



**the partnership
for water sustainability in bc**

IREI - Inter-Regional Education Initiative



Green Infrastructure Innovation in Langley Township

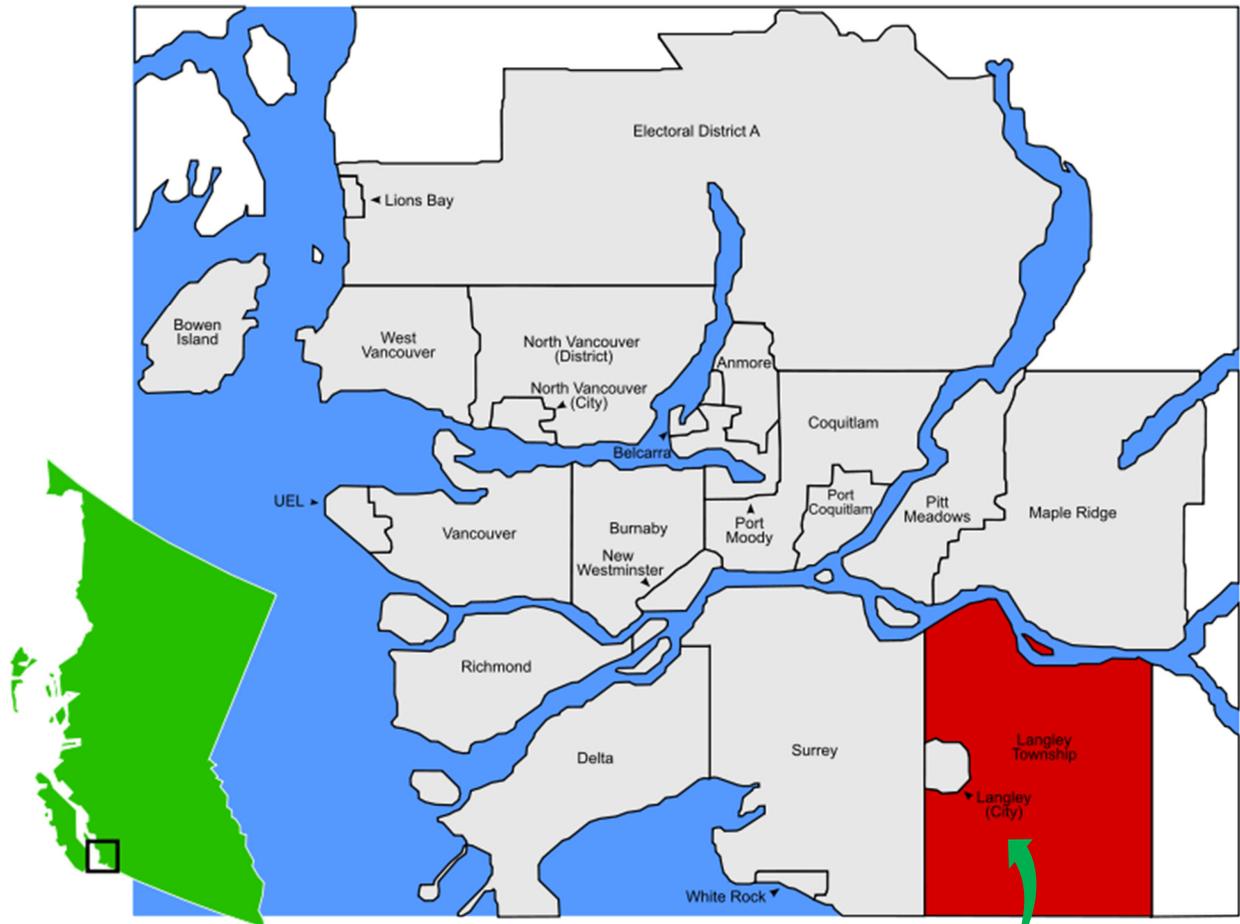
‘Design with Nature’ to Create Liveable Neighbourhoods



Rain garden on 211th Street in the Yorkson neighbourhood

October 2017

*This publication is the 5th in the Partnership’s
“Watershed Blueprint Case Profile Series”*



Township of Langley, Metro Vancouver Region

A program deliverable for “Sustainable Watershed Systems, through Asset Management” -
An initiative under the umbrella of the Water Sustainability Action Plan for British Columbia

Green Infrastructure Innovation in Langley Township: What the reader will learn from this Case Profile

Time provides perspective!

