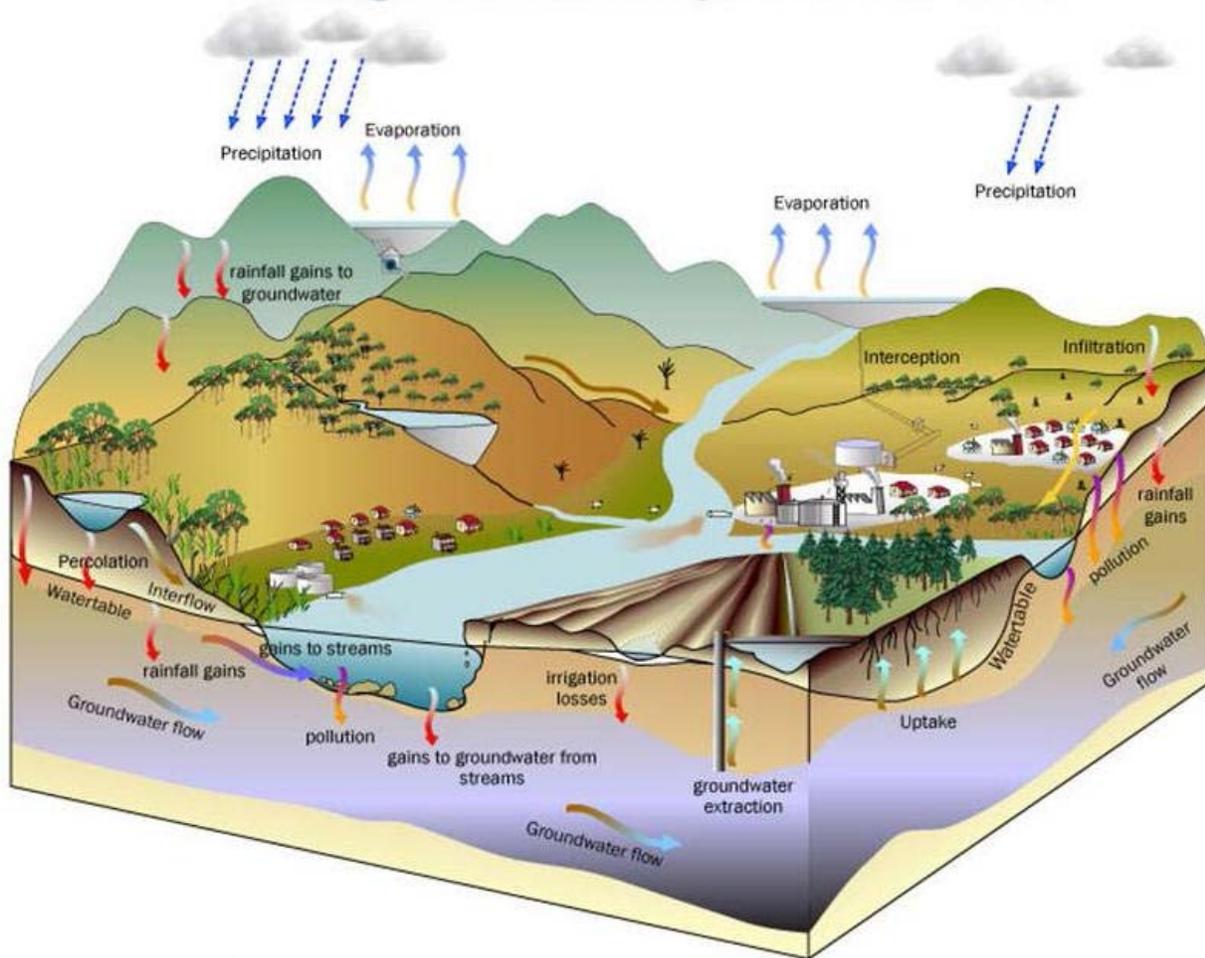


In Metro Vancouver, the spotlight is on a “course correction” in the way Integrated Stormwater Management Plans (i.e. “ISMPs”) are developed and implemented. The Hastings Creek Blueprint is a demonstration application of the “ISMP Course Correction”. North Vancouver is showing how to leverage more with the same resources.

