Convening for Action in Metro Vancouver

The Story of the 2009 Water Balance Model Forum

(Hosted by the City of Surrey)

Living Water Smart and Making Green Choices to
Create Liveable Communities and Protect Stream Health

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The Story of the Water Balance Model Forum hosted by the City of Surrey

Moving Beyond Pilot Projects to a Broader Watershed Objectives Approach

Preface

This consolidated document comprises the set of six stories that were published on the Water Bucket website to tell the story of the **Metro Vancouver Water Balance Model Forum**. Hosted by the City of Surrey, the Forum program was built around the ***HOW question*** as it pertains to green infrastructure:

- HOW will the City of Surrey get it built right;
- HOW will a consistent regional approach be achieved in Metro Vancouver?

"The Forum was a success," reports **Remi Dubé**, Drainage Planning Manager with the City of Surrey, and the individual responsible for developing the morning program. "We have been getting some pretty good feedback from many of the people who attended the workshop (specifically developers and consultants). It's leading into more direct communication with certain developers who are looking at different approaches ... they seemed encouraged with the dialogue that the forum appeared to promote."

The Series Explained

- On February 2nd, Story #1 titled ***Living Water Smart and Making Green Choices to Create Liveable Communities and Protect Stream Health*** introduced what would be covered in the morning and afternoon sessions.
- On February 11th, Story #2 titled ***Making Green Choices: Opportunities for Law and Policy to Effect Change on the Ground*** introduced the shared responsibility theme, and provided the bridge from the morning to the afternoon.
- On February 18th, Story #3 titled ***Green Infrastructure in the City of Surrey: "Getting it built right"*** elaborated on the learning outcomes for the Forum morning session.
- On February 25th, Story #4 titled ***Making Green Choices: Use the Water Balance Model to Inform Land Development Strategies*** foreshadowed how regulators and designers can apply the Water Balance Model to facilitate implementation of green infrastructure solutions.
- On March 4th, Story #5 titled ***Provincial Context: Today's Expectations are Tomorrow's Standards for Green Infrastructure*** presented cascading provincial, regional and local perspectives.
- On March 23rd, Story #6 titled ***Convening for Action in Metro Vancouver to Get Green Infrastructure Built: Moving Beyond Pilot Projects to a Broader Watershed Objectives Approach*** documented the Forum outcomes.

Convening for Action in Metro Vancouver

Getting Green Infrastructure Built: Moving Beyond Pilot Projects to a Broader Watershed Objectives Approach

Handout at Water Balance Model Forum on March 12, 2009

Convening for Action in Metro Vancouver
Getting Green Infrastructure Built

Moving Beyond Pilot Projects to a Broader Watersheds Objectives Approach

THE CHALLENGE: *How do we simultaneously work together as staff within a municipality and as a region AND externally with developers and other private sector players, to ensure we implement sustainable approaches to development*?

"The best laid plans…."

The problem is the gap between design and build
How to ensure that the best laid plans come to fruition?
How to get all the actors singing from the same song sheet?

To get to the big picture, it starts with the smallest pieces. For this reason, the Surrey Forum is advancing a regional team approach that aligns local actions with provincial policy goals as articulated in the Living Water Smart and the Green Communities initiatives. Making this happen requires partnerships, collaboration, innovation and integration.

We see the Forum as providing an opportunity to generate positive energy in the region. In particular, the Forum will inform the actions identified in the rainwater/stormwater component of Metro Vancouver's updated Liquid Waste Management Plan. We believe this is where the opportunity for implementing a regional team approach resides.

We anticipate that the Forum sharing sessions will show that there are solutions if people talk to each other about what they each could do differently. This will help all parties collaborate to more effectively fulfil their piece of the sustainable development puzzle.

Once we know what we want our watersheds and neighbourhoods to look like, the next step is to decide *what the tools are that will get us there*. All of us ….whether we are regulators, developers or designers ….need to understand and care about the goal if we are to create the future that we all want.

Ted van der Gulik, P.Eng.
(BC Ministry of Agriculture & Lands)
Chair, Inter-Governmental Partnership

Vincent Lalonde, P.Eng.
(City of Surrey)
General Manager, Engineering

Raymond Fung, P.Eng.
(District of West Vancouver)
Chair, Green Infrastructure Partnership

WATER Balance MODEL Powered By QUALHYMO

CITY OF SURREY the future lives here.

MMCD BCWWA British Columbia West Coast Environmental Law
Green Infrastructure Partnership

Forum Program – *An Overview*

The Forum program was built around the *HOW question* as it pertains to green infrastructure: HOW will the City of Surrey ensure it gets built right; HOW will a consistent regional approach be achieved in Metro Vancouver?

The morning and afternoon parts of the program each comprised three modules. The Forum was designed to start a dialogue between policy-makers and project implementers.

Sharing of Perspectives

Examples inform policy. The case studies in the morning session provided the policy people with an appreciation for what is involved in constructing green infrastructure. The afternoon session then provided the implementers with an understanding of provincial, regional and local goals…and what they are intended to achieve.

The Story of the Forum

A set of five stories has been published on the Water Bucket Website. These tell the story of the Forum by describing the scope of each module and connecting the dots. To access these stories, go to waterbucket.ca and follow this pathway:

Convening for Action » On the Ground Changes » Metro Vancouver

What You Should Remember - *Key Messages*

The Forum program was comprehensive in scope and intensive in detail. A key message for each module is therefore synthesized as follows for ease of reference:

1. Establishing Expectations:
   A decade of experience has enabled the City of Surrey to move beyond pilot projects to a broader watersheds objectives approach to rainfall capture and green infrastructure
   .
2. East Clayton Lessons Learned:
   Establish watershed targets that are characteristic of actual conditions, and are achievable.
3. Effective Implementation of Green Infrastructure: Making it Work
   Getting it built right is a shared responsibility; and depends on collaboration among regulators, developers and designers.
4. Today's Expectations are Tomorrow's Standards for Green Infrastructure:
   A provincial policy framework is now in place that enables municipalities to align efforts at a regional scale, make green choices, prepare communities for change, and choose to be water smart.
5. Making Green Choices: Opportunities for Law and Policy to Effect Change:
   Policy, approved standards and legal tools can help regulators, developers and designers collaborate to ensure responsible outcomes.
6. Use the Water Balance Model to Inform Land Development Strategies:
   Planning and water balance modeling need to be done together, and the WBM is a tool that enables integration, especially when there is a commitment to integrate land planning and green infrastructure.

Agenda Overview – This is what we achieved

Before Lunch

0900 – 1200

Green Infrastructure in the City of Surrey: "Getting it built right"

1. **Context and Overview: Establishing Expectations**
   (30 minutes)
   - Described the forum's 2-part structure and identified learning outcomes
   - Described the evolution of drainage planning in Surrey
   - Described key neighbourhoods that embody the Surrey sustainability vision
2. **East Clayton Sustainable Community: Lessons Learned On-the-Ground**
   (45 minutes)
   - Summarized the sustainability context
   - Reviewed implementation experience for private and public rainfall capture systems
   - Reflected on lessons learned
3. **Effective Implementation of Green Infrastructure: Making it Work in Surrey**
   (90 minutes)
   - Introduced a selection of innovative measures for rainfall capture
   - Shared and reflected on the Grandview Heights experience
   - Shared and reflected on the South Newton experience

After Lunch

1300 - 1500

Alignment of Regional Actions with Provincial Goals and Objectives

4. **Provincial Context: Today's Expectations are Tomorrow's Standards for Green Infrastructure**
   (30 minutes)
   - Recapped the morning outcomes and the direction in which Surrey is heading, and why
   - Stated learning outcomes for the afternoon session
   - Elaborated on over-arching provincial policy framework
   - Summarized the Vancouver Island pilot program and emerging 'regional team approach'
   - Described how the Forum can inform the Metro Vancouver Liquid Waste Management Plan
5. **Making Green Choices: Opportunities for Law and Policy to Effect Change on the Ground**
   (60 minutes)
   - Introduced the Green Infrastructure Guide
   - Reviewed the Commentary on Effective Municipal Rainwater/Stormwater Management
   - Conducted a town hall discussion that bridged from the morning to a regional team approach
   - Set the scene for Topic #6 by examining Table 1 (Watershed Targets) in the Commentary
6. **Making Green Choices: Use the Water Balance Model to Inform Land Development Strategies**
   (90 minutes)
   - Described where we are and how we got here
   - Demonstrated how the WBM can be used to set performance targets at different scales
   - Conducted a town hall discussion that explores WBM applications to support green infrastructure
   - Concluded by describing "what is coming next"

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Community Development

Local Government Infrastructure and Finance
PO Box 9838 Stn Prov Govt
(4th Floor - 800 Johnson Street)
Victoria BC V8W 9T1

CIRCULAR

Circular No. 09:03
ARCS File #: 195-20

February 10, 2009

To: All Municipal and Regional District Chief Administrative Officers, Engineers and Planners

Re: *Beyond the Guidebook* - Context for Rainwater Management and Green Infrastructure in British Columbia

Beyond the Guidebook reflects a 'design with nature' approach to climate change adaptation. *Beyond the Guidebook* was released in June 2007 as a guidance document to introduce a methodology for correlating green infrastructure effectiveness in protecting stream health through using a pragmatic approach to achieve performance targets based upon rain water balance.

The ongoing *Beyond the Guidebook* provincial initiative builds on the guidance provided in the original *Stormwater Planning: A Guidebook for British Columbia*. In 2008, Vancouver Island was home of the pilot region for a regional team approach to rainwater management and green infrastructure implementation. Partnerships and the Vancouver Island Learning Lunch Seminar Series enabled capacity building for stakeholders, local municipal staff, developers and consultants.

The Water Balance Model for British Columbia is a web-based decision support tool that provides easy access to the *Beyond the Guidebook* approach and is available at http://bc.waterbalance.ca/. This tool bridges engineering and planning and links the site to the stream and watershed. The Ministry of Community Development is a member of the inter-governmental partnership that develops and maintains the Water Balance Model. The Guidebook and supplementary guidance documents are downloadable from the website.

Over time, sustained application of the water balance methodology can help local governments protect and/or restore stream health.

Beyond the Guidebook supports and/or complements other provincial initiatives, notably: Living Water Smart, the Green Communities Project and A Guide to Green Choices. Collectively, these initiatives establish expectations that, in turn, will influence the form and function of the built environment in general and green infrastructure on the ground in particular.

For more information regarding the *Beyond the Guidebook* initiative and infrastructure grant programs, please contact the Local Government Infrastructure and Finance Division at 250 387-4060.

Glen Brown
Executive Director
Local Government Infrastructure and Finance

Commentary on Effective Municipal Rainwater/Stormwater Management and Green Infrastructure to Achieve Watershed Health

Prepared Jointly By

April 2008

Commentary on Effective Municipal Rainwater/Stormwater Management and Green Infrastructure to Achieve Watershed Health

The *Local Government Act* vests the responsibility for drainage with municipalities, and British Columbia case law makes clear the responsibility of municipalities to manage runoff volume to prevent downstream impacts. An increasingly important corollary to that responsibility is the need to work from the regional down to the site scale, to maintain and advance watershed health to ensure that both water quantity and quality will be sustained to meet both ecosystem and human health needs.

The *Local Government Act* empowers municipalities with extensive and very specific tools to proactively manage the complete spectrum of rainfall events. These tools enable them to achieve watershed goals and objectives that are established under Integrated Stormwater Management Plan (ISMP) processes.

The Ministry of Community Services is the lead Ministry for rainwater management and green infrastructure; and has a mandate to leverage the Green Communities Project to advance implementation of green infrastructure province-wide. To influence the greening of the built environment, Ministry policy is that "*today's expectations are tomorrow's standards*".

Beyond the Guidebook: The New Business As Usual (2007),(available at www.waterbalance.ca), builds on *Stormwater Planning: A Guidebook for British Columbia* (2002) and provides key guidance to the new provincial approach. Validated through Metro Vancouver pilots, *Beyond the Guidebook* advances a performance target methodology for correlating green infrastructure effectiveness in protecting stream health. This initiative incorporates lessons learned over the past six years in order to help municipalities establish what performance targets makes sense at the site, catchment and watershed scales.

Now that prerequisite tools and resources exist, a key to success of ISMPs in meeting the goal of maintaining or improving watershed health as communities grow and redevelop will be the effective integration of rainwater management techniques and green infrastructure in land use planning, plus follow-through upon ISMP implementation, integrated from the regional down to the site scale.

Strategies for integrating drainage actions with other policy and actions, to be truly effective, include:

- Identification and protection of natural green infrastructure (green space and Environmental Sensitive Areas) that performs multiple services
- Reduction of watershed load through effective land use planning and urban containment
- Incorporation and retrofitting of engineered green infrastructure technologies into development plans
- Use of the *Water Balance Model powered by QUALHYMO* to set performance targets at the site, catchment and watershed scales
- Adjustment of bylaws and policies to support objectives and desired outcomes
- Plan performance monitoring and follow-up to adapt and adjust to lessons learned
- Budgeting that anticipates administrative and operations support

A desired outcome is to create neighbourhoods that integrate good planning and innovative engineering designs, for overall greater environmental, social and economic sustainability.

Through an integrated planning process, Table 1 below identifies actions that can be taken by municipalities to create liveable communities and protect stream health.

Table 1 – Framework for Moving from Planning to Action

Action	Level of Commitment
Complete and implement integrated rainwater/stormwater management plans that are **affordable and effective i**n protecting Watershed Health	• Municipalities develop ISMPs that enable implementation of integrated strategies for greening the built environment; and include establishing watershed-specific runoff targets (for managing the complete rainfall spectrum) that make sense, meet multiple objectives, are affordable, and result in net environmental benefits at a watershed scale.
	• Municipalities establish watershed targets that are characteristic of actual conditions in watersheds, recognizing that there will be different strategies for already developed versus partially developed watersheds
	• Municipalities evaluate the acceptability of watershed-specific runoff targets on the basis of an evaluation framed by these three questions: 1. What target will achieve the watershed health objective? 2. What needs to be done to make the target achievable? 3. Do the solutions meet the test of affordability and multiple objectives?
	▪ Municipalities implement green infrastructure solutions that result in effective rainfall management at the site, catchment and watershed scales.
Embed ISMP strategies in neighbourhood concept plans	• Municipalities develop rainwater/stormwater and land use plans through an inter-departmental process that is collaborative and integrated. • Municipalities provide guidance as to how watershed-specific targets can be met at the development scale.

The **Water Balance Model powered by QUALHYMO** is a public domain, on-line decision support and scenario modeling tool for promoting rainwater management and stream health protection through implementation of "green" development practices. This tool demonstrates how to achieve a 'light hydrologic footprint', and will help build bridges between planners and engineers; and underpins *Beyond the Guidebook: The New Business As Usual*.

The methodology embedded in the *Water Balance Model powered by QUALHYMO* enables a watershed target to be established; it also enables the user to assess how to meet the watershed target at the site scale. Accompanying this commentary is a paper titled *Beyond the Guidebook: Establish Watershed-Specific Runoff Capture Performance Targets* that was released at the 2008 Water Balance Model Partners Forum.

Beyond the Guidebook: The New Business As Usual
Create Liveable Communities & Protect Stream Health

Establish Watershed-Specific Runoff Capture Performance Targets

By

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And

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February 2008

[1] Project Manager & Principal Author, **Stormwater Planning: A Guidebook for British Columbia, 2002**

An initiative under the umbrella of the Water Sustainability Action Plan for British Columbia

Establish Watershed-Specific Runoff Capture Performance Targets

Identify what needs to be done at the site scale to prevent stream erosion and protect stream health

In 2002, **Stormwater Planning: A Guidebook for British Columbia** articulated a principle that performance targets at the watershed scale provide a starting point to guide the actions of local government in the right direction. The objective is to translate those targets into appropriate site design criteria that then provide local government staff and developers with practical guidance for achieving the goal of stream protection.

The methodology embedded in the **Water Balance Model powered by QUALHYMO** enables a watershed target to be established; it also enables the user to assess how to meet the watershed target at the site scale. The critical consideration is that the watershed target be characteristic of conditions in the watershed. When establishing a watershed-specific discharge target, three fundamental questions need to be answered:

1. Could the target be achieved?
2. If it could be achieved, how would it be achieved?
3. Should the target be achieved?

The litmus test for an acceptable **Watershed Target** is that the resulting RAINwater management solutions make sense, are affordable and result in net environmental benefits at a watershed scale. For a performance target to be implemented and effective, it must have feedback loops so that adjustments and course corrections can be made over time.

1. Defining a Target Condition

A physically-based target condition can be established based on an understanding of geomorphology and stream characteristics. In order to be achievable, the target condition must be translated into performance targets that can be applied to RAINwater management practice.