We all learn from stories and the most compelling ones are based on the experiences of champions who are leading by example in their communities. The story of green infrastructure innovation in Langley Township is indeed compelling.

In 2007, the Township hosted one of three events in the Metro Vancouver Showcasing Green Infrastructure Innovation Series. A decade later, we have the perspective of time when we reflect on their approach and connect the dots between past, present and future.

*In 2007, the Township chose **Harmony and Integration** as its theme. A decade later, how have things played out? Is the Township accomplishing what it set out to achieve with its bold vision for an attractive and liveable community? Is the land and water stewardship ethic deeply instilled in the corporate culture? What is next on the horizon? These questions provide a focus for storytelling and create the storyline for this Watershed Case Profile.*

The stewardship ethic for creating liveable neighbourhoods in Langley is shaped by “cathedral thinking”, that is – a far-reaching vision, a well thought-out blueprint, and a shared commitment by elected representatives, staff and community to long-term implementation.

Design with nature...a whole-system approach...learn by doing and adapt. These three phrases capture the essence of how the Township builds neighbourhoods. The record of success to date is impressive.

*This Watershed Case Profile celebrates the ‘good work’ done by the Township. By showcasing and sharing the ‘story behind the story’ of green infrastructure innovation, our hope is that other communities will learn from Township experience. Langley is demonstrating the critical success factors that must be in play to achieve a vision for **Sustainable Watershed Systems, through Asset Management.***



Kim A. Stephens

Kim A. Stephens, MEng, PEng,

Executive Director

Partnership for Water Sustainability in BC

October 2017

Table of Contents

This table is a synopsis. It distils the essence of each section into a succinct statement. These create a storyline. Readers should pause and reflect on the messages before continuing.

Section Theme	What the Reader will Learn page
<p>Celebration of Green Infrastructure Innovation</p>	<p>Showcasing innovation and celebrating successes promotes networking and builds regional capacity. Sharing and learning from each other helps local governments move ‘from awareness to action’ in order to design with nature.</p> <p style="text-align: right;">1</p>
<p>Integration of Perspectives: Planning, Engineering & Landscape Architecture</p>	<p>Integration of departments and disciplines is embedded in the culture at the Township of Langley. Integration leads to efficiencies. The whole is greater than the sum of the parts. Green infrastructure is an equal component.</p> <p style="text-align: right;">4</p>
<p>Green Approaches to Neighbourhood Development</p>	<p>The Township plans neighbourhoods based on catchment areas. This means managing each as a system. Staff are learning by doing. The structure is set up to support good ideas of an integrated nature so that staff can flourish.</p> <p style="text-align: right;">7</p>
<p>Whole-System, Water Balance Approach</p>	<p>The Township was one of the first municipalities to adopt the Stormwater Guidebook and apply the Water Balance Methodology (WBM). Three neighbourhoods established successive provincial precedents that informed evolution of the WBM.</p> <p style="text-align: right;">10</p>
<p>Looking Ahead</p>	<p>At 2½ to 3% per year, Langley is the fastest growing municipality in the Metro Vancouver region. Protecting the natural values that make Langley attractive underscores the importance of going beyond staff to educate homeowners.</p> <p style="text-align: right;">12</p>

About the Watershed Blueprint Case Profile Series:

The Case Profile Series is unique.