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**Every local government has to  
manage the raindrops that fall on it**



*Mimic the **Water Balance** to reduce risk (both financial and environmental), improve watershed health, and comply with regulatory requirements or objectives*

Elements of the Water Balance

Figure 1

## Integrating the Site with the Watershed and the Stream

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### Integrate the Site with the Watershed and Stream

In BC, headwater tributary streams such as the Hastings Creek system are a predominant feature. Hence, watershed health is defined in terms of protection of aquatic habitat. Depending on whether servicing and infrastructure practices mimic the 'water balance', land development can represent either a problem or an opportunity.

**Impact of the Salmon Crisis:** "A generation ago, the ecosystem value of headwater streams was not fully appreciated. The result: streams were being lost as a consequence of rapid population growth and land development. This contributed to the decline of many wild salmon populations," states Peter Law, Chair of the Guidebook Steering Committee (2000-2002).



"The salmon is an icon and the early warning system when there is a problem. The salmon crisis of the 1990s was the catalyst for action. The goal of protecting stream health became a driver for doing business differently in BC."

**Science-Based Understanding Informs Policy and Practice:** "By 2002, the Province had developed and released *Stormwater Planning: A Guidebook for British Columbia*. This provided a science-based framework to guide development of the rainwater (stormwater) component of Liquid Waste Management Plans."

"The core premise of the Guidebook is that land development and watershed protection can be compatible. This also suggests that urban watershed restoration is achievable over time. The Guidebook signified a paradigm-shift. This resulted from recognition of HOW a science-based understanding could bridge the gap between high-level policy objectives and site design practices," concludes Peter Law.

**Mimic the Water Balance:** Figure 2 illustrates why land development practices must strive to mimic the 'Water Balance'. Otherwise, the 'Water Balance' will be short-circuited when the land surface is hardened with an ever-increasing proportion of roads and buildings, and below-ground flow paths to streams are eliminated. This short-circuiting means there will be TOO MUCH WATER during wet weather periods and TOO LITTLE WATER during dry weather periods.

"A decade ago, looking at rainfall differently led the Province to initiate a paradigm-shift in the way rainwater is managed. The Guidebook formalized the Water Balance Methodology in order to establish performance targets," states Peter Law.

"At the core of the Guidebook is a 'learn by doing' philosophy. The Water Balance Methodology is dynamic; and it is being enhanced over time to incorporate fresh insights resulting from science-based knowledge. North Vancouver initiatives continue to make a significant contribution to our understanding of the relationship between site development practices and watershed health."

Mimic the WATER BALANCE to Reduce Risk, Improve Watershed Health and Comply with Regulatory Requirements



Water Balance METHODOLOGY integrates Sites with the Watershed and the Stream

## Integrating the Site with the Watershed and the Stream

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An ever-increasing building footprint is short-circuiting the 'water balance'

Before: in 2007



After - in 2009



The 'water balance' is short-circuited when the land surface is hardened and below-ground flowpaths to streams are eliminated, such that:



**TOO MUCH WATER:**  
*stream erosion and instability during wet weather periods*

**TOO LITTLE WATER:**  
*fish will not survive during dry weather periods*

There are financial liability & sustainability consequences

Why Mimic the Water Balance

Figure 2

# Integrating the Site with the Watershed and the Stream

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## 2. Inter-Regional Education Initiative

The IREI focus is on actions related to land use and watershed health, with emphasis on the 'how-to' details of integration and implementation. Figure 3 references regions within the Georgia Basin where watershed-based strategies and programs for integrating the site with the watershed and stream are being advanced.

### Bridging the Implementation & Integration Gap

Collaboration is the pathway to a consistent approach to water sustainability and green infrastructure policies and practices within and between regions. Yet there is no formal mechanism to enable or facilitate inter-regional collaboration. The Partnership fills this gap.

The IREI will help all regions bridge the "implementation and integration" gap. Sharing, collaboration, alignment and consistency will accelerate effective watershed restoration and/or protection within each region. Everyone will go farther, more efficiently and effectively.

A program goal for the IREI is that local governments will leverage, and be more effective, with the same resources.

Everyone needs to agree on expectations and how all the players will work together, and after that each community can reach its goals in its own way



*"The 'regional team approach' is founded on partnerships and collaboration; and seeks to align actions at three scales – provincial, regional and local."*

Glen Brown, Executive Director  
BC Ministry of Community, Sport & Cultural Development  
& Deputy Inspector of Municipalities

September 2009

### Framework for Knowledge-Sharing

The technical foundation for the IREI is provided by the web-based Water Balance Model, a unique scenario comparison and decision support tool. Developed by an inter-governmental partnership, it can help communities create a vision for a future watershed condition because the performance target methodology embedded in the model integrates the Site with the Watershed and the Stream.