Since changes in Water Balance and hydrology are the primary source of rainwater runoff impacts on stream health, it is especially important to establish performance targets for managing **RUNOFF VOLUME** and **RUNOFF RATE**. In 2002, the Guidebook introduced the Water Balance Methodology for:

- Developing watershed performance targets based on site-specific rainfall data, supplemented by streamflow data (if and when available) and on-site soils investigations; and
- Translating these performance targets into design guidelines that can be applied at the site level to mitigate the impacts of land development.

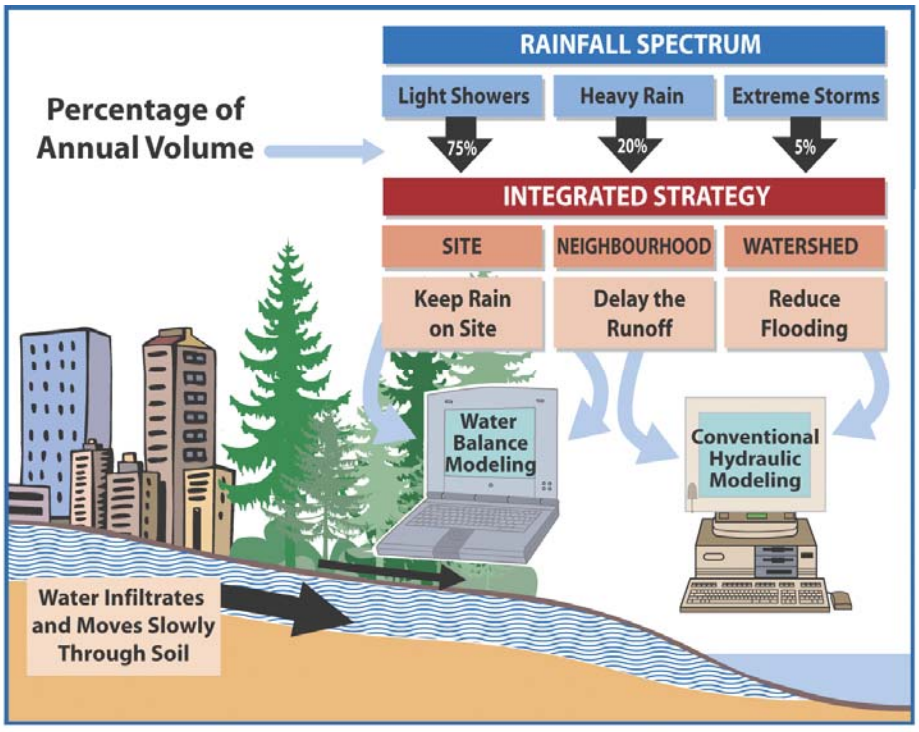
The Guidebook emphasizes that performance targets and rainwater management practices be optimized over time based on monitoring the performance of demonstration projects; and strategic data collection and modeling. As success in meeting performance targets is evaluated, rainwater management programs can be adjusted because: **We change direction when the science leads us to a better way**.

2. Relationship of Rainfall Spectrum to Watershed Objectives

The Guidebook introduced the concept of **performance targets** to facilitate implementation of the *integrated strategy* for managing the complete rainfall spectrum. To create a mind-map for practitioners, the rainfall spectrum was defined in terms of three tiers, with each tier corresponding to a component of the integrated strategy, namely:

- **Rainfall Capture** - keep rain on site by means of 'rainfall capture' measures such as rain gardens and infiltration soakaways
- **Runoff Control** - delay overflow runoff by means of detention storage ponds which provide 'runoff control'
- **Flood Mitigation** – reduce flooding by providing sufficient hydraulic capacity to 'contain and convey'

The concept of **rainfall tiers** simply enabled a systematic approach to data processing and identification of rainfall patterns, distributions and frequencies.



Historical Context:

For convenience, and to provide a starting point for analysis, the Guidebook referenced the three tiers to a value defined as the **Mean Annual Rainfall** (MAR). As our understanding of what is achievable through 'rainwater management' has grown, we have moved beyond this early concept. Looking back:

- The MAR concept was introduced in part to provide consistency with the *1992 Land Development Guidelines.*
- It established a point of departure that was familiar to practitioners so they would readily make the transition to a new way of thinking.
- In 2002, focussing attention on the MAR facilitated a paradigm-shift in the state-of-the-practice.

The MAR was introduced in order to focus attention upon what could be done at the site level, while assuming there would be benefits to the watershed and streams. Our knowledge is progressing and we now see a need to begin to evaluate the total spectrum of rainfall and resulting runoff that flows into streams from the surrounding watershed.

Of relevance and importance, our current understanding of runoff processes leads us to acknowledge that rainfall does not equal runoff; that the physical processes are complex; and that applying rainfall capture targets may be overly simplistic. A more rigorous, yet simple analytical methodology has been developed to address this issue.

3. Performance Targets

Defining a Runoff Volume Target:

In 2002, the science was explicitly telling us that major biophysical changes occur once the impervious percentage of a watershed reaches about 10%. Beyond this threshold, the change in the Water Balance triggers watercourse erosion, which in turn degrades and /or eliminates aquatic habitat.

In 2002, the science was explicitly telling us that where urban use densities are produced, the focus should be on what needs to be done at the site level to effectively mimic a watershed with only 10% impervious area, and in so doing reduce runoff volume to the same 10% level.

A Starting Point for Early Action:

In 2002, the Guidebook addressed the question of what could be done at the site level to protect watershed health; and presented the following rationale for early action (reference: page 2-11):

"The financial and staff resources of local government are limited. Therefore, those resources must be invested wisely to maximize the return-on-effort. Common sense says that the best return will be at the site level where local government exerts the most influence, and can therefore make a cumulative difference at the watershed scale.

Common sense says that we now have sufficient science-based knowledge and understanding for local government to make some decisions, and to get on with implementing early action in at-risk areas. More data to refine the science is desirable when there is time and resources; however, there will be situations where excessive data collection becomes a barrier to effective action in the face of an immediate risk.

Strategic data collection is required to understand the historic Water Balance, the current Water Balance if the watershed is partially developed, and the proposed changes to land use in the watershed.

Looking ahead, the objectives of most Integrated Stormwater Management Plans (ISMPs) will include trying to maintain or restore the natural Water Balance as development or re-development proceeds. Improved understanding of how to do that will evolve through demonstration projects that test and refine solutions to aquatic habitat and receiving water quality challenges."

Defining What is Achievable:

To provide a starting point for early action, the Guidebook referenced the Water Balance Methodology to a **healthy watershed**, defined as one where the proportion of impervious area is below the 10% threshold for runoff volume. As noted in the previous section, the Guidebook defined **rainfall tiers** to enable a systematic approach to data processing and identification of rainfall patterns, distributions and frequencies.

A key finding was that the frequently occurring, light to medium rainfalls account for 90% of the total annual rainfall volume. This established that rainfall capture is achievable. This finding provided the initial basis for establishing a Rainfall Capture Target to prevent surface runoff from the *impervious* portions of a development site; however, the Guidebook also cautions that (reference: page 6-20):

"Establishing a rainfall capture target provides a starting point that is based on the characteristics of a healthy watershed. The next step is to determine what is achievable and affordable based on assessments of constraints and opportunities in individual catchments.

Based on these assessments, catchment-specific performance targets and design guidelines for achieving these targets can be established. These catchment-specific targets and guidelines will then provide direction for all land development projects within each catchment."

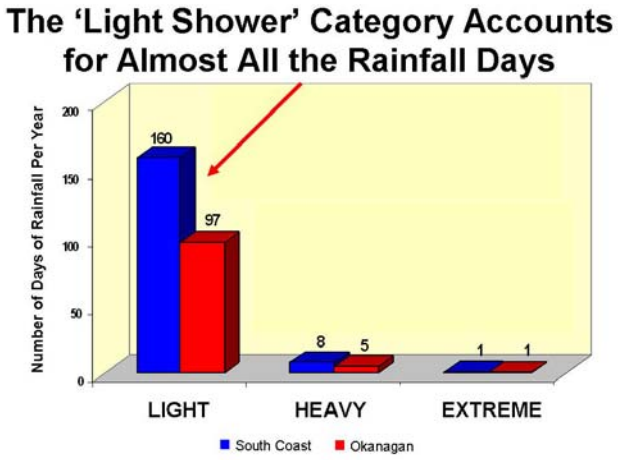
Defining a Runoff Rate Target:

The Guidebook emphasizes that a combination of Runoff Capture and Rate Control is necessary to mimic the rate of interflow in a naturally vegetated watershed. Interflow is defined as the portion of rainfall that soaks into shallow ground and moves slowly through soils to streams. To provide a starting point for early action in achieving runoff control, the Guidebook identified the goal of **maintaining the natural Mean Annual Flood** as the runoff rate target.

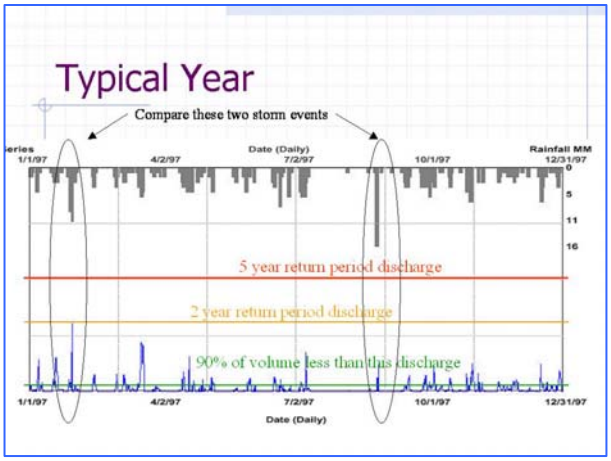
The Mean Annual Flood (MAF) is defined as the channel-forming event; as the MAF increases with development, stream channels erode to expand their cross-section, thereby degrading aquatic habitat. Therefore, the Guidebook states that an appropriate runoff rate target is to ensure that streamflow rates that correspond to the natural MAF occur no more than once per year, on average.

Building on the Guidebook Foundation:

It is in addressing the inter-relationship between Runoff Capture and Rate Control that **Beyond the Guidebook** picks up where the Guidebook left off in 2002. Looking back, the Guidebook focused attention upon the site level while assuming there would be benefits to the watershed and streams. Our knowledge is progressing and we now see a need to begin to evaluate the total spectrum of rainfall and the flows entering the streams from the watershed.



A simple chart of rainfall and stream flow for a typical year follows and shows some of the complex processes involved in the watershed between the time rain falls and when it reaches the stream. This leap in our knowledge plus the development of the tools available to assess these relationships allows us to go **Beyond the Guidebook** in establishing reasonable and achievable performance targets. The next step in advancing our knowledge allows us to focus upon the stream, the critical item that is so important to the environment.



This hydrograph for a 'typical year' illustrate the variable response of a watershed to rainfall. Two events are highlighted in the graphic. The larger of the two rainfall events resulted in much less runoff. As can be seen from the hydrograph, the smaller of the two rainfall events was preceded by a period of wet weather such that more runoff resulted.

The hydrograph also shows that 90%of the total annual runoff volume corresponds to a very small runoff rate. The implication of this finding is that it we can easily manage 90% through rainfall capture measures. For the other 10%, it is a matter of detaining and conveying in accordance with the integrated strategy for managing the complete rainfall spectrum. Further, that retaining 90% on site would have little effect on peak runoff rates unless other practices are brought to bear. This implies that retaining 90% of the rainfall is only a part of the requirement for an effective rainwater management system.

Runoff-Based Approach:

Over the past five years, experience has shown that landscape-based measures for rainfall capture are typically low risk, especially when they reflect an understanding of how to employ soil depth and planting coverage to best advantage. This experience has set the stage for the next leap forward – which is to apply a 'runoff-based approach' to rainwater management at a watershed scale.

Runoff Basis

- ❑ Flow duration for habitat availability
- ❑ Tractive force to measure potential erosion
- ❑ Sediment washoff to evaluate water quality
- ❑ Optimize systems to manage the impacts of the altered hydrologic cycle
- ❑ **Test** mitigation works **prior** to construction

The runoff-based approach provides the analytical foundation for the **Water Balance Model powered by QUALHYMO**. A primary benefit of this approach is the use of continuous simulation using long-term records to calculate runoff means that the frequencies and durations of various watershed conditions can be estimated easily.

Stream Health Methodology:

The strength of QUALHYMO resides in the flow exceedance analysis. This capability leads directly into the **Stream Health Methodology** which is a function of flow duration, and hence stream erosion. (Refer to the adjacent images.)

Several qualitative indicators can be utilized in assessing the potential for erosion or sediment accumulation within a watershed. The methodology is based upon shear stress as applied to the stream bed and banks over time. This is a measure of the energy available to cause erosion in a stream. Continuous simulation is the key to evaluating multiple development scenario comparisons.

QUALHYMO can simulate water and can add sediments and first order constituents to the analysis process. Because we can calculate how much energy is available in a stream, we can then compare scenarios to determine the most effective combination of rainfall capture measures on development sites.

Duration of Discharge

- ❑ Critical to aquatic health
  - Discharge is linked to stream health
- ❑ It can be measured and verified
- ❑ Computer simulations for duration of:
  - Flood discharges
  - Base flows
  - Fish habitat availability (depth vs duration)

Stream Erosion

- ❑ Calculate stream power
- ❑ Estimate potential erosion
- ❑ Identify critical stream reaches for protection and enhancement
- ❑ Create watershed / stream specific plans

4. The Need for Flexibility in Setting Performance Targets

Establishing performance targets provides a quantifiable way of measuring success in protecting or restoring a watershed, and for identifying what needs to be done to achieve a certain level of protection for a given watershed.

The runoff volume and rate targets presented in **Chapter 6 of the Guidebook** provide a reference point that is based on the Water Balance and hydrology of a healthy watershed. To determine whether these targets are realistic or achievable for a given watershed (reference: page 6-8), the Guidebook states that an Integrated Stormwater Management Plan (ISMP) must answer the following questions:

- What is the existing level of annual runoff volume? What percentage of total annual rainfall volume does it represent? What is the existing Mean Annual Flood (MAF)?
- What are acceptable levels of runoff volume and rate in terms of flood risk and environmental risk? What are the consequences of increased or decreased flows related to land development? Are these consequences acceptable?
- What actions are needed to avoid flooding or environmental consequences?
- How can necessary actions be staged over time?
- Are the targets to maintain 10% runoff volume and maintain the natural MAF necessary or achievable over time? If not, what levels are?

The Guidebook emphasizes the need for flexibility in setting performance targets (page 6-8):

"Performance targets that are based on the characteristics of a healthy watershed, including targets for runoff volume, runoff rate, and any other indicators that may be used to define a target condition, should be used as a starting point. Performance targets should be customized for individual watersheds and catchments, based on what is effective and affordable in the context of watershed-specific conditions.

For example, the 10% runoff volume target may not be appropriate for a watershed with limited fisheries value. In this case it may be more appropriate to establish targets for reducing the volume and rate of runoff based on judgements regarding acceptable levels of flooding.

Continuous Water Balance modeling can be applied to determine what is effective and affordable."

To be understood and effective, a performance target needs to synthesize complexity into a single number that is simple to understand and achieve, yet is comprehensive in scope. A **runoff volume-based** performance target for rainfall capture and rate control fulfills these criteria.

Further information regarding the runoff volume characteristics of the watershed must be determined. There are many documented instances where the runoff is in excess or 10%. If the natural runoff volume exceeds 10% then the post development condition must also exceed 10%.

Achieving the Target Condition at the Site Level:

The Guidebook states that (reference: page 6-5):

"Degradation of watershed health is the result of the cumulative impact of individual land development projects on runoff volume and rate (i.e. incremental changes in Water Balance and hydrology). Each development project contributes to increased runoff volume and rate in downstream watercourses.

In order to achieve the target condition for a healthy watershed as a whole, cumulative impacts must be managed at the site level. This means that rainwater systems at the site level must be designed to achieve the runoff volume and rate targets."

5. Use Performance Targets to Quantify Watershed Objectives

The Guidebook states that, in general, a watershed planning process must address the following fundamental question (reference: page 9-1):

- "How can the ecological values of stream corridors and receiving waters be protected and/or enhanced, and drainage-related problems prevented, while at the same time facilitating land development and/or redevelopment?"

As discussed in the Guidebook, performance targets provide a quantifiable way of measuring success in protecting (or restoring) a watershed, and for identifying what needs to be done to achieve a given environmental protection objective.

- Desired protection objectives for significant stream reaches can be translated into performance targets for reducing runoff volume from the catchments draining into those reaches.
- For catchments upstream of chronic flooding locations, a more appropriate performance target may be to reduce peak runoff rates from large rainfall events.
- Other performance targets relating to the preservation/restoration of significant natural features, measurement of stream health, protection/improvement of water quality, or in-stream enhancements can also be established.

In conclusion, a key principle is to establish performance targets that relate directly to the watershed objectives.