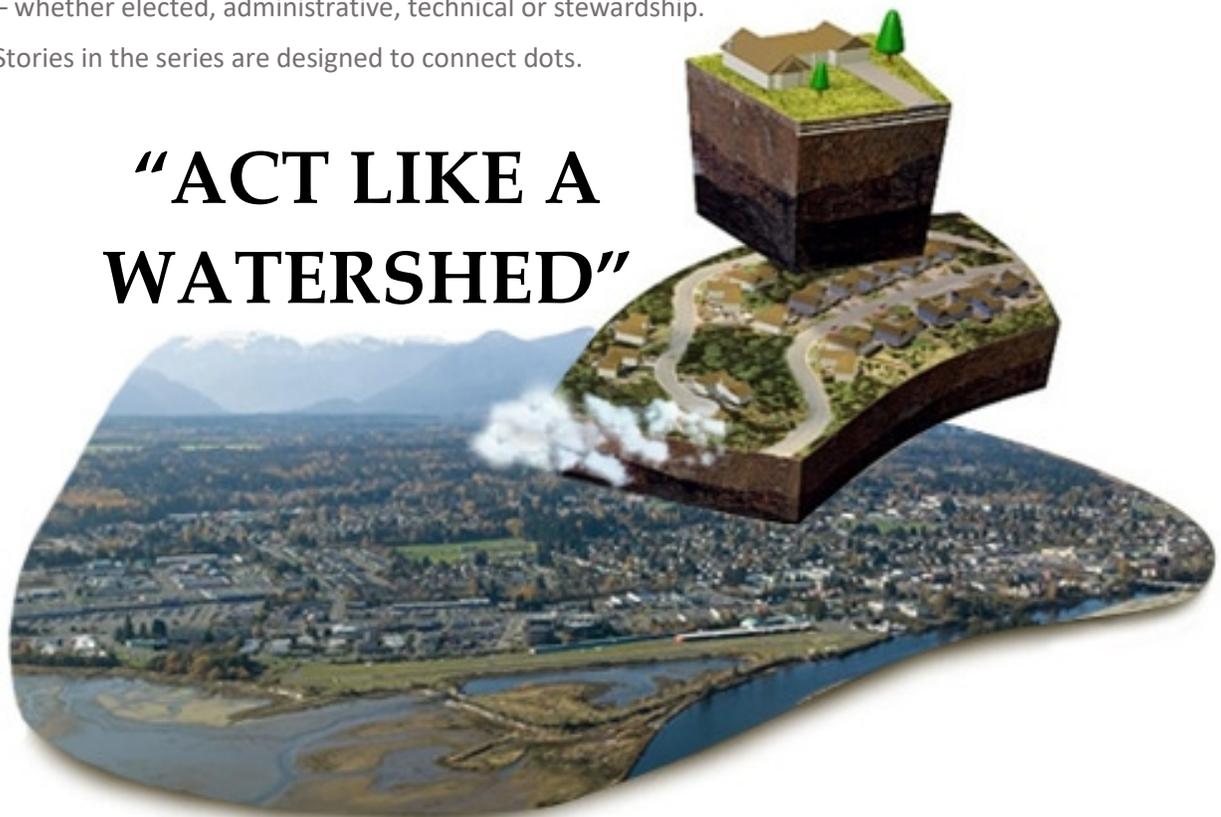
The series showcases and celebrates successes and long-term 'good work' in the local government setting in British Columbia. Our spotlight is on champions in communities which are breaking new ground and establishing replicable precedents.

Stories in the series are written in a magazine style that is easy to read, comprehend and absorb.

Storylines in the series touch lightly on technical matters, yet they are grounded in a technical foundation.

The objective in 'telling a story' is to engage, inform and educate multiple audiences – whether elected, administrative, technical or stewardship.

Stories in the series are designed to connect dots.



“ACT LIKE A WATERSHED”

A watershed is an integrated system:

The need to protect headwater streams and groundwater resources in BC requires that communities expand their view - from one that looks at a site in isolation - to one that considers HOW all sites, the watershed landscape, streams and foreshores, groundwater aquifers...and PEOPLE....function as a **whole system**.

ACKNOWLEDGMENTS: The Partnership for Water Sustainability in BC gratefully acknowledges the financial support of the governments of Canada and British Columbia (through the Clean Water & Wastewater Fund), as well as the support of our regional district partners in the Georgia Basin Inter-Regional Education Initiative (IREI).

The educational goal of the IREI is to build practitioner capacity within local government to implement a whole-system, water balance approach branded as **Sustainable Watershed Systems, through Asset Management**.

Inter-governmental collaboration and funding enable the Partnership to develop approaches, tools and resources; as well as provide teaching, training and mentoring.



About the Partnership for Water Sustainability

The Partnership for Water Sustainability in BC (i.e. “the Partnership”) is a legal entity, incorporated in 2010 as a not-for-profit society, and delivers services on behalf of government. It originated as an inter-governmental partnership, formed in 2002 to fund and develop the Water Balance Model as a web-based decision support tool.