***Integrate the Site, Watershed and Stream:*** The IREI comprises inter-connected modules:

- Water Balance Model Training Workshops
- A Course on Watershed Blueprints
- Learning Lunch Seminars & Series
- Watershed Blueprint Case Profiles
- Primers in the Beyond the Guidebook Series

These program elements provide a consistent framework for knowledge-sharing within a region and between regions. Hastings Creek is important because it is a Blueprint Case Profile.

### ***Inter-Regional Relevance of Hastings Creek Demonstration Application:***

The IREI program showcases and builds upon the experience of those who are leading by example. Through the IREI, the Partnership encourages and facilitates cross-fertilization of approaches and experience.

The Hastings Creek Watershed Blueprint is provincially significant and precedent-setting. The District of North Vancouver is demonstrating HOW local governments can implement the 'ISMP Course Correction' and how they can accomplish more with the same investment.

The Hastings Creek approach has benefitted from the experience of other Georgia Basin leaders, and is *outcome-oriented*. Similarly, the work-in-progress Hastings Blueprint is already informing and influencing how other jurisdictions are likely to apply lessons learned by the District.

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Inter-Regional Education Initiative

Figure 3

### Explanatory Notes – Provincial Significance

- The Province intervened in the Comox Valley to both create a new regional district and mandate regional plans. The *Comox Valley Sustainability Strategy* and *Comox Valley Regional Growth Strategy* provide the planning framework for implementing **An Integrated Watershed Approach to Settlement**.
- The Nanaimo Region's **Drinking Water & Watershed Protection Plan** created a drinking water and watershed protection service area with taxation authority in the region's electoral areas. Because the scope has been expanded to include the member municipalities, this means the plan has more of a regional function.
- The **Cowichan Basin Water Management Plan** is a provincial case study for watershed governance changes being contemplated as part of *Water Act Modernization*.
- In the Capital Region, the Bowker Creek Watershed Blueprint and District of Sooke Rainwater Management Plan are demonstration initiatives for **Integrated Watershed Management**. Both are founded on partnerships that have enabled community groups and municipal staffs to coalesce around a shared vision: *What do we want this watershed to look like in 100 years, and what steps will we take to get there?*
- Metro Vancouver's **Integrated Liquid Waste & Resource Management Plan** established the framework for moving beyond regulatory compliance to transitioning the region to an approach where management of liquid discharges and rainwater resources is planned and implemented within a broader, sustainability framework.

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### Convening for Action

Figure 4 shows the “BC process” for developing local government talent. The District was a founding member of the Water Balance Model Partnership in 2002; and has played a major role in the continuing success of the *Outreach and Continuing Education Program*. North Vancouver experience is incorporated in the IREI curriculum.

#### **Water Balance Model Training Workshops:**

“We value the decade-long contributions by Richard Boase as a practitioner and teacher; and we appreciate that District support of our training workshops makes it possible for Richard to share his knowledge with his peers,” states Ted van der Gulik, Chair of the inter-governmental Water Balance Model Partnership.



“In early 2012, we brought together four regional districts, representing 90% of the Vancouver Island population, and we asked them to align their efforts to implement the IREI. All four Regional Boards passed a resolution committing to participation in the IREI.”

“By the end of 2012, we had successfully implemented a ‘proof of approach’ for the IREI. Each of the four regions hosted an IREI sharing and learning event or process. 24 local governments participated. We showcased North Vancouver innovation at training workshops hosted by the Capital Regional District and the Regional District of Nanaimo.

“In 2013, the IREI is moving from ‘proof of approach’ on Vancouver Island to full-scale implementation, including Metro Vancouver and beyond. Inter-regional collaboration will help leverage more with the same resources. Our vision is that everyone will be able to better deliver on regulatory objectives and compliance.”

**Pilot Course on Watershed Blueprints:** “The prototype for the IREI was the 2-day *Course on the ISMP Course Correction* hosted by the City of Surrey in November 2011. This inter-regional pilot brought together three jurisdictions that are ‘leaders by example’ (i.e. Capital Region, North Vancouver and Surrey). These leaders pooled their knowledge and experience to provide the course content,” continues Ted van der Gulik.