Modeling Alternative Scenarios:

Scenario modeling is used to assess a range of performance targets, and evaluate options for achieving these targets. Furthermore, scenario modeling involves consideration of the complete spectrum of rainfall events that typically occur in a year. The Guidebook states that (reference page 9-14):

"The balance between the above three components depends on the watershed objectives.

- Stream protection/restoration objectives would likely govern scenarios that emphasize source control (e.g. infiltration, rainwater re-use), along with other possible options, such as riparian corridor protection.
- Flood management objectives would likely govern scenarios that place more emphasis on detention and conveyance.

The key is to determine which scenario or blend of scenarios has the best 'fit' to address a range of watershed objectives.

A key aspect of scenario development will be to consider what can be done at the site level to retain the small events, given constraints such as soil conditions, hydrogeology, topography and land use. Further data collection may be required to assess the feasibility of achieving performance targets."

Convening for Action in Metro Vancouver

Living Water Smart and Making Green Choices to Create Liveable Communities and Protect Stream Health

City of Surrey hosts Water Balance Model Forum on March 12, 2009

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #1 posted February 2009

Convening for Action

How do we simultaneously work together as staff within a municipality and as a region AND externally with developers and other private sector players, to ensure we implement sustainable approaches to development?

The foregoing problem statement provides a frame-of-reference that will guide the discussion at the **Metro Vancouver Water Balance Model Forum** on March 12, 2009. Hosted by the City of Surrey, this 'by invitation' learning event is co-sponsored by the **Water Balance Model Inter-Governmental Partnership** and the **Green Infrastructure Partnership**. The Forum can inform deliberations vis-à-vis improving the Built Environment and protecting the Natural Environment in the Metro Vancouver region.

According to **Raymond Fung**, Chair of the Green Infrastructure Partnership: "It will be an exciting

day: regional leaders will report out on approaches and tools for doing business differently; participants will be challenged to 'think outside the pipe' in town hall sharing sessions; they can network with practitioners from other municipalities; and they can learn from each other's experiences."

"The Metro Vancouver Forum is designed to achieve multiple objectives pursuant to the policy framework outlined by the Province in **Living Water Smart**," adds **Ted van der Gulik**, Chair of

the Water Balance Model Partnership. "Also, the Forum will focus on the legal and policy tools and processes that have been both hindrances to green infrastructure implementation, and those that have assisted… or would assist… going forward."

"The best laid plans…."

The problem is the gap between design and build

How to ensure that the best laid plans come to fruition?

How to get all the actors singing from the same song sheet?

Program Overview

The Forum is organized as two stand-alone yet connected parts to achieve two sets of learning outcomes: the morning session will focus on HOW green infrastructure is being implemented in the City of Surrey; and the afternoon session will focus on HOW the **Water Balance Model** supports a regional team approach to doing business differently. Those who attend will:

- Learn about the City of Surrey's expectations for getting green infrastructure plans built.
- Understand that inter-departmental alignment is essential to being effective in implementing green infrastructure.
- Increase their understanding of what Living Water Smart means for BC.
- Learn about opportunities for applying law and policy tools to effect change on the ground.
- Explore ways they can apply the Water Balance Model to implement green infrastructure solutions.

"The City of Surrey experience and their lessons learned in championing changes in green infrastructure policies and practices will ensure the Forum has relevancy," concludes **Raymond Fung**.

Living Water Smart & Making Green Choices to Create Liveable Communities & Protect Stream Health

- Green Infrastructure in the City of Surrey: "Getting it built right"
- Alignment of Regional Actions with Provincial Goals and Objectives

Organized under the umbrella of the Water Sustainability Action Plan for British Columbia
By the Water Balance Model Inter-Governmental Partnership
In collaboration with the City of Surrey and Green Infrastructure Partnership

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #1 posted February 2009

Green Infrastructure in the City of Surrey

Drawing on experience gained and lessons learned over the past decade, the City will conduct an inter-departmental sharing session on this theme: **"Green Infrastructure – getting it built right"**.

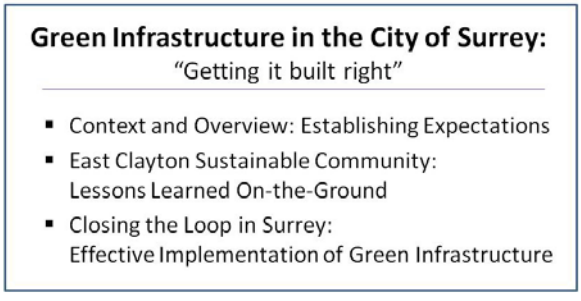
"This discussion will serve two objectives: establish the City's expectations; and, align efforts with the development community to meet the City's expectations in doing business differently," states **Remi Dubé**, Drainage Planning Manager with the City of Surrey.

"The City wishes to achieve specific outcomes in the morning; and anticipates a lively exchange of perspectives by designers, developers and regulators. This exchange will provide a reality-check that informs the discussion in the afternoon about regional alignment with provincial goals."

Program Content – Morning Session

The morning session is organized in three parts explains Remi Dubé: "First, we will describe the evolution of drainage planning in Surrey. We will also introduce the key neighbourhoods that embody the Surrey sustainability vision."

"After that, we will reflect on the lessons learned on the ground in the East Clayton Sustainable Community. Finally, we will share and reflect on the Grandview Heights and East Newton experiences."



2004 Design with Nature Forum

In May 2004, the City of Surrey hosted a Water Balance Model Forum that was designed to help stakeholders understand what 'thinking outside the pipe' and 'designing with nature' actually meant in the context of 'sustainable subdivisions' that were then newly built in Surrey, Chilliwack and elsewhere in BC.

"Five years later, we have the opportunity to look back and measure our progress in doing business differently," notes Remi Dubé.

The 2004 Forum was part of the **Outreach & Continuing Education Program (OCEP)** as implemented by the Inter-Governmental Partnership within the first year of launching the Water Balance Model.

Organized under the umbrella of the Water Sustainability Action Plan for British Columbia
By the Water Balance Model Inter-Governmental Partnership
In collaboration with the City of Surrey and Green Infrastructure Partnership

Alignment with Provincial Goals

The Province's **Living Water Smart** and **Green Communities** initiatives provide an umbrella for the Forum. Released in June 2008, Living Water Smart encourages local governments to do business differently, prepare communities for change, and choose to be water smart. By 2012, the Province's expectation is that:

- "*All land and water managers will know what makes a stream healthy, and therefore be able to help land and water users factor in new approaches to securing stream health and the full range of stream benefits.*" (page 43)

Further to the above, the Forum will address this question: **So, what does this policy statement mean to those involved in land development or redevelopment?**

Doing Business Differently

According to **Lynn Kriwoken**, **Director,** Innovation and Planning in the Water Stewardship Division of the Ministry of Environment, "This statement is the lynch-pin of Living Water Smart." Lynn Kriwoken is the Province's lead person for delivery of the Living Water Smart program, and is a member of the Forum faculty.

B.C.'s Plan to protect and preserve water resources through planning, regulatory change, education, and incentives such as economic instruments and rewards.

Water Sustainability Action Plan

Contributing to Living Water Smart is the Water Sustainability Action Plan for British Columbia, a partnership umbrella for action on the ground. It promotes a 'design with nature' approach to land development.

The Water Sustainability Action Plan comprises inter-connected program elements that give local governments and practitioners the tools and experience to better manage land and water resources. One such tool is the **Water Balance Model powered by QUALHYMO**.

Climate Change Adaptation

The 'design with nature' paradigm captures the essence of climate change adaptation. "Adaptation is about responding to the changes that will inevitably occur. Adaptation is at the community level and is therefore about collaboration. If we can show how to get the water part right, then other parts are more likely to follow," adds **Lynn Kriwoken**.

Convening for Action in Metro Vancouver

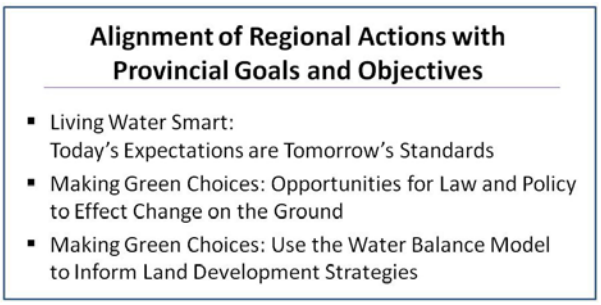
City of Surrey hosts Water Balance Model Forum

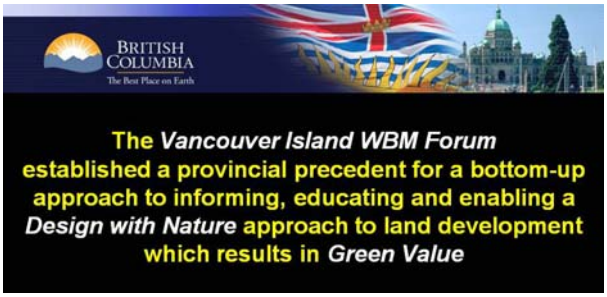
Water Bucket Web Story #1 posted February 2009

Program Content – Afternoon Session

The afternoon session is also organized in three parts explains **Ted van der Gulik**. "First, we will elaborate on the over-arching provincial policy framework and explain why today's expectations are tomorrow's standards. Then Susan Rutherford will lead a town hall discussion on a regional team approach to municipal rainwater / stormwater management."

"We will conclude with an online demonstration and town hall discussion that explores Water Balance Model applications to set performance targets for green infrastructure."





Regional Team Approach

The Metro Vancouver Water Balance Model Forum is the first step in building a regional team approach so that there will be consistent messaging regarding on-the-ground expectations for rainwater management and green infrastructure. "We are adapting the experience gained and the lessons learned from the Vancouver Island pilot program," states **Raymond Fung**.

Vancouver Island Experience

"The **2008 Vancouver Island Learning Lunch Seminar Series** comprised two sets of three seminars each. Participating local governments represented some 250,000 people," reports **Kim Stephens**, seminar team leader and Program Coordinator for the Water Sustainability Action Plan. "One of a number of outcomes was the **Vancouver Island Water Balance Model Forum**, hosted by the Cowichan Valley Regional District."

"What became clear very quickly about the value of the Learning Lunch Seminar Series is that it helped local government representatives conceptualize why a consistent approach to rainwater management is needed and what it means regionally."

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #1 posted February 2009

Metro Vancouver Application

The Vancouver Island series was organized under the umbrella of the Water Sustainability Action Plan by **CAVI – Convening for Action on Vancouver Island**, and in collaboration with the Green Infrastructure Partnership and the Water Balance Model Partnership.

"Our aim is to implement a similar program in Metro Vancouver through collaboration with SILG, the **Stormwater Interagency Liaison Group**, as part of the implementation program for Metro Vancouver's updated Liquid Waste Management Plan," adds **Raymond Fung**.

"Our vision is to generate excitement so that the Surrey Forum will serve as a catalyst for a series of follow-on learning events in the Metro Vancouver region that municipalities would undertake in collaboration with the Water Balance Model Partnership and Green Infrastructure Partnership," concludes **Ted van der Gulik**.

What is the Water Balance Model?

The new **'Water Balance Model powered by QUALHYMO'** is unique, bridges engineering and planning, links development sites to the stream and watershed, and enables local governments to establish science-based runoff performance targets.

The new Water Balance Model underpins **Beyond the Guidebook: The New Business As Usual**. To learn more, read the article in the April 2008 issue of the **Runoff** e-newsletter and titled *Create Liveable Communities and Protect Stream Health: Water Balance Model powered by QUALHYMO integrates the site with the watershed and the stream*.

The New Business As Usual

"We are using the slogan **The New Business As Usual** to convey the message that, for change to really occur, practices that until now have been viewed as the exception must become the norm moving forward. We have to build regulatory models and develop models of practice and expertise to support *The New Business As Usual*," stated **Dale Wall**, **Deputy Minister** when he announced the change-over to the new Water Balance Model at the Gaining Ground Summit in May 2008.

Convening for Action in Metro Vancouver

Making Green Choices: Opportunities for Law and Policy to Effect Change on the Ground

City of Surrey hosts Water Balance Model Forum on March 12, 2009

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #2 posted February 2009

1. Convening for Action in Metro Vancouver

How do we simultaneously work together as staff within a municipality and as a region AND externally with developers and other private sector players, to ensure we implement sustainable approaches to development?

The foregoing challenge provides context for advancing a 'regional team approach' at the **Metro Vancouver Water Balance Model Forum** on March 12, 2009. Hosted by the City of Surrey, this learning event is co-sponsored by the **Water Balance Model Inter-Governmental Partnership** and the **Green Infrastructure Partnership**.

***Cross-Region Sharing*:**

"The Forum is part of the implementation program for **Convening for Action in British Columbia**, reports **Ted van der Gulik**, Chair of the Water Balance Model Partnership. "**Collaboration, innovation**, **integration** and **partnerships** are helping local governments in three regions (Metro Vancouver, the Okanagan and Vancouver Island) make the best choices for sustainable, healthy and vibrant communities."

"Experience gained in one region can be adapted to suit the needs of the other regions. Cross-fertilization between regions creates the opportunity to continually build on the experience of others and take turns leapfrogging ahead."

2. Forum Program – An Overview

The Forum program is built around the *HOW question* as it pertains to green infrastructure: HOW will the City of Surrey get it built right; HOW will a consistent regional approach be achieved in Metro Vancouver? The morning and afternoon parts of the program each comprise three modules.

Living Water Smart & Making Green Choices to Create Liveable Communities & Protect Stream Health

- *Morning Session*:
  Green Infrastructure in the City of Surrey: "Getting it built right"
- *Afternoon Session*:
  Alignment of Regional Actions with Provincial Goals and Objectives

***Water Bucket Stories*:**

Previously, Story #1 in this series of Water Bucket articles introduced what will be covered in the morning and afternoon sessions. Now, this Story #2 elaborates on Module #5: **Making Green Choices: Opportunities for Law and Policy to Effect Change on the Ground.**

Module #5 is the bridge from the morning to the afternoon. The Forum focus is on legal and policy tools that will assist green infrastructure implementation.

"The best laid plans…."

The problem is the gap between design and build
How to ensure that the best laid plans come to fruition?
How to get all the actors singing from the same song sheet?

Organized under the umbrella of the Water Sustainability Action Plan for British Columbia
By the Water Balance Model Inter-Governmental Partnership
In collaboration with the City of Surrey and Green Infrastructure Partnership

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #2 posted February 2009

Shared Responsibilities

"The Forum is designed to start a dialogue between policy-makers and project implementers," states **Vincent Lalonde**, the City's General Manager, Engineering. "We are approaching the program design from a *shared responsibility perspective*; we will explore how policy and legal tools can help developers, regulators and designers collaborate to ensure responsible outcomes."

"The morning session will focus on the nuts-and-bolts of Surrey green infrastructure projects. The insights gained and lessons learned from Surrey's implementation experience will inform what we do in the afternoon," continues **Ray Fung**, Chair of the Green Infrastructure Partnership. "The morning and afternoon program content will be seamlessly integrated."

***Making Green Choices*:**

"In particular, implementation issues raised in the morning session will be addressed in the afternoon module about **Making Green Choices: Opportunities for Law and Policy to Effect Change on the Ground**," adds **Ted van der Gulik**. "This town hall sharing session will be led by Susan Rutherford, who represents West Coast Environmental Law on the Green Infrastructure Partnership Steering Committee."

"Everyone will benefit from attending both the morning and afternoon sessions," concludes **Vincent Lalonde**. "The policy people will have an appreciation for what is involved in constructing green infrastructure; and the implementers will understand what the provincial, regional and local goals are….and what we are trying to achieve through the use of policy and legal tools."

3. Responsibility Framework

The Surrey Forum is a first step in advancing a regional team approach to rainwater management and green infrastructure that will align local actions with provincial goals as stated in **Living Water Smart, BC's Water Plan**.

B.C.'s Plan to protect and preserve water resources through planning, regulatory change, education, and incentives such as economic instruments and rewards.

Creating Our Future

According to **Kim Stephens**, Forum team leader and Program Coordinator for the **Water Sustainability Action Plan for British Columbia**, "Living Water Smart provides a framework and sets a direction. The purpose in convening for action is to establish consistent expectations on-the-ground: *This is what we want to achieve, and this is how we will get there*."

"Our immediate objective in convening for action is to encourage 'green choices' that will ripple through time, and will be cumulative in creating liveable communities and protecting stream health. We are NOT saying that every community must follow the same formula; what we are saying is that everyone needs to agree on expectations and how all the players….regulators, developers, designers, etc….will work together, and after that each community can reach its goals in its own way."

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Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #2 posted February 2009

What Tools Work?

"The Surrey Forum is an opportunity for Metro Vancouver participants to explore the *responsibility theme*," states **Susan Rutherford**. "The program design for the Surrey Forum incorporates experience gained through successful team-building on Vancouver Island."

"Each party in the process has a responsibility. So, we envision a discussion of the respective responsibilities involved in implementing a vision, as well as a discussion of what your experience has to tell us about which tool - legal, policy or otherwise – is appropriate for holding each party accountable. In this way, we hope to learn what works well and what could work better."

"What tools work in which context? What are the legal tools and what are the challenges, and which legal tool makes the most sense for getting the job done?"

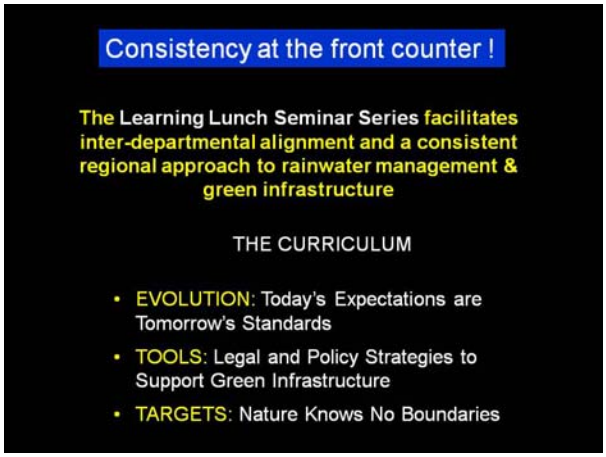
"What do you want to say to each other – the other parties in this joint endeavour of community development - about who has 'dropped the ball' in what process. What is (not) working?"

"Have you turned your mind to how this might work more effectively to achieve results? What bylaws, policies, procedures or other tools can you imagine would make this work better?"

Vancouver Island Pilot Region

Vancouver Island is the pilot region for a collaborative and inclusive approach to informing and educating local governments and the private sector.

"The Vancouver Island pilot has helped partner local governments conceptualize why a consistent approach to rainwater management and green infrastructure is needed and what it means regionally," reports **Kim Stephens**. "Furthermore, the pilot program has provided the springboard for shared responsibility and bottom-up regional action to ***communicate, cooperate, collaborate and coordinate***."



"The curriculum for the pilot program is based on a number of currently available guidance documents and/or tools, in particular **Beyond the Guidebook: Context for Rainwater Management and Green Infrastructure in British Columbia**."

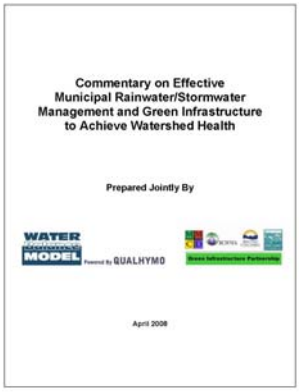
Beyond the Guidebook builds on the science-based foundation provided by **Stormwater Planning: A Guidebook for British Columbia**, published in 2002, and incorporates lessons learned over the past six years in moving from planning to action.

Organized under the umbrella of the Water Sustainability Action Plan for British Columbia
By the Water Balance Model Inter-Governmental Partnership
In collaboration with the City of Surrey and Green Infrastructure Partnership

4. Opportunities for Law and Policy to Effect Change on the Ground

In Module #5 in the afternoon, **Susan Rutherford** will first introduce the *Green Infrastructure Guide*, published by West Coast in 2007. Then she will present the **Commentary on Effective Municipal Rainwater/Stormwater Management** in order to set the context for the town hall sharing session.

"The Commentary is a 2-page synopsis that the Green Infrastructure Partnership prepared for Metro Vancouver; it is now being used provincially," explains Susan Rutherford. "The Commentary identifies actions that can be taken at three scales – regional, local and private – to create liveable communities and protect stream health."


Commentary on Effective Municipal Rainwater/Stormwater Management and Green Infrastructure to Achieve Watershed Health

Prepared Jointly By

WATER BALANCE MODEL Powered by GUALHYMO

April 2008

"In British Columbia, the **Local Government Act** vests the responsibility for drainage with municipalities, and British Columbia case law makes clear the responsibility of municipalities to manage runoff volume to prevent downstream impacts. An increasingly important corollary to that responsibility is the need to work from the regional down to the site scale, to maintain and advance watershed health to ensure that both water quantity and quality will be sustained to meet both ecosystem and human health needs."

Responsibility Matrix

"Looking ahead to March 12, we are in the process of framing a **Responsibility Matrix** that regulators, developers and designers will be able to use as a decision support tool," states Susan Rutherford.

"For the first part of the matrix, think in terms of three columns: GOAL, PARTY and TOOL. Our focus is on the linkages – that is, how people interact and/or collaborate to achieve community development sustainability goals."

Goal	Party	Tool
– Objectives – Situations – Responsibilities	– Regional Staff or Politicians – Municipal Staff or Politicians – Private Actors	– Law – Bylaw – Policy – Procedure – Incentive – Penalty – Security

"For the second part of the matrix, again think in terms of three columns that elaborate on the first part: RESPONSIBILITY, RESPONSIBLE PARTY and TOOL. Under responsibility, we will be defining a series of objectives and/or situations – for example, ensuring that the minimum topsoil requirement is achieved and maintained over time."

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #2 posted February 2009

Imagine….

"The Forum is an opportunity for people with different perspectives to talk candidly to each other about green infrastructure implementation. We want participants to feel comfortable to state what is on their minds," continues **Susan Rutherford**.

"If someone says something is not working, then the challenge for them is: *Okay, what would make it work, and what are you going to do?* "We see the Forum as providing an opportunity to generate some positive energy to overcome barriers. Our theme is 'imagine'."

"What we have in mind when we say 'imagine' is that Forum participants would imagine a legal tool or procedure that would ensure that barriers are removed or other parties in the process more effectively fulfil their piece of the sustainable development puzzle."

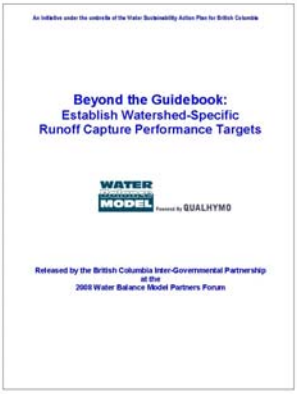
"Imagine what we could each do differently – for example, consider how the City of Courtenay imagined that things would be better if they could get their inspectors on-board with inspecting for topsoil and/or other green infrastructure features".

"What we'd like the town hall sharing session to draw out is that there are solutions to be found, if the different parties /departments /local governments and regions simply talk to each other about how they could all work together more effectively, using law reform or other process changes as tools," states Susan Rutherford in summary.

"Once we know what we want our watersheds and neighbourhoods to look like, the next step is to decide *what the tools are that will get us there,"* concludes **Vincent Lalonde**. "All of us ….whether we are regulators, developers or designers ….need to understand and care about the goal if we are to create the future that we all want."

Performance Targets

Accompanying the Commentary on *Effective Municipal Rainwater/Stromwater Management* is a paper titled **Beyond the Guidebook: Establish Watershed-Specific Runoff Capture Performance Targets** that was released at the 2008 Water Balance Model Partners Forum.



"The law and policy module will close by focusing our discussion of roles, responsibilities and tools on how performance targets for a region might be both arrived at, and achieved," comments **Susan Rutherford**. "What are our respective roles and responsibilities for getting there? What tools can we use to ensure that we are aligned and effective in the work that we do?"

Applying the Water Balance Model:

"This introductory discussion will set the scene for Module #6," adds **Ted van der Gulik**. "The module theme is **Making Green Choices: Use the Water Balance Model to Inform Land Development Strategies**." On February 5, the Water Balance Model received a *Premier's Award for Innovation and Excellence*.

"On the matter of the Living Water Smart initiative, I came away from our conversation with a strong conviction that the Premier means what he says, and says what he means about the province-wide importance of implementing BC's Water Plan."

Organized under the umbrella of the Water Sustainability Action Plan for British Columbia
By the Water Balance Model Inter-Governmental Partnership
In collaboration with the City of Surrey and Green Infrastructure Partnership

5. What is a Regional Team Approach?

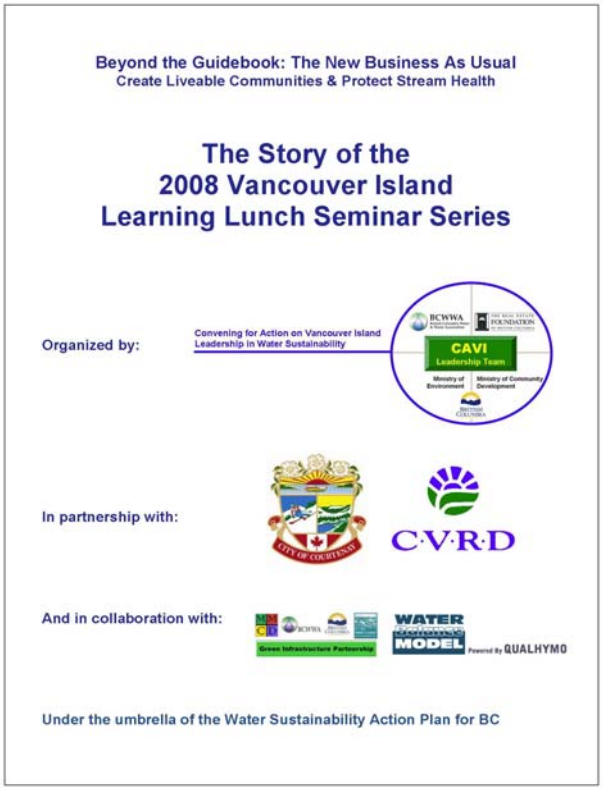
Vancouver Island is the pilot region for a precedent-setting approach to regional team-building. "Through programs such as the **Vancouver Island Learning Lunch Seminar Series**, we are informing and educating those who influence or impact how land is developed and water is used," reports **Kim Stephens**.

Partnerships and Collaboration

"A regional team approach is founded on broad and inclusive partnerships and collaboration that reach for the common goal of sustainability. In short, we have set our sights on the *common good* and challenge the old barriers of jurisdictional interests. To achieve the *common good*, this requires bringing together:

- ✓ **Local government** - those who plan and regulate land use;
- ✓ **Developers** - those who build;
- ✓ **The Province** - those who provide the legislative framework;
- ✓ **Universities and colleges** - those who provide research; and
- ✓ **The stewardship sector** – those who advocate conservation of resources."

"To get to the big picture, it starts with the smallest pieces. Hence, the Convening for Action team is advancing a regional team approach that aligns local actions with provincial policy goals, in particular those defined in the **Living Water Smart** guidance document," concludes Kim Stephens.



Water Bucket Web Story #2 posted February 2009

imagine our neighbourhoods

Are connected by streams and wetlands—giving us green corridors to walk in and use to get to the grocery store

Have trees and shrubs along stream banks that cool our communities and capture greenhouse gases

Have plentiful trees to catch the rain and snow, so water seeps slowly into the ground instead of rushing straight into storm drains and creeks

Have fish in the creeks that our kids can catch and eat

Have sidewalks and roads that allow water to flow into the ground—replenishing our supply

Are filled with native plants that aren't so thirsty

35

- reproduced from **Living Water Smart**, page 25

Convening for Action in Metro Vancouver

Green Infrastructure in the City of Surrey: "Getting it built right"

City of Surrey hosts Water Balance Model Forum on March 12, 2009

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #3 posted February 2009

Convening for Action in the Metro Vancouver Region

How do we simultaneously work together as staff within a municipality and as a region AND externally with developers and other private sector players, to ensure we implement sustainable approaches to development?

The foregoing challenge provides context for advancing a 'regional team approach' at the **Metro Vancouver Water Balance Model Forum** on March 12, 2009. Hosted by the City of Surrey, this learning event is co-sponsored by the **Water Balance Model Inter-Governmental Partnership** and the **Green Infrastructure Partnership**.

1. Regional Team Approach

The Surrey Forum is a first step in advancing a regional team approach to rainwater management and green infrastructure that will align local actions in Metro Vancouver with provincial goals as stated in **Living Water Smart, BC's Water Plan**. "We are adapting the experience gained and the lessons learned from the Vancouver Island pilot program," states **Raymond Fung**, **Chair** of the Green Infrastructure Partnership.

B.C.'s Plan to protect and preserve water resources through planning, regulatory change, education, and incentives such as economic instruments and rewards.

Vancouver Island Pilot Region:

At the **2008 Vancouver Island Learning Lunch Seminar Series** hosted by the City of Courtenay,

Margaret (Maggie) Henigman of the Ministry of Environment's Nanaimo regional office provided this perspective during a town hall sharing session: "Since 1996 I have been working across Vancouver Island, both reviewing development proposals and monitoring project implementation. In the last couple of years I have been really pleased to see a huge shift take place in the way projects are being done."

"As I reflect on the current Vancouver Island situation, it strikes me that we have created a new social norm; and it is being accepted by the development community as a whole. The change in attitude is really gaining momentum. Everywhere I go I am seeing evidence of the new ethic. It is not that everyone is perfect, but the change is really coming along."

Organized under the umbrella of the Water Sustainability Action Plan for British Columbia
By the Water Balance Model Inter-Governmental Partnership
In collaboration with the City of Surrey and Green Infrastructure Partnership

2. Why Surrey is a Leader

"On the matter of implementing on-site rainfall capture, there is a fundamental difference between Surrey and other Metro Vancouver municipalities," states **Remi Dubé**, **Drainage Planning Manager** with the City of Surrey. "Surrey has moved beyond pilot projects; we are moving to a broader watershed objectives approach to capturing rain where it falls to better protect our streams."

Water Bucket Stories:

This is the third in a series of stories leading up to the Forum. Their purpose is to progressively connect the dots and establish expectations. Previously:

- Story #1 titled **Living Water Smart and Making Green Choices to Create Liveable Communities and Protect Stream Health** introduced what will be covered in the morning and afternoon sessions.
- Story #2 titled **Making Green Choices: Opportunities for Law and Policy to Effect Change on the Ground** introduced the shared responsibility theme, and is the bridge from the morning to the afternoon.

This Story #3 elaborates on the learning outcomes for the Forum morning session. Readers are encouraged to download copies of all three.

The Story of the Surrey Water Balance Model Forum

3. Forum Program – An Overview

The Forum program is built around the *HOW question* as it pertains to green infrastructure: HOW will the City of Surrey ensure it gets built right; HOW will a consistent regional approach be achieved in Metro Vancouver? The morning and afternoon parts of the program each comprise three modules.

"Everyone will benefit from attending both the morning and afternoon sessions," states **Vincent Lalonde, the City's General Manager, Engineering**. "The policy people will have an appreciation for what is involved in constructing green infrastructure; and the implementers will understand what the provincial, regional and local goals are….and what we are trying to achieve in Surrey through the use of policy, approved standards and legal tools."

4. Green Infrastructure in the City of Surrey

The morning session will focus on the nuts-and-bolts of Surrey green infrastructure projects. "First, we will describe the evolution of drainage planning in Surrey (Module 1). We will also introduce the key neighbourhoods that embody the Surrey sustainability vision," explains **Remi Dubé**.

"After that, we will reflect on the lessons learned on the ground in the East Clayton Sustainable Community (Module 2). Finally, we will share and reflect on the Grandview Heights and South Newton experiences (Module 3)."

Green Infrastructure in the City of Surrey:
"Getting it built right"

1. Context and Overview: Establishing Expectations
2. East Clayton Sustainable Community: Lessons Learned On-the-Ground
3. Effective Implementation of Green Infrastructure: Making it Work in Surrey

Opportunities for Law and Policy to Effect Change on the Ground

"Module 3 will be conducted as a town hall sharing session about the design and construction aspects of green infrastructure implementation. This will set the stage for Module 5 in the afternoon when we will explore how policy and legal tools can help regulators, developers and designers collaborate to ensure responsible outcomes," adds **Vincent Lalonde**.

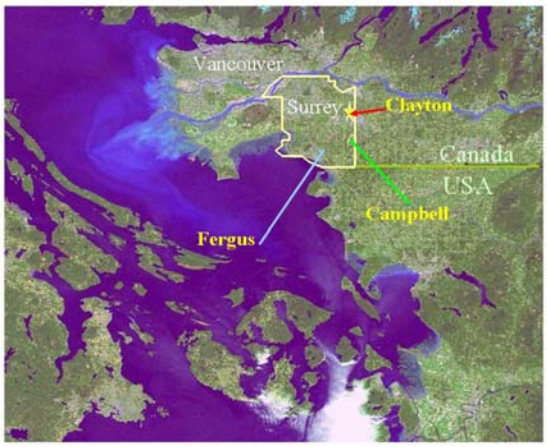
"What we'd like the town hall sharing session in Module 5 to draw out is that there are solutions to be found, if the different parties/ departments/ local governments and regions simply talk to each other about how they could all work together more effectively, using law reform or other process changes as tools," states **Susan Rutherford**, who represents West Coast Environmental Law on the Green Infrastructure Partnership Steering Committee.