**Guiding Principles:** The IREI curriculum is founded on the set of outcomes (or principles) listed below. These are mutually reinforcing:

- Living Water Smart is the provincial **VISION** for sustainable land and water stewardship.
- TOP-DOWN & BOTTOM-UP** collaboration between local governments and the stewardship sector is a critical success factor for “getting the local watershed vision right”.
- An over-arching **WATERSHED GOAL** is to manage the natural environment and built environment as integrated components of a healthy watershed.
- The watershed goal can be achieved by making ‘green choices’ and **DESIGNING WITH NATURE** to protect the water balance.
- Inter-regional **KNOWLEDGE-SHARING**, collaboration, alignment and consistency will allow everyone to go farther, more efficiently and effectively, with implementation.
- Achieving the desired outcome is contingent on regulators, planners, developers, designers and others embracing **SHARED RESPONSIBILITY** and aligning their efforts.

“The experience of those leading watershed/ landscape-based processes demonstrates that systemic change is possible, even in the complicated sphere of planning for use and conservation of land. A key to long-term success is developing local government talent (Figure 4),” concludes Ted van der Gulik.

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*Richard Boase demonstrates how water moves through soil at a workshop hosted by the Urban Development Institute and held at BCIT in 2004*

### This is the "BC process" for moving from Awareness to Action

#### 1. WHAT is the issue?

The form of land development impacts how water is used and how water runs off the land.

#### 2. SO WHAT can be done?

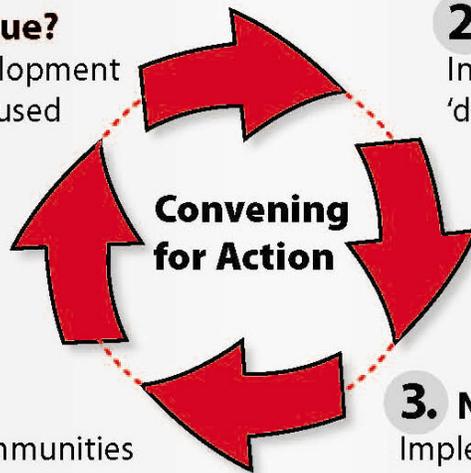
Influence practitioners to 'design with nature'

#### 4. THEN WHAT?

Replicate in other communities

#### 3. NOW WHAT can we do?

Implement the Water Sustainability Action Plan for British Columbia



Developing Local Government Talent

Figure 4

## Integrating the Site with the Watershed and the Stream

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### 3. ISMP Course Correction

ISMPs are a regulatory requirement as spelled out in the Metro Vancouver region's *Integrated Liquid Waste & Resource Management Plan* (i.e. "the ILWRMP"). When the Environment Minister approved the plan in May 2011, he also imposed requirements that link land use planning to the direction provided by the ISMPs. The conditions of plan approval focus attention on the how the degree, type and location of land development can affect the long-term health of watersheds.

#### Why a Course Correction

A decade ago, local governments were venturing into uncharted waters when undertaking ISMPs. However, over-emphasis on computer modelling and pipe analyses resulted in engineering-centric plans that were unaffordable and questionable.

The consequent paralysis drew attention to the need for a 'course correction' in the way ISMPs are approached. At the heart of the ISMP issue is the long-term dilemma of how to pay for infrastructure and watershed improvements if and when there is no source of funding.

**Create a Watershed Blueprint:** The regulatory driver means an ISMP is a potentially powerful tool. It can influence other municipal processes for the better. It can be the catalyst for integrated and coordinated action at a watershed scale.

A Watershed Blueprint is a truly integrated plan to restore watershed function over decades



"Agree on the vision. Set the targets. Provide the planners with the detail necessary to guide site level decisions as opportunities arise. Then implement."

Jody Watson, Chair  
Bowker Creek Initiative  
Capital Regional District  
October 2011

#### Nature of the ISMP Course Correction

Figure 5 encapsulates a side-by-side comparison of an ISMP versus Watershed Blueprint. A critical difference is that drainage-centric ISMPs are **output**-oriented whereas Watershed Blueprints are **outcome**-oriented, that is:

- Output-Oriented: "What is the capacity of the conveyance system, and how much will it cost to make the pipes larger?"
- Outcome-Oriented: "What do we want this place to look like in 50 or 100 years, and how will we get there?"

Figure 5 is guiding District staff as they develop the Hastings Creek Watershed Blueprint.