Building on a Decade of Experience

"Looking back, it is sometimes hard to believe that more than a decade has passed since the City initiated the East Clayton plan", reflects **Paul Ham, Past-Chair** of the Green Infrastructure Partnership and retired General Manager, City of Surrey Engineering. "With the passage of time, we tend to take the early innovation for granted."

"Three provincial initiatives had an early influence on City of Surrey thinking. These were the **UniverCity Sustainable Community** on Burnaby Mountain, the **Provincial Guidebook** for stormwater planning, and the experience of the City of Chilliwack when it developed its **Manual for Surface Water Management** as a feedback loop for Guidebook development."

"The early results from East Clayton combined with the on-the-ground experience of Chilliwack gave Surrey the confidence to implement new Low Impact Development (LID) objectives in two plans – the Campbell Heights Economic Development Plan (1999-2000), and the Highway 99 Corridor Land Use Plan (2002). In fact, Council made the use of LID practices a condition of both plans", explains Ham.



5. On-Site Rainwater Management Applied City-Wide

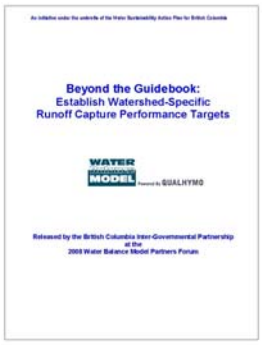
In 2008, Surrey Council endorsed By-Law No. 16610 (Surrey Stormwater Drainage Regulation and Charges). Part 5 is titled **ON-SITE STORMWATER MANAGEMENT REQUIREMENTS.** Clause 9 in Part 5 specifies that:

- Newly created *parcels* shall be constructed with *on-site stormwater management facilities* when these are prescribed through Council approved neighbourhood plans, master drainage plans, integrated stormwater management plans or as required in a *Servicing Agreement* or specific *service connection*.

"On March 12, we will explain why and how this By-Law is the tool that enables the City to establish watershed-specific performance targets for rainwater runoff volume and rate reduction at the development site scale," notes **Remi Dubé**. "Now we can determine what makes sense, meets multiple objectives, and results in net environmental benefits at a watershed scale."

Performance Targets

Module 5 in the afternoon will introduce and provide a policy/legal context for **Beyond the Guidebook: Establish Watershed-Specific Runoff Capture Performance Targets.** This guidance document was released at the 2008 Water Balance Model Partners Forum.



"The law and policy module will close by focusing our discussion of roles, responsibilities and tools on how performance targets for a region might be both arrived at, and achieved," foreshadows **Susan Rutherford**. "What are our respective roles and responsibilities for getting there? What tools can we use to ensure that we are aligned and effective in the work that we do?"

From Stormwater Management to RAINwater Management

On March 12, the discussion of performance targets will segue into Module 6: **Making Green Choices: Use the Water Balance Model to Inform Land Development Strategies**. This will be the subject of Story #4 in this series.

"Choice of words is important; hence, changing the technical language is part of the process of advancing green infrastructure practices. We are weaning drainage practitioners away from a single-objective stormwater management way of thinking and designing.... to a way of doing business that is holistic, namely RAINwater management," states **Kim Stephens**, Forum team leader and Program Coordinator for the **Water Sustainability Action Plan for British Columbia**.

"Increasingly, we have observed that the term **RAINwater management** resonates with non-engineers and the community at large. They intuitively get it. RAINwater management is about integration and an interdisciplinary approach that is landscape-based, and therefore goes well beyond the narrow engineering definition for conventional **stormwater** management."

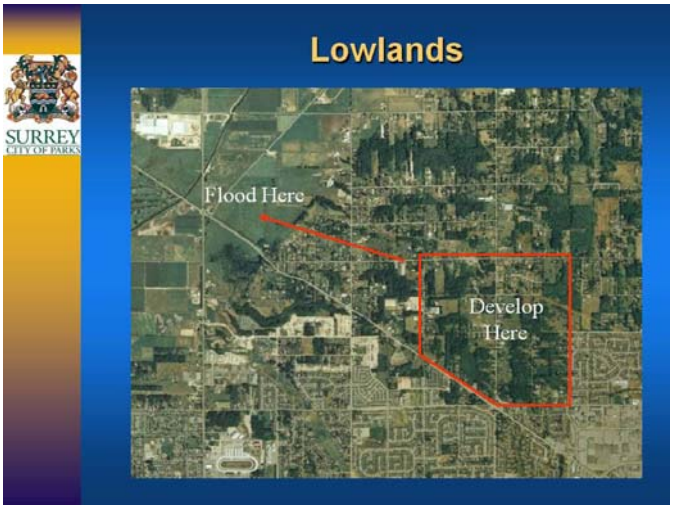
6. East Clayton Sustainable Community: Lessons Learned

According to **Remi Dubé**, "In Module 2, we have three objectives or learning outcomes in featuring East Clayton: provide the sustainability context; review the implementation experience for private and public rainfall capture systems; and reflect on lessons learned."

The Neighbourhood Plan

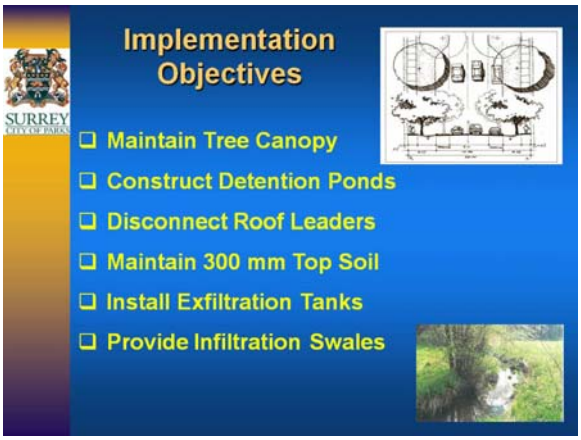
The 250-hectare neighbourhood of East Clayton in Surrey was designated as 'urban' in 1996, setting the stage for an unprecedented new neighbourhood plan to increase residential density, promote social cohesion and maximize affordability and walkability.

Different housing zones were created, each with guidelines on lot configurations, including widths and setbacks, allowing developers to choose the housing mix. A 'special residential' category was included that allows small-scale businesses to be combined with residential units. Sixty per cent of the lots were to have rear lane access for cars, which allows property owners to build secondary units at the rear.



Good Intentions

"A decade ago, the driver for innovation was the need to protect the downstream agricultural lowlands from flooding that would otherwise have resulted from the increase in annual rainwater runoff as the formerly rural East Clayton was converted to intensively urbanized residential development," observes **Remi Dubé**.



"To provide the complete picture, we are approaching the story of East Clayton in two parts. First, **Jim Dumont** and **David Hislop** will describe what we intended to build and what the models show. In part two, **Monty Hurd, the City's Manager of Engineering Inspections**, will elaborate on what was actually built and where we ran into implementation challenges."

"Jim Dumont and David Hislop will describe what we intended to build and what the models show."

Expectation

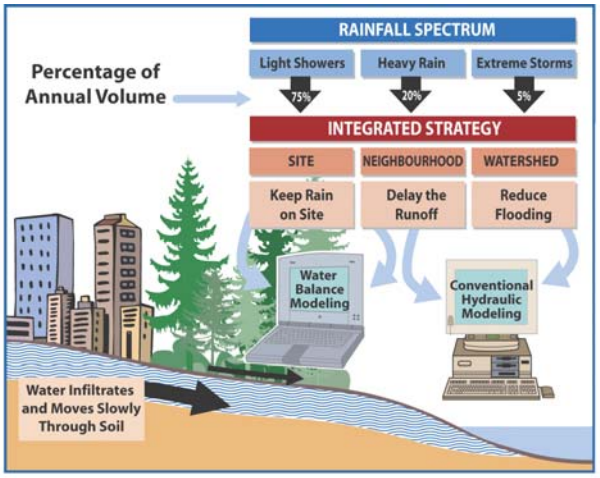
"We are anticipating that Monty's part could be quite powerful in stimulating a sharing of experience. We hope that land development consultants in particular will tell their stories... because we will be getting into construction timing issues, in particular what happens to the topsoil and swales once the builders commence house construction," states **Remi Dubé**.

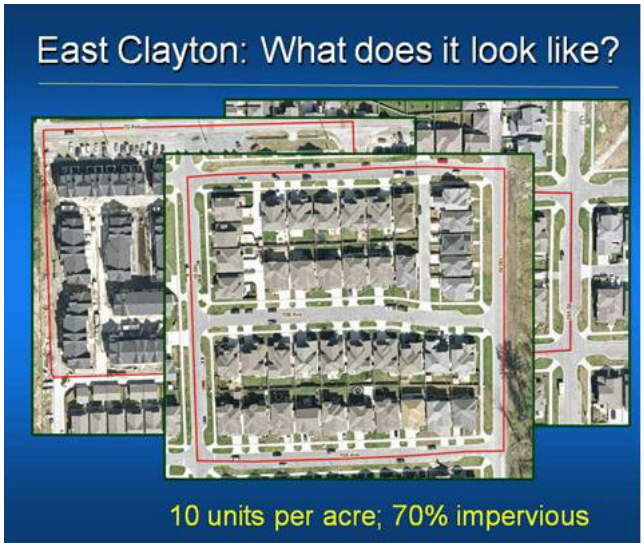
"The City and others certainly learned a lot from the East Clayton experience; and we have applied the lessons learned and adapted our approach in order to do business differently in Campbell Heights, Grandview Heights, South Newton, etc,"

"In addition to design and construction issues, the City also learned some lessons from a site development perspective. An unintended consequence was the higher than expected percentage of *hardscape*. With a different approach to built-form, we could have had both higher density and substantially more green space." This is illustrated by the following comparison. On the left is what East Clayton looks like; on the right is what it might have been:

Water Balance Model Application

"East Clayton was one of the first test applications of the water balance methodology. The 'new' Water Balance Model incorporates the breakthrough in modelling approach that had its genesis in East Clayton," notes **Kim Stephens**." In the afternoon session on March 12, Jim Dumont will touch on this aspect when he elaborates on how the Water Balance Model can be applied to inform land development strategies."



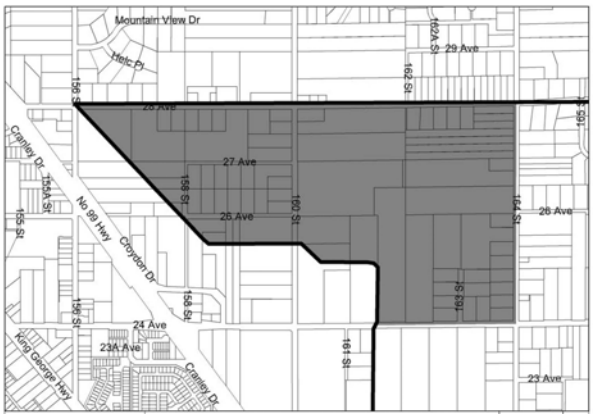


7. Effective Implementation of Green Infrastructure: Making it Work in Surrey

Half the morning session will be devoted to Module 3. "After the coffee break, we will be introducing a selection of innovative measures that are being implemented City-wide for rainfall capture," states **Remi Dubé**. "Then the Grandview Heights and South Newton case studies will provide the basis for a town hall discussion."

"The town hall discussion will serve two objectives: first, establish the City's expectations; and, secondly align efforts with the development community to meet the City's expectations in doing business differently. We are looking forward to a lively exchange of perspectives by designers, developers and regulators."

"**Sam Lau**, the City's Manager of Land Development Services, will be the moderator for the town hall discussion. His group's role is to be the bridge between the development community and the City's engineering and planning departments. Having Sam's group as a bridge helps us be clear regarding our objectives."



Grandview Heights

"On March 12, we will be showcasing the Morgan Heights development because it exemplifies what we mean by *shared responsibility*. We have asked **Ken Anderson**, the development project manager, to tell his story at the Forum," continues Remi Dubé.

Morgan Heights straddles about 79 hectares bounded by the Highway 99 corridor to the west, 28th Avenue to the north, 24th Avenue to the south, and 164th Street to the east. Morgan Heights is a planned community of 5400 people.

From Start to Finish:

"Ken provides a great perspective because his approach to development is to be involved from start to finish, really! He was part of the Neighbourhood Community Plan process; and he will be there when the last houses are built."

"Ken truly has the big picture; this includes the City's objectives, and the issues of community concern such as downstream drainage impacts. Ken is also intimately involved in the details, in particular ensuring that on-site rainfall capture systems are built properly."

Making it Happen at the Site Scale:

"The key message about the Morgan Heights development is that Ken Anderson has taken responsibility to make rainfall capture happen on the lots that he has developed. He is holding securities for landscaping and sediment control; and that money is not released until after the houses are built."

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #3 posted February 2009

South Newton

"South Newton is a prime example of *ask a different question, get a different answer*," reflects **Remi Dubé**. "In 2006, questions had been raised regarding the staging of construction and the components of the stormwater management system as proposed in the Neighbourhood Concept Plan documents, which had been adopted in 1999 and updated in 2002."

The South Newton study area is located within the Hyland Creek watershed – a tributary to the Serpentine River – in south Central Surrey. The study area encompasses the western portions of the South Newton NCP Area and is bounded by 64th and 58th Avenues on the north and south, respectively; and by 130th and 148th Streets on the west and east, respectively.

Infiltration Strategy:

"Jim Dumont found that by utilizing innovative infiltration systems, a number of detention ponds that had been identified in the original NCP could be eliminated. In this catchment, this could result in a multi-million dollar net reduction in the City's 10-Year Capital Plan while enabling development to proceed."

"Through hydrologic and hydraulic analysis, we were able to demonstrate that distributed rainwater management infiltration systems will control runoff volumes, reduce potential stream erosion, and meet regulatory objectives," reports **Jim Dumont**, **Engineering Applications Authority** for the Inter-Governmental Partnership.

"The infiltration system sizing and system operation was optimized to reduce the future potential stream erosion, to maintain the existing flow exceedance values, and to minimize the change in the magnitude of the flood discharges to the streams."

Implementation:

"Whenever you try something different, there will be start-up challenges as developers, designers and regulators come to grips with the new way of doing business. The way we look at it, every problem is an opportunity," continues **Remi Dubé**.

"The City has learned a lot from the early stages of on-site infiltration implementation in South Newton; and the experience gained has served as a valuable feedback loop that has enabled us to adapt our approach so that we in fact achieve the rainwater/stormwater management requirements."

"Currently, building permits are not released until the on-lot infiltration systems are certified by a qualified professional engineer. This provides the City with considerable leverage to ensure compliance."

"On March 12, the morning session will mainly focus on the technical aspects of infiltration implementation. In the afternoon, **Susan Rutherford** will expand on the legal and policy aspects of getting it built right. This will also provide representatives from other municipalities with a chance to share their experiences."

"The key message for participants to take away from the Surrey Water Balance Model Forum is that the City is committed to moving forward with **The New Business As Usual**," concludes Remi Dubé**.**

8. Advancing a Regional Team Approach

"In holding the Surrey Forum, our vision is that this event will be the catalyst for additional regional forums that would be organized in collaboration with Metro Vancouver's Stormwater Interagency Liaison Group.... i.e. SILG," states **Ted van der Gulik, Chair** of the Inter-Governmental Partnership that developed and maintains the Water Balance Model.

An Historical Perspective

"British Columbia is recognized internationally as a leader in implementing a natural systems approach to rainwater management in the urban environment. In many ways, that recognition is an outcome of the trail-blazing efforts of SILG at the beginning of this decade. In fact, the Inter-Governmental Partnership itself began as a sub-group of SILG; then quickly expanded to become a provincial group with municipal representation from four regions."

Ted van der Gulik chats with **Premier Gordon Campbell** after receiving the *Premier's Award for Innovation & Excellence* for the 'new' Water Balance Model

"The efforts of SILG in championing research and innovation made it possible to develop the tools and promote the applications that helped overcome fear and doubt in Metro Vancouver, and begin doing business differently. This enabled projects such as East Clayton to get off the ground."

Showcasing Innovation

"We envision that the Surrey Forum will be a transformational event much as the **2005 REAC Consultation Workshop** hosted by the City was a catalyst for action provincially. It resulted in the highly successful **Showcasing Green Infrastructure Innovation** program on both sides of the Georgia Basin," continues **Raymond Fung, Chair** of the Green Infrastructure Partnership.

"Because success leads to success, one of our goals is to implement an educational program in Metro Vancouver that would be modelled on the **Vancouver Island Learning Lunch Series.**"

The Learning Lunch Model

"Each series in the Vancouver Island pilot provided an inter-departmental and inter-municipal learning opportunity for collaborative exploration. Each series comprised a set of three seminars. The series was conducted as a cumulative process, from philosophy to tools," adds **Kim Stephens**. "A critical success factor was building the program around on-the-ground examples and walkabouts."