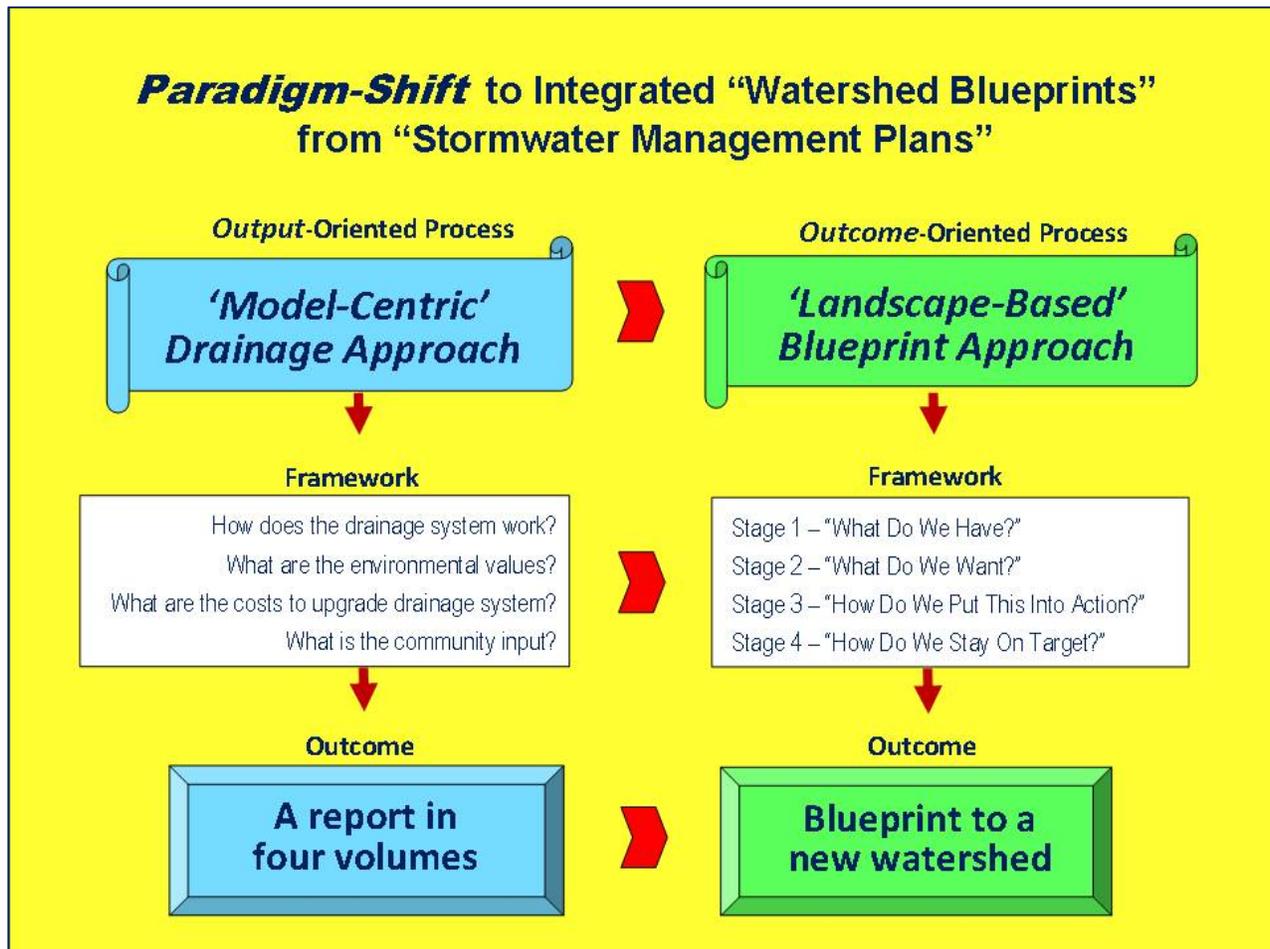
**A Watershed Blueprint is an Action Plan:** The term 'watershed blueprint' originated with the Bowker Creek Initiative in the Capital Region. For the purposes of the 'ISMP course correction', a *Watershed Blueprint*:

1. captures a community's vision of a desired future watershed condition;
2. is action-oriented and provides planning staff with the level of detail they need to effectively review individual development applications for conformance with the plan.
3. ensures that positive changes can happen incrementally, and that opportunities can be capitalized on as and when they arise;
4. identifies specific opportunities to restore watershed function and implement green infrastructure that is 'built right; and
5. is implemented over a period of decades because change can be slow in a developed watershed.