"By spreading the curriculum over three sessions, it enabled participants to take in new information, reflect on it, blend it with their own experience, test it, and eventually apply it in making decisions. In terms of the actual curriculum design, it was a matter of drawing upon a number of provincial guidance documents (notably **Stormwater Planning: A Guidebook for British Columbia**) and making them interesting and relevant to a mixed audience."

Convening for Action in Metro Vancouver

Making Green Choices: Use the Water Balance Model to Inform Land Development Strategies

City of Surrey hosts Water Balance Model Forum on March 12, 2009

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #4 posted February 2009

Convening for Action in the Metro Vancouver Region

How do we simultaneously work together as staff within a municipality and as a region AND externally with developers and other private sector players, to ensure we implement sustainable approaches to development?

The foregoing challenge provides context for advancing a 'regional team approach' at the **Metro Vancouver Water Balance Model Forum** on March 12, 2009. Hosted by the City of Surrey, this learning event is co-sponsored by the **Water Balance Model Inter-Governmental Partnership** and the **Green Infrastructure Partnership**.

1. Alignment with Provincial Goals

"The Surrey Forum is designed to achieve multiple objectives in accordance with the policy framework developed by the Province in **Living Water Smart, BC's Water Plan**, states **Ted van der Gulik, Chair** of the Inter-Governmental Partnership. "In particular, we wish to explore ways that regulators and designers can apply the Water Balance Model to facilitate implementation of green infrastructure solutions that achieve two objectives: create liveable communities and protect stream health."

B.C.'s Plan to protect and preserve water resources through planning, regulatory change, education, and incentives such as economic instruments and rewards.

The Story of the Surrey Forum

"This is the fourth in a series of stories leading up to the Forum, explains **Kim Stephens**, Program Coordinator for the **Water Sustainability Action Plan for BC**. "Their purpose is to progressively connect the dots and foreshadow what participants can expect on March 12th."

"This Story #4 describes the parts that **Jim Dumont** and **Richard Boase** will play in the Water Balance Model segment of the program."

Organized under the umbrella of the Water Sustainability Action Plan for British Columbia
By the Water Balance Model Inter-Governmental Partnership
In collaboration with the City of Surrey and Green Infrastructure Partnership

2. Forum Program – An Overview

The Forum program is built around the *HOW question* as it pertains to green infrastructure: HOW will the City of Surrey ensure it gets built right; HOW will a consistent regional approach be achieved in Metro Vancouver? The morning and afternoon parts of the program each comprise three modules.

On-Site Rainwater Management

"While the morning session will be specifically about the design and construction details of on-site rainwater management and green infrastructure implementation, there will be a Water Balance Model theme weaving through the discussion," states **Remi Dubé**, **Drainage Planning Manager** with the City of Surrey.

"The three modules comprising the morning session will cover the history of drainage planning in Surrey; the early lessons learned on the ground in the East Clayton Sustainable Community; and what effective implementation of green infrastructure means in Grandview Heights, South Newton and elsewhere."

"Experience gained from these projects is reflected in the evolution of the water balance methodology. In the new Water Balance Model, the analyses for volume and flow rate reduction are fully integrated at all scales of application."

Establishing Performance Targets

"A decade of on-the-ground experience has enabled the City of Surrey to move beyond pilot projects to a broader watershed objectives approach to on-site rainfall capture," continues **Remi Dubé,** "As we move forward, the new Drainage By-Law endorsed by Council in 2008 is the tool that will enable the City to establish watershed-specific performance targets for rainwater runoff volume and rate reduction."

Applying the Water Balance Model:

"The **Commentary on Effective Municipal Rainwater/Stormwater Management**, developed by the Green Infrastructure Partnership in 2008 as part of the updating of Metro Vancouver's **Liquid Waste Management Plan**, now takes on added significance and relevance," states **Paul Ham, Past-Chair** of the Green Infrastructure Partnership. "The 2-page Commentary is succinct in providing a framework for municipal actions, and for applying the Water Balance Model."

"The morning session will be very much about the nuts-and-bolts of green infrastructure design and construction. This on-the-ground understanding is a prerequisite for an informed discussion in the afternoon about how, and what it means, to apply the Water Balance Model to establish and/or evaluate watershed-specific performance targets for rainfall capture," adds **Corino Salomi**, who represents the Department of Fisheries & Oceans on the Green Infrastructure Partnership.

"A must-read guidance document is **Beyond the Guidebook: Establish Watershed-Specific Runoff Capture Performance Targets,** released in February 2008."

3. Premier's Award for Innovation and Excellence

"The Premier's Awards are an annual opportunity to publicly recognize the extraordinary accomplishments of the men and women who have chosen public service as their career," said **Premier Gordon Campbell** on February 5, 2009 at an awards ceremony where the Water Balance Model received the *Premier's Award for Innovation and Excellence*.

The Story of the Water Balance Model

The Premier's Office has produced a 2-minute video that features Ted van der Gulik and Kim Stephens telling the story of what the tool means for British Columbia.

"The Water Balance Model is a means to an end," states **Ted van der Gulik**. "The challenge that we have been posing since 2002 is this: *What do we want this province to look like in 50 years and beyond?*"

"The Water Balance Model is a tool that will help us create our future," adds **Kim Stephens**. "To get to the big picture, it starts with the smallest pieces. The Water Balance Model links the site to the stream to the watershed."

Premier Gordon Campbell with the award-winning Water Balance Model

One-on-One with the Premier

At the conclusion of the awards ceremony, the Premier sought out Ted van der Gulik. This created an opportunity for an extended conversation.

"As we talked, it became clear to me that WATER is high on the Premier's agenda. He has a strong grasp of water-related issues and the long-term implications if we do not start doing business differently in BC. In a nutshell, he gets it."

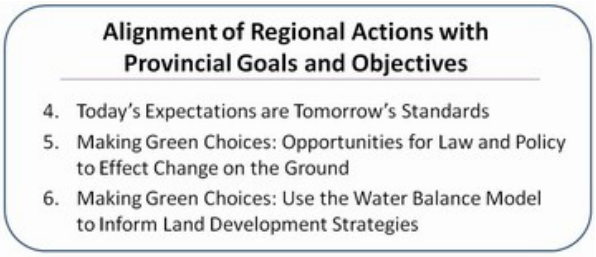
"The Premier expressed his personal commitment to making a difference because we have an obligation and a responsibility to act on behalf of our children and our grand-children so that we leave them with a legacy."

"On the matter of the **Living Water Smart** initiative, I came away from our conversation with a strong conviction that Premier Campbell means what he says, and says what he means about the province-wide importance of implementing BC's Water Plan. High-level recognition of the Water Balance Model is reassuring... because the model is a key tool underpinning Living Water Smart," concludes **Ted van der Gulik**.

"During the current climate of financial uncertainty, it becomes that much more important to stay on mission vis-à-vis rainwater management and green infrastructure solutions that protect quality of life," adds **Kim Stephens**. "In terms of the long-term vision for BC, and as the Premier emphasized in his speech from the heart, now is the time to be preparing for economic recovery that is truly based on making green choices."

4. Beyond the Guidebook: Connecting the Site to Stream Health

The afternoon part of the Forum program is organized as three modules explains **Ted van der Gulik**.



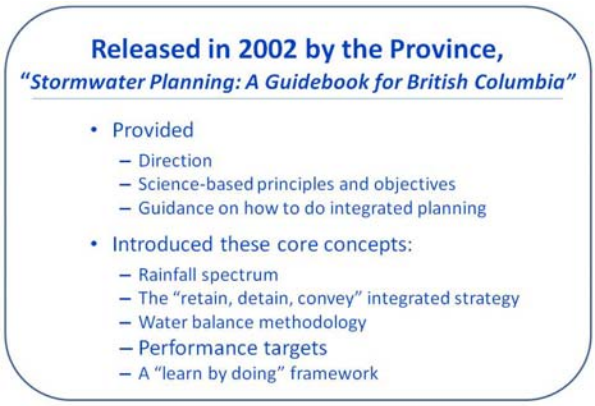
"First, we will introduce the provincial policy framework and explain why today's expectations are tomorrow's standards (Module 4). Cascading provincial, regional and local perspectives will be provided by **Lynn Kriwoken, Ray Fung** and **Vincent Lalonde**."

"Then **Susan Rutherford** will lead a town hall sharing session that will explore how regulators, developers and designers can collaborate more effectively, using policy and legal tools to implement green infrastructure solutions (Module 5)."

"Finally, Module 6 is built around a presentation by **Jim Dumont** and a poster session led by **Richard Boase.** The information they provide will, in turn, inform a town hall sharing session that explores application of the Water Balance Model to set performance targets for green infrastructure."

Beyond the Guidebook Introduced

"In 2003, the Inter-Governmental Partnership developed the web-based Water Balance Model as an extension of **Stormwater Planning: A Guidebook for British Columbia**. Now that we have expanded the decision support capabilities of the Water Balance Model by integrating it with the QUALHYMO hydrologic engine, we have adopted **Beyond the Guidebook** for branding purposes," continues **Ted van der Gulik**.



The pilot for Beyond the Guidebook is the City of Surrey Fergus Creek watershed plan. "The plan is based on implementing *green solutions* as an alternative to conventional engineered *blue solutions,"* reports **Remi Dubé**.

In February 2009, the Ministry of Community Development sent out a Circular to all Municipal and Regional District Chief Administrative Officers, Engineers and Planners regarding the **Beyond the Guidebook** provincial initiative.

Beyond the Guidebook Explained

Signed by **Glen Brown**, the purpose of the Circular is to explain how a number of provincial initiatives support and/or complement each other. Glen Brown is the Executive Director, Local Government Infrastructure and Finance. "We want regional and municipal governments to be informed that the **Beyond the Guidebook** approach to rainwater management is endorsed by the Province and reflects a 'design with nature' approach to climate change adaptation," states Glen Brown.

Kim Stephens, Stormwater Guidebook project manager and principal author, provides this perspective: "In 2002, the Guidebook introduced the concept of **Performance Targets** to facilitate implementation of the *integrated strategy* for managing the complete rainfall spectrum. The Guidebook made a distinction between Runoff Capture and Rate Control, and emphasized that a combination of the two is necessary for effective rainwater management. It is in addressing the inter-relationship between Runoff Capture and Rate Control that Beyond the Guidebook picks up where the Guidebook left off in 2002."

"The Beyond the Guidebook methodology enables us to correlate green infrastructure effectiveness in protecting stream health," explains **Jim Dumont, Engineering Applications Authority** for the Inter-Governmental Partnership. "The reason is that rainwater runoff volume management is directly linked to stream erosion and water quality."

Adapting the Surrey Experience

Looking back, application of the water balance methodology to **East Clayton** can now be seen as the genesis for the Beyond the Guidebook methodology. "With hindsight, the significance of East Clayton is two-fold. It was an early application of performance targets at a neighbourhood scale. Also, and most importantly the analysis combined mass balance and flow duration to test the achievability of performance targets," continues **Jim Dumont**.

"But it was the **South Newton** case study where the methodology really came together in terms of how to integrate the mass balance and stream erosion analyses. Until then, they were separate analyses."

"In South Newton, we were able to demonstrate that distributed rainwater infiltration systems could result in a multi-million dollar net reduction in the City's 10-Year Capital Plan, while enabling development to proceed. The saving results from elimination of a number of detention ponds."

"The experience gained in East Clayton and South Newton was then applied in **Fergus Creek**. The Beyond the Guidebook methodology was formalized as the **Stream Health Methodology**, and subsequently incorporated in the Water Balance Model when it was integrated with the QUALHYMO engine. The Stream Health Methodology is a function of flow duration, and hence stream erosion," concludes Jim Dumont.

The Beyond the Guidebook initiative builds on the Guidebook foundation:

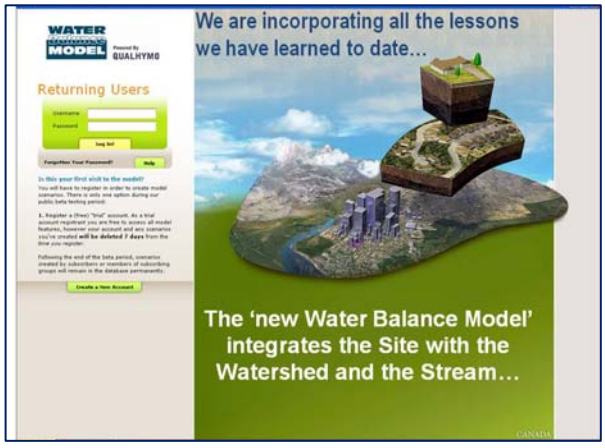
- **Guidebook** emphasis is on rainfall capture (volume control) at the site scale
- **Beyond the Guidebook** focus is on the relationship between volume control and resulting flow rates in streams

5. Informing Land Development Strategies

"In Module 6, **Jim Dumont** will illustrate how the Water Balance Model can be applied to improve land use decision-making," states **Raymond Fung, Chair** of the Green Infrastructure Partnership. "He will NOT be doing a hands-on tutorial about model inputs and outputs. Rather, he will be providing an overview of where we are and how we got here."

"Our knowledge is increasing as we gain a better understanding of physical processes and interconnections," continues **Jim Dumont**. "A key message is that we can adapt our guiding framework to reflect our understanding.

"Historically, engineers have typically been called in after the fact to solve drainage problems resulting from land development activities that ignored the water balance. **Beyond the Guidebook** is about developing land differently so that we can prevent rainwater runoff volume from impacting on streams."



What Will Our Neighbourhoods Look Like?

"When we develop or redevelop land, our starting point should be: *What do we want our neighbourhoods look like?* The built-form influences how much rainwater runoff volume is generated; and it determines what our options may be for capturing rain where it falls. So we need to look at ways to provide more green space that can serve more than one purpose," states Jim Dumont.

"On March 12th, we will present a number of examples to illustrate what can be accomplished by developing land differently. We will show that we can in fact achieve our two desired outcomes, namely: create liveable communities and protect stream health. The examples will compare and contrast density versus hardscape."

"A key message is that you can only do so much infiltration on a small lot. This means we have to be looking at 'green streets' and multi-use greenways to achieve watershed-specific performance targets for rainwater runoff volume and rate reduction," concludes Jim Dumont.

Poster Session with Richard Boase

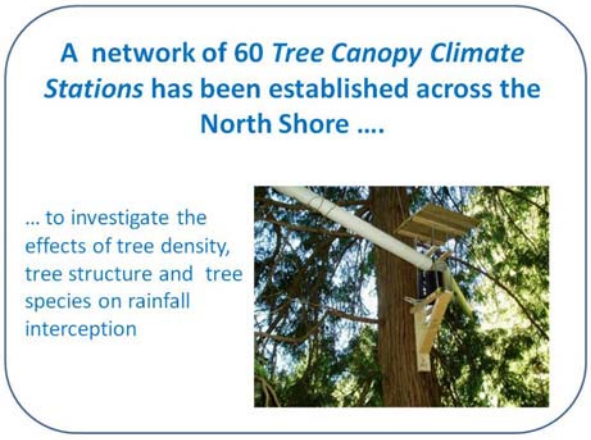
"To hold the attention of the Forum audience, and have a high-energy finish, we have something different planned for Module 6," states **Kim Stephens**. "We will make it worthwhile to stay until the end."

"**Richard Boase** of North Vancouver District will lead a poster session that should be quite stimulating. Richard will have a selection of photos and images mounted on poster boards to generate ideas and discussion. This will create the town hall sharing."

"The focus of the poster session will be on what one can do at the site scale," adds **Richard Boase**. "My objective is to demonstrate 'design with nature' opportunities that are easy to implement. The poster session will be totally interactive and completely spontaneous."

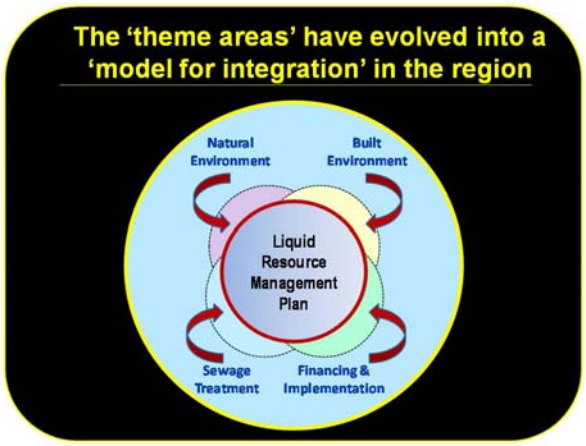
"This will not be a PowerPoint presentation. Rather, I will be saying: *Let's have a conversation about this picture; so, what goes through your mind when you look at this image?*"

"In addition to poster boards, I will be bringing one of the climate stations that we are using for the **UBC Tree Canopy Interception Research Project**. Sixty are installed in trees across the three North Shore municipalities. I will also be demonstrating how water moves through soil."



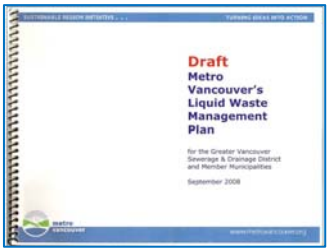
6. Regional Team Approach

"In holding the Surrey Forum, our vision is that this event will be the catalyst for additional regional forums that would be organized in collaboration with Metro Vancouver's Stormwater Interagency Liaison Group.... i.e. SILG," states **Ted van der Gulik**. "One of our goals is to implement an educational program that would be modelled on the **Vancouver Island Learning Lunch Seminar Series**."



Liquid Waste Management Plan

"Metro Vancouver's Liquid Waste Management Plan is the appropriate vehicle for bringing the desired collaboration to fruition," adds **Kim Stephens**. He represents the Water Sustainability Action Plan on the **Metro Vancouver LWMP Reference Panel**, an advisory group that was appointed by the Metro Vancouver Regional Board in April 2008 and reports directly to the Metro Vancouver Waste Management Committee.



The mandate of the Reference Panel is to provide comments and advice on the strategies for updating the Liquid Waste Management Plan. In its July 2008 reporting out to the Metro Vancouver Waste Management Committee, the Reference Panel raised questions about the Integrated Stormwater Management Plan (ISMP) process and outcomes to date. The Reference Panel also brought this matter to the attention of the Regional Engineers Advisory Committee (REAC) in a February 2009 meeting.

A Model for Integration

"A significant contribution by the Reference Panel was the suggestion to organize and communicate the Liquid Waste Management Plan around four theme areas," reports **Kim Stephens**. "The Reference Panel then applied a Venn diagram way-of-thinking to conceptualize integration. The regional team approach to rainwater management and green infrastructure falls within the Built Environment theme area."

"The LWMP comprises eight strategies to achieve two over-arching goals; it also identifies actions to be led by SILG under four of those strategies. The LWMP specifically references collaboration with the Green Infrastructure Partnership and the Water Balance Model partnership to facilitate on-site rainwater management and promote innovative approaches to sustainable infrastructure," summarizes Kim Stephens.

"High-level endorsement of the Draft LWMP by Metro Vancouver municipalities creates the opportunity to build on the momentum that we believe will be generated by the Surrey Forum, and to further align local actions under a regional team framework," concludes **Ray Fung**, Chair of the Green Infrastructure Partnership.

Water Bucket Web Story #4 posted February 2009

Convening for Action in Metro Vancouver

Provincial Context: Today's Expectations are Tomorrow's Standards for Green Infrastructure

City of Surrey hosts Water Balance Model Forum on March 12, 2009

Convening for Action in Metro Vancouver

City of Surrey hosts Water Balance Model Forum

Water Bucket Web Story #5 posted March 2009

Convening for Action in the Metro Vancouver Region

How do we simultaneously work together as staff within a municipality and as a region AND externally with developers and other private sector players, to ensure we implement sustainable approaches to development?

The foregoing challenge provides context for advancing a 'regional team approach' at the **Metro Vancouver Water Balance Model Forum** on March 12, 2009. Hosted by the City of Surrey, this learning event is co-sponsored by the **Water Balance Model Inter-Governmental Partnership** and the **Green Infrastructure Partnership**.

1. Living Water Smart, BC's Water Plan

"A provincial policy framework is now in place that enables municipalities to 'do business differently' in order to design their communities to live in harmony with water," states **Lynn Kriwoken**, **Director,** Innovation and Planning in the Water Stewardship Division of the Ministry of Environment, and the Province's lead person for delivery of **Living Water Smart, BC's Water Plan**.

"By living water smart, communities will be more prepared for climate change and their quality of life will be enhanced."

B.C.'s Plan to protect and preserve water resources through planning, regulatory change, education, and incentives such as economic instruments and rewards.

The Story of the Surrey Forum

"This is the fifth in a series of stories leading up to the Forum, explains **Kim Stephens**, Program Coordinator for the **Water Sustainability Action Plan for BC**. "Their purpose is to progressively connect the dots and foreshadow what participants can expect on March 12th."

"This Story #5 describes the parts that **Lynn Kriwoken, Karen Rothe, Ray Fung** and **Vincent Lalonde** will play in providing cascading provincial, regional and local perspectives."

Organized under the umbrella of the Water Sustainability Action Plan for British Columbia
By the Water Balance Model Inter-Governmental Partnership
In collaboration with the City of Surrey and Green Infrastructure Partnership

2. Forum Program – An Overview

"A key message in Living Water Smart is that green development makes sense," emphasizes **Lynn Kriwoken**. "New thinking about development leads to new benefits. These include more green spaces, more water and fish in the streams, improved community vitality, reduced demand for water, and reduced expenditure on infrastructure."

Living Water Smart & Making Green Choices

"The picture described by Lynn Kriwoken provided the rationale for selecting *Living Water Smart & Making Green Choices* as the title for the Forum," continues **Ray Fung, Chair of the Green Infrastructure Partnership**. "The Forum program is built around the *HOW question* as it pertains to green infrastructure: HOW will the City of Surrey ensure it gets built right; HOW will a consistent regional approach be achieved in Metro Vancouver?"

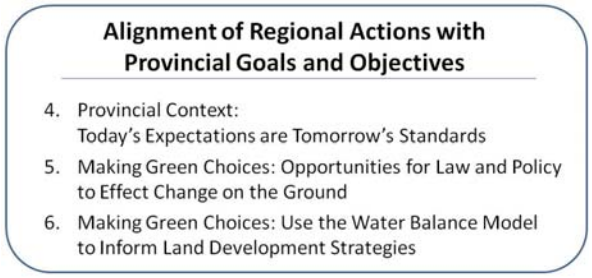
Starting a Dialogue:

"The morning and afternoon parts of the program each comprise three modules," adds **Vincent Lalonde, General Manager (Engineering) with the City of Surrey**. "The Forum is designed to start a dialogue between policy-makers and project implementers.

Alignment with Provincial Goals

"We describe Module 4 in the afternoon as the bridge between the morning and afternoon sessions," explains **Kim Stephens**. "Because examples inform policy, we decided to do things differently. The focus of the morning session is on the nuts-and-bolts of Surrey green infrastructure design and construction experience, mainly because the City is moving beyond pilot projects to a broader watershed objectives approach."

"In the afternoon, we will look at the big picture and explore how policy and legal tools can help regulators, developers and designers collaborate to ensure responsible outcomes. For the discussion of local actions to be fully informed, we also need to have the provincial and regional context. Hence, the reason why the module titled *Today's Expectations are Tomorrow's Standards* provides the bridge between the morning and afternoon."



3. Today's Expectations are Tomorrow's Standards

The phrase ***Today's Expectations are Tomorrow's Standards*** was unveiled by the Ministry of Community Development in November 2007 at the **Beyond the Guidebook Seminar.** Held in Vancouver, this event was organized by the Green Infrastructure Partnership in collaboration with the Association of Professional Engineers of BC and the Inter-Governmental Partnership.

Green Mandate of the Ministry of Community Development Explained

The seminar was designed to inform local government and land use practitioners regarding the then emerging policy framework and senior government expectations for applying a **Beyond the Guidebook** approach to land development and watershed management.

According to **Karen Rothe, the Ministry's Manager for Metro Vancouver and Fraser Valley Growth Strategies,** and a Ministry representative on the Green Infrastructure Partnership, "At the *2007 Beyond the Guidebook Seminar*, we explained why and how the Ministry of Community Development has an increasing role in ensuring that local governments are advancing and changing the ways they plan and design their communities for the better."

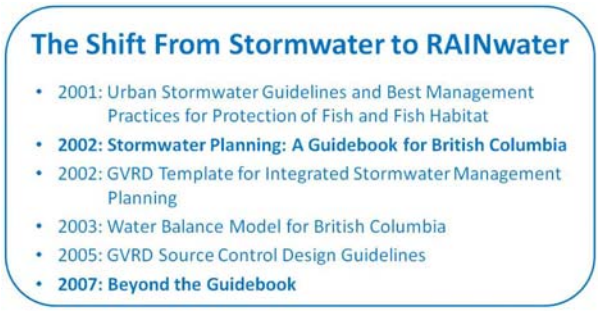
"We also described how the Ministry is using the Green Communities Project to advance green infrastructure province-wide. We emphasized that we are slowly raising the bar for local government. For example, we are saying 'show us what you are doing to protect stream health'. The Ministry is also providing cash awards to recognize the efforts of local governments in achieving **design with nature outcomes**."

4. Beyond the Guidebook: Federal Fisheries Perspective

At the *2007 Beyond the Guidebook Seminar,* **Corino Salomi** of the federal Department of Fisheries and Oceans (DFO) complemented the provincial presentation with the federal perspective. This coordinated approach resulted in consistency of messaging by the two levels of governments. Corino Salomi is Area Manager, Oceans, Habitat & Enhancement Branch, Lower Fraser Area. He represents DFO on the steering committees for both the Green Infrastructure Partnership and the Inter-Governmental Partnership.

"We are moving from guidelines to tools," Corino Salomi noted when introducing the road-map for his presentation. "The purpose of the **Beyond the Guidebook** initiative is to help local governments and the development community establish what level of rainwater runoff volume reduction makes sense at the site, catchment and watershed scales."

His presentation provided a perspective on the shift from Stormwater Management to RAINwater Management.

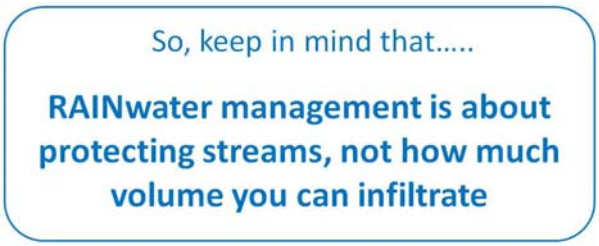


Runoff-Based Approach

"Drainage practice is at a crossroad in the path defining the methodologies and applications used in rainwater management. **Beyond the Guidebook** makes a clear distinction between a rainfall-based approach and a runoff-based approach. The runoff-based methodology at the heart of **Beyond the Guidebook** has been incorporated in the new Water Balance Model."

"The **Beyond the Guidebook** methodology will allow practitioners to assess both site-level rainwater management measures AND flood relief projects so that they can develop a watershed approach that addresses stream protection and/or restoration. In the process, practitioners will view the watershed and its streams from a much more holistic perspective."

"We now have the tools and the experience to **design with nature** and **move from stormwater management to RAINwater management**", Corino Salomi stated in his closing remarks. He summarized by emphasizing that the objective is protect stream health, which is broader than how much volume one can infiltrate on a particular development. "While we need to have volume reduction targets, at the end of the day it is how effectively we apply the suite of available rainwater management tools that will ultimately determine whether we will succeed in protecting stream health at a watershed scale."



5. Doing Business Differently in BC

"Beyond the Guidebook supports and/or complements other provincial initiatives, notably: Living Water Smart, the Green Communities Project, the Climate Action Plan, Smart Planning for Communities, and A Guide to Green Choices," observes **Ray Fung**. "Collectively, these initiatives establish expectations that, in turn, will influence the form and function of the built environment in general and green infrastructure on the ground in particular."

"The built environment and natural environment are connected. So, improving the built environment can protect or help restore the natural environment. How we develop or redevelop individual sites has ripple effects at the watershed scale. By designing with nature, this means actions on the ground can result in cumulative benefits over time."

"To get to the big picture, it starts with the smallest pieces. This is the reason we are placing emphasis on the nuts-and-bolts of Surrey green infrastructure design and construction experience."

Protecting Stream Health

"Living Water Smart encourages local governments to do business differently, prepare communities for change, and choose to be water smart," adds **Lynn Kriwoken**. "The lynch-pin of Living Water Smart is the policy statement found on page 43:

- *All land and water managers will know what makes a stream healthy, and therefore be able to help land and water users factor in new approaches to securing stream health and the full range of stream benefits.*"

"Shifting our focus to stream health requires substantial time and effort on the part of governments, communities, and other partners. Imagine neighbourhoods that have plentiful trees to catch the rain, so water seeps slowly into the ground instead of rushing straight into storm drains and creeks. Imagine neighbourhoods that have fish in the creeks that our kids can catch and eat," concludes Lynn Kriwoken.

Shared Responsibility

The Forum will address this question: **So, what does the policy statement on page 43 of Living Water Smart mean to those involved in land development or redevelopment?**

"We are approaching the Forum program from a *shared responsibility perspective*. Everyone will benefit from attending both the morning and afternoon sessions. The policy people will have an appreciation for what is involved in constructing green infrastructure; and the implementers will understand what the provincial, regional and local goals are….and what we are trying to achieve through the use of policy, approved standards and legal tools," states **Vincent Lalonde**.

6. Regional Alignment

"Shared responsibility is at the core of a regional team approach," continues **Ray Fung**. "We all have a role to play in enhancing the quality of life in our own communities, and preparing for climate change. This also means we have an equal responsibility to strive for the *common good.*"

Partnerships and Collaboration

"To achieve the *common good* requires bringing together:

- ✓ **Local government** - those who plan and regulate land use;
- ✓ **Developers** - those who build;
- ✓ **The Province** - those who provide the legislative framework;
- ✓ **Universities and colleges** - those who provide research; and
- ✓ **The stewardship sector** – those who advocate conservation of resources."

"To get to the big picture, it starts with the smallest pieces. This is why the Surrey Forum is advancing a regional team approach that aligns local actions with provincial policy goals. Making this happen requires partnerships and collaboration."

Creating Our Future

"We see the Forum as providing an opportunity to generate positive energy in the region. In particular, the Forum will inform the actions identified in the rainwater/stormwater component of Metro Vancouver's updated **Liquid Waste Management Plan**," states **Ray Fung**. "We believe this is where the opportunity for implementing a regional team approach resides."

"We anticipate that the town hall sharing sessions will show that there are solutions if people talk to each other about what they each could do differently. This will help all parties collaborate to more effectively fulfil their piece of the sustainable development puzzle."

"Once we know what we want our watersheds and neighbourhoods to look like, the next step is to decide *what the tools are that will get us there,"* concludes **Vincent Lalonde**. "All of us ….whether we are regulators, developers or designers ….need to understand and care about the goal if we are to create the future that we all want."

Water Bucket Web Story #5 posted March 2009

Living WaterSmart

PREPARING COMMUNITIES FOR CHANGE

green development makes sense

To estimate the true cost of a development project, the entire life of the project and its impacts must be considered. In the past, communities were developed when water was regarded as a 'free good' of little or no value. That is no longer so.

New thinking about development leads to new benefits. These include more green spaces, more water and fish in the streams, improved community vitality, reduced demand for water, and reduced expenditure on infrastructure.

To recognize these extra benefits, government will provide incentives to developments that store more greenhouse gases by restoring sections of streams or wetlands.

It won't be easy to always make the best choices for our communities, but if we all work together we will balance social, economic and environmental values in our community plans.

GOVERNMENT POSITION

Wetland and waterway function will be protected and rehabilitated.

Government will provide incentives for the restoration of streams or wetlands.

Green developments waiting for provincial environmental approvals will be fast-tracked and given priority.

67

- reproduced from **Living Water Smart**, page 67

Convening for Action in Metro Vancouver

Living Water Smart and Making Green Choices to Create Liveable Communities and Protect Stream Health

Moving Beyond Pilot Projects to a Broader Watersheds Objectives Approach

Convening for Action in Metro Vancouver

City of Surrey hosted Water Balance Model Forum on March 12, 2009

Moving Beyond Pilot Projects to a Broader Watersheds Objectives Approach

Moving Beyond Pilot Projects

Hosted by the City of Surrey, the **Metro Vancouver Water Balance Model Forum** attracted an audience of 90-plus on March 12. The Forum program was built around the ***HOW question*** as it pertains to green infrastructure:

- HOW will the City of Surrey get it built right;
- HOW will a consistent regional approach be achieved in Metro Vancouver?

The Forum was co-sponsored by the Water Balance Model Inter-Governmental Partnership and the Green Infrastructure Partnership, with a goal of moving beyond pilot projects to a watershed-based approach to achieving performance targets for rainwater management and green infrastructure.