Efficient and effective development of a Blueprint depends on those with local knowledge being at the "blueprint table" to share their knowledge. Integration of community and inter-departmental perspectives will ensure sound solutions.

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Nature of the ISMP Course Correction

Figure 5

## Integrating the Site with the Watershed and the Stream

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### Hastings Creek Watershed Blueprint

While the *Hastings Creek Watershed Blueprint* is a work-in-progress, the District's innovative approach is already gaining recognition for establishing a provincially significant precedent.

Key building blocks are in place. A picture of what a desired future watershed condition would look like is taking shape. Tools are being tested to enable implementation of policies and actions.

Thus, the 'emerging blueprint' is now being viewed by many in the same light as the Capital Region's *Bowker Creek Watershed Blueprint*.

#### ***Better Delivering on Regulatory Compliance:***

Completed in 2010, Bowker Creek has gone well beyond any other plan in BC in terms of how it has achieved consensus, within and across municipal boundaries (i.e. Victoria, Saanich and Oak Bay); and how it has galvanized political commitment to move from planning to action on the ground. Together, Bowker and Hastings are informing a provincial 'course correction' in how to develop a 'watershed blueprint' that is affordable, effective, and creates a legacy.

The Hastings process is adapting lessons learned from the Bowker experience, and is taking blueprint development to another level. The work-in-progress Hastings Creek Watershed Blueprint will be GIS-enabled and interactive. It is already informing operational actions and future planning.

Furthermore, the deliverables are positioning the District to demonstrate that it is complying with the actions spelled out in the region's ILWRMP and in the Minister's conditions of approval. Figure 6 lists regulatory requirements. Actions are linked because implementation of a Watershed Blueprint depends on supporting bylaws and neighbourhood design guidelines.

To reduce risk, both financial and environmental, it follows that land development practices must strive to mimic the Water Balance (Figure 1).

#### ***Lynn Valley Town Centre - Driver for Action:***

In June 2011, the District adopted its updated Official Community Plan (OCP). This designates the Lynn Valley as one of two Town Centres. The existing Lynn Valley Mall is at the heart of the future Town Centre.

Viewed in the context of watershed health, redevelopment to accommodate higher density land use creates both risks and opportunities. Hence, the *Lynn Valley Town Centre* is the driver for action by the District to demonstrate how the Hastings Creek Blueprint will better deliver on regulatory compliance.

***Water Balance Goal:*** After re-development, each site will function as it did before, or better!

#### ***Foundation Blocks for the Hastings Blueprint:***

The District's approach has been systematic and the Blueprint is progressing to completion. The stage is now set for compilation and consolidation of relevant information and actions in an Executive Summary. Five blocks of major work provide the technical foundation for the Hastings Creek Watershed Blueprint:

- Lynn Valley Town Centre
- Partnership with University of British Columbia for Applied Research
- Drainage Infrastructure Screening Tool
- Geomorphology and Ecological Opportunities Assessment
- Water Balance Model Express for Landowners

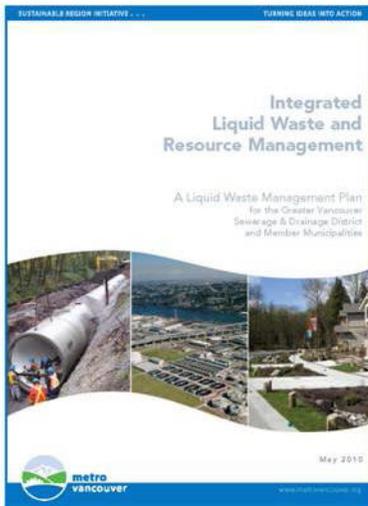
In the sections that follow, each 'foundation block' is described. The emphasis is on relevance and application. This will help District staff prepare a concise Executive Summary. A key message is this: ***The Blueprint is much more than a report. It is an online decision support tool: map-based; and inter-departmental in application.*** This approach positions the District to capitalize on opportunities as and when they emerge.

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Actions for on-site rainwater management are spelled out in the “ILWRMP”

Metro Vancouver and municipalities will:



1.1.12 - Facilitate region-wide strategies and actions

1.1.20 - Update bylaws

1.1.21 - Update neighbourhood design guidelines

3.4.7 - Develop & implement ISMPs (“Watershed Blueprints”)

3.5.9 - Report out annually to MOE

Regulatory Requirements

Figure 6

## **Integrating the Site with the Watershed and the Stream**

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