The Forum Audience

"The audience comprised a mix of Surrey staff from different departments, developers and designers who do work in Surrey, representatives from a large number of Metro Vancouver municipalities, and provincial regulators. At the end of the day, this learning event had achieved our stated objective of starting a dialogue between policy-makers and project implementers," reports **Kim Stephens**, Forum team leader and **Program Coordinator for the** Water Sustainability Action Plan for British Columbia, "

The Challenge

The Forum was undertaken as part of the implementation program for **Convening for Action in British Columbia** in order to promote alignment of local actions in Metro Vancouver with provincial goals as stated in Living Water Smart, BC's Water Plan. The following challenge statement provided a frame-of-reference for advancing a consistent 'regional team approach' in Metro Vancouver:

- *How do we simultaneously work together as staff within a municipality and as a region AND externally with developers and other private sector players, to ensure we implement sustainable approaches to development?*

Examples inform policy. Case studies in the morning session provided the policy people with an appreciation for what is involved in constructing green infrastructure. The afternoon session then provided the implementers with an understanding of provincial, regional and local goals…and what they are intended to achieve.

Convening for Action in Metro Vancouver

City of Surrey hosted Water Balance Model Forum on March 12, 2009

Moving Beyond Pilot Projects to a Broader Watersheds Objectives Approach

The Story of the Forum

Leading up to the Forum, a set of five stories was published on the Water Bucket Website. These tell the story of the Forum by describing the scope of each module and connecting the dots. To access these stories as well as the downloadable versions, click on Living Water Smart and Making Green Choices in the Metro Vancouver Region.

Also, to download a concise synopsis of the Forum, including Key Messages, click on Metro Vancouver Water Balance Model Forum: Moving Beyond Pilot Projects to a Broader Watersheds Objectives Approach. This summary document is complete with a joint statement by Vincent **Lalonde, Raymond Fung** and **Ted van der Gulik**, the leaders of the three sponsoring entities. Their joint statement is reproduced below.

Joint Statement by the City of Surrey, Inter-Governmental Partnership and Green Infrastructure Partnership:

"To get to the big picture, it starts with the smallest pieces. For this reason, the Surrey Forum is advancing a regional team approach that aligns local actions with provincial policy goals as articulated in the Living Water Smart and the Green Communities initiatives Making this happen requires **partnerships, collaboration, innovation** and **integration**.

We see the Forum as providing an opportunity to generate positive energy in the region. In particular, the Forum will inform the actions identified in the rainwater/stormwater component of **Metro Vancouver's updated Liquid Waste Management Plan**. We believe this is where the opportunity for implementing a regional team approach resides.

We anticipate that the Forum sharing sessions will show that there are solutions if people talk to each other about what they each could do differently. This will help all parties collaborate to more effectively fulfil their piece of the sustainable development puzzle.

Once we know what we want our watersheds and neighbourhoods to look like, the next step is to decide *what the tools are that will get us there*. All of us ….whether we are regulators, developers or designers ….need to understand and care about the goal if we are to create the future that we all want."

Convening for Action in Metro Vancouver

City of Surrey hosted Water Balance Model Forum on March 12, 2009

Moving Beyond Pilot Projects to a Broader Watersheds Objectives Approach

Key Messages

"The Forum program was comprehensive in scope and intensive in detail," states **Kim Stephens**. There was a lot for the audience to remember. So, for ease of reference, we synthesized one key message for each module: In effect, the key messages are the learning outcomes."

1. **Establishing Expectations:**
   A decade of experience has enabled the City of Surrey to move beyond pilot projects to a broader watersheds objectives approach to rainfall capture and green infrastructure

2. **East Clayton Lessons Learned:**
   Establish watershed targets that are characteristic of actual conditions, and are achievable.

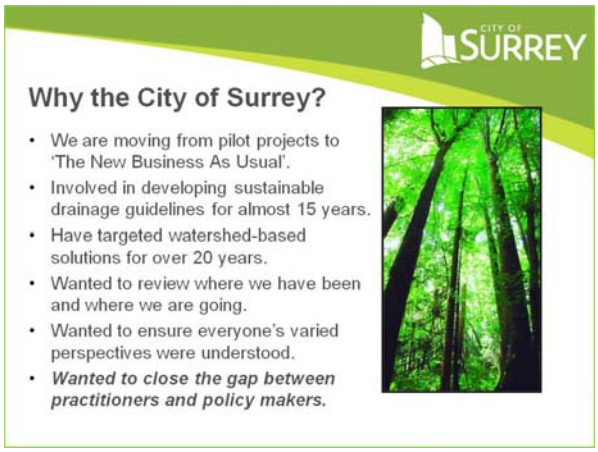
3. **Effective Implementation of Green Infrastructure - Making it Work**
   Getting it built right is a shared responsibility; and depends on collaboration among regulators, developers and designers.

4. **Today's Expectations are Tomorrow's Standards for Green Infrastructure:**
   A provincial policy framework is now in place that enables municipalities to align efforts at a regional scale, make green choices, prepare communities for change, and choose to be water smart.

5. **Making Green Choices - Opportunities for Law and Policy to Effect Change:**
   Policy, approved standards and legal tools can help regulators, developers and designers collaborate to ensure responsible outcomes.

6. **Use the Water Balance Model to Inform Land Development Strategies:**
   Planning and water balance modeling need to be done together, and the WBM is a tool that enables integration, especially when there is a commitment to integrate land planning and green infrastructure.

"The Forum was a success," adds **Remi Dubé**, Drainage Planning Manager with the City of Surrey, and the individual responsible for developing the morning program. "We have been getting some pretty good feedback from many of the people who attended the workshop (specifically developers and consultants). It's leading into more direct communication with certain developers who are looking at different approaches ... they seemed encouraged with the dialogue that the forum appeared to promote."



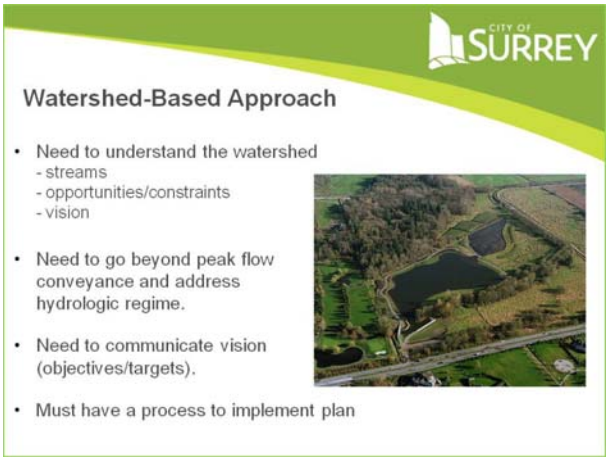
PowerPoint Presentations & Links to YouTube Videos

To both provide a record of the day and capture the flavour of presentation segments at the Forum, video clips have been selectively uploaded to YouTube. The maximum length is 10 minutes. Links to YouTube videos and associated PowerPoint presentations are listed below. You can listen to the audio track while scrolling through the corresponding PowerPoint slides.

Module 1 - Context and Overview: Establishing Expectations for a Watersheds-Based Approach

Vincent Lalonde and **Ted van der Gulik** opened the Forum by providing the City and inter-governmental perspectives, respectively, on the learning outcomes. To view their combined PowerPoint slides, click on Establishing Expectations. To hear what each had to say, and to view what is posted on YouTube, click on Vincent tells the City's story and Ted explains Why an Inter-Governmental Partnership. Each video is 6 minutes.

Remi Dubé followed with an historical perspective on how drainage planning in Surrey has evolved since the 1970s, and how key neighbourhoods embody the Surrey sustainability vision. To view his PowerPoint slides, click on Historical Perspective. To hear what Remi had to say, click on Part 1 - Where We Came From and on Part 2 - Where We Are Going to access the YouTube videos.

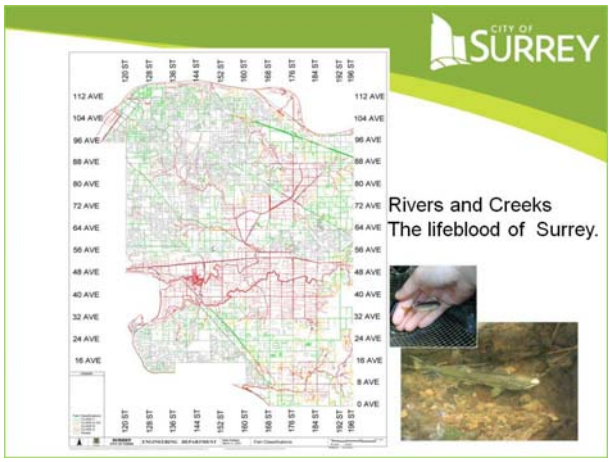


Module 2 - East Clayton Sustainable Community: Lessons Learned On-the-Ground

The East Clayton story was presented in two parts. First **David Hislop** provided the sustainability context. Then **Jim Dumont** reviewed the implementation experience for private and public rainfall capture systems, and reflected on lessons learned. To view their respective presentation slides, first click on The Story of East Clayton and then click on Lessons Learned at East Clayton.

David Hislop Jim Dumont

To hear what David had to say and be entertained, first click on Part 1 - Why a Sustainable Community in East Clayton & What are the Sustainability Principles?; and then click on Part 2 - Lessons We Have Learned. To hear what Jim had to say on the performance aspects of 'sustainable drainage', click on this link to What the Models Show & Overcoming Implementation Challenges.

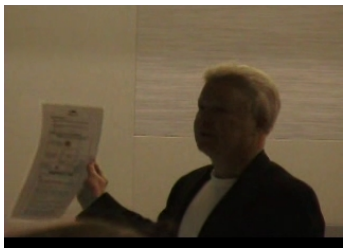


Module 3 - Effective Implementation of Green Infrastructure: Making It Work in Surrey

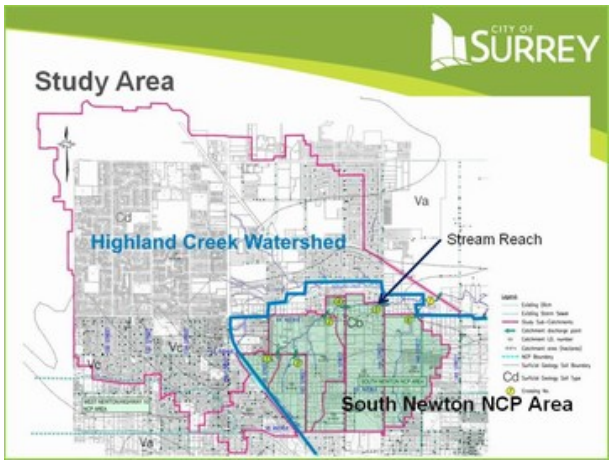
This module was presented in three parts. First, **James Kay** told the story of Grandview Heights from the consultant's perspective in developing the Neighbourhood Concept Plan. Then **Ken Anderson** provided the developer's perspective on why "it makes good business sense" to do business differently. After that, **Jim Dumont** told the story of how innovation in South Newton had come about.

James Kay explained his involvement in three Neighbourhood Concept Plans that were developer-driven, and emphasized that the City challenged the developers to meet performance criteria. To hear what James Kay had to say, click on Part 1 - Looking Back to See Where We Came From and Part 2 - How We Met the Performance Criteria for Rainfall Capture and Infiltration. "We wanted to select the measures that would provide the best value," stated James Kay. "For example, catch basins send drainage water to infiltration trenches. We kept this system offline until after the sediment and erosion control situation had stabilized."

Ken Anderson is the development manager for Morgan Heights community in Grandview Heights. To hear what Ken had to say about enforcement and shared responsibility, click on Making It Happen at the Site Scale to access a 10-minute YouTube video clip. "Cash compliance is the ultimate hammer," states Ken Anderson. "We tell the homeowners and builders upfront what we expect on the site and on the street. This requires a lot of hands-on attention and consistent enforcement to ensure consistent compliance."



Jim Dumont followed with the South Newton story to illustrate *ask a different question, get a different answer*. To view Jim's presentation slides, click on either on the Update on South Newton Experience or on the image below; and to hear what he had to say, click on Eliminating Detention Ponds to link to the YouTube video clip.



Module 4- Provincial Context: Today's Expectations are Tomorrow's Standards for Green Infrastructure

Module 4 provided the bridge between the morning and afternoon sessions. Members of the steering committees for the Green Infrastructure Partnership and Water Balance Model Inter-Governmental Partnership provided cascading provincial, regional and local perspectives on the policy framework for rainwater management and green infrastructure. To view the presentation slides that provided a backdrop for this panel session, click on Today's Expectations are Tomorrow's Standards. To hear what everyone had to say, click on the following links to a set of YouTube video clips which are typically between two and three minutes in duration:

1. **Kim Stephens** states the learning outcomes for the afternoon session

2. **Remi Dubé,** City of Surrey Drainage Planning Manager, recaps the morning outcomes and the direction in which Surrey is heading

3. **Ted van der Gulik** describes what is coming next with the Water Balance Model

4. **Karen Rothe,** Manager for Metro Vancouver and Regional Growth Strategies, explains the Ministry of Community Development role in promoting the right kind of development in the right place

5. **Corino Salomi,** Area Manager, Oceans, Habitat & Enforcement Branch, Lower Fraser Area, elaborates on how the Department of Federal Fisheries & Oceans now views performance targets and determining what is achievable.

6. **Ed von Euw,** Senior Engineer in the Policy and Planning Division of Metro Vancouver, provides insight into the current consultation process for updating the region's Liquid Waste Management Plan, in particular the rainwater/stormwater component.

7. **John Sidnell,** representing the Master Municipal Construction Documents Association on the Green Infrastructure Partnership, describes the mandate of the MMCD committee that is developing a new specification for detention and infiltration structures.

8. **Richard Boase** of the District of North Vancouver, and the new Co-Chair of the Inter-Governmental Partnership, talks about the role of all Forum participants in ensuring that collectively we truly do business differently.

9. **Paul Ham,** the Past-Chair of the Green Infrastructure Partnership and Surrey's former City Engineer, speaks about handing from the Previous Generation to the Next Generation; and emphasizes that through a learning, evolutionary process we can create a better tomorrow.

10. **Lynn Kriwoken**, Director, Innovation and Planning in the Watershed Stewardship Division of the Ministry of Environment, is the Province's lead person for delivery of **Living Water Smart, BC's Water Plan**. Lynn emphasizes that the policy statement on page 43 is the lynch-pin of Living Water Smart.

The Premier's Office has produced a 2-minute video that features Ted van der Gulik and Kim Stephens telling the story of what the Water Balance Model means for British Columbia. To view the video and learn more about "the story of the Water Balance Model", click on this link to Premier's Award recognizes the Water Balance Model for its innovation and excellence.

Module 5 - Making Green Choices: Opportunities for Law and Policy to Effect Change on the Ground

The purpose of Module 5 was to explore how policy and legal tools can help regulators, developers and designers collaborate to ensure responsible outcomes. **Susan Rutherford** of the Green Infrastructure Partnership facilitated the session; she was assisted by **Sam Lau**, the City's Manager of Land Development Services.

To view the set of PowerPoint slides that provided the frame-of-reference for a town hall sharing session, click on Opportunities for Law & Policy to Effect Change on the Ground.

To hear what **Susan Rutherford** had to say when she opened the town hall sharing session, click on Shared Responsibility to link to the YouTube video (8 minutes). After that, and to hear **Sam Lau** explain the City's processes, click on Three Processes that Ensure On-Lot Compliance (10 minute YouTube video).

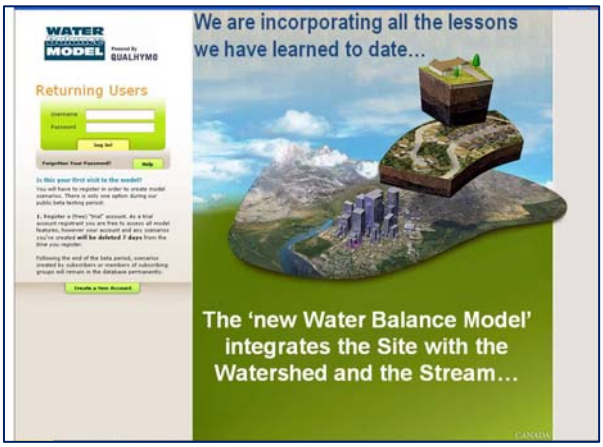
"Currently, building permits are not released until the on-lot infiltration systems are certified by a qualified professional engineer. This provides the City with considerable leverage to ensure compliance," states Sam Lau.

Module 6 - Making Green Choices: Use of the Water Balance Model to Inform Land Development Strategies

To bring the Forum storyline to a conclusion **Jim Dumont** framed his presentation in these terms: "When we develop or redevelop land, our starting point should be: *What do we want our neighbourhoods to look like?"*

To view his PowerPoint slides, click on Making Green Choices. To hear what he had to say when he spoke to this question, first click on Part 1 - Why a Watershed Vision is Critical; and then click on Part 2 - Using the Water Balance Model.

Kim Stephens closed out the day by drawing audience attention to the Build a Vision, Create a Legacy mantra of *Stormwater Planning: A Guidebook for British Columbia*. A segue was provided by Jim Dumont.



This story is posted on the Water Bucket Website; click on the following links to access the online version:
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