*When the **Water Sustainability Action Plan for British Columbia (Action Plan)** was released in 2004, the Water Balance Model for BC was the centrepiece initiative. Action Plan experience informed development of **Living Water Smart, British Columbia’s Water Plan**, released in 2008, as well as the parallel **Green Communities Initiative**.*

*The Partnership is the hub for a “convening for action” network in the local government setting, is responsible for delivering the Action Plan program through partnerships and collaboration, and embraces a vision for shared responsibility where all the players align their efforts for the common good. The Action Plan program includes the **Georgia Basin Inter-Regional Education Initiative**.*

*The Partnership plays a bridging role between Province, local government and community; and is the steward for **Stormwater Planning: A Guidebook for British Columbia**, a provincial guidance document released in 2002.*

Regional Districts supporting the IREI



C.V.R.D.



Making a difference...together

Celebration of Green Infrastructure Innovation



Charlie Fox
Councillor (1999-present),
Township of Langley

QUOTABLE QUOTE
from opening address,
October 2007

*"The Township is a community of 113,000 of which 75% of the land area is within the Agricultural Land Reserve. This presents a delicate balance between the preservation of agricultural land and the continued pressure for urban development. It is within this context that the staff and Council champion the theme of **harmony and integration** as we endeavour to focus on 'green' initiatives and programs."*

Showcasing Spurs Innovation

The Township of Langley was a co-host for [Showcasing Green Infrastructure Innovation in Metro Vancouver: The 2007 Series](#)¹, organized by the Green Infrastructure Partnership².

The 2007 showcasing event is the natural jumping off point for this Watershed Case Profile. It is a defined moment in time. It serves as a benchmark for judging progress.

Quotable quotes from 2007 are especially valuable. They capture the moment. And a decade later, they are a useful conversation starter to prompt reflection by Township staff.

Showcasing innovation and celebrating successes promotes networking, builds regional capacity, and helps local governments within the Georgia Basin move 'from awareness to action' – through sharing of green infrastructure approaches, tools, experiences and lessons learned as an outcome of **designing with nature**.

Looking back, successive showcasing series on both sides of the Georgia Basin during the period 2006 through 2008 created a ripple effect that spurred even more innovation.

Moving Ahead on a Green Platform: Resource protection – for groundwater supply and fisheries habitat – is the original driver for implementing 'green infrastructure' in Langley. For the past decade and a half, Township staff have been learning and adapting. Their experience is reflected in HOW implementation of Langley's rain garden program has evolved in successive development areas.

In 2017, rain gardens are standard practice in the Township, and standard practice is evolving. Moving ahead on a 'green' platform has gained positive momentum in the Township as Council has found it easy to support the initiatives of the staff.

¹ http://waterbucket.ca/gi/category/showcasing_green_infrastructure_innovation_implement_green_projects/2007_-_metro_vancouver_showcasing_green_infrastructure_innovation_implement_green_projects/

² In 2010, the responsibilities of the GIP were assumed by the Partnership for Water Sustainability in BC when the latter was incorporated as a not-for-profit society



Colin Wright
General Manager,
Engineering (2004-2011)

LANGLEY MANAGEMENT
PERSPECTIVE, Oct 2007

“As municipalities, we are the focal point. We have to show leadership on-the-ground if our society is to achieve sustainability.

“In Langley, we believe there is a sea-change about to happen. The community is ready for green infrastructure.

“When people ask what do I do, my answer is that I build cities. To do that, and do it well, we have to be in harmony with nature.

“When we are in harmony with nature, things will go well.

“This also applies to our corporate philosophy at Langley Township. We are working together and in harmony.”

Harmony and Integration

Titled *Harmony and Integration*, the Langley event in October 2007 showcased what could be accomplished with large-scale projects when Council, the community and staff are in alignment and embrace a ‘green culture’.

Colin Wright (former General Manager, Engineering) and Ramin Seifi (then the Acting General Manager, Planning and Development Services) stood side-by-side to explain the significance and relevance of the *Harmony and Integration* theme. When Colin Wright retired, Ramin Seifi became **General Manager, Engineering and Community Development**. His combined portfolio personifies integration.



Ramin Seifi Colin Wright

How to Move from Research to Implementation: “What we are showcasing today is the outcome of years of inter-departmental collaboration,” stated Ramin Seifi in 2007, “It was not a random decision to choose **Harmony and Integration** as the theme for this Showcasing Innovation event. It captures our core values.”

Ramin added that he is a living example of integration because he is an engineer who heads the planning department. He then elaborated on Langley’s Sustainability Charter.

“After many years of what you would call research, we are now in the developmental phase. Although the Sustainability Charter is high level, it will guide us in terms of providing focus and monitoring progress. Each Charter goal has a supporting set of objectives complete with specific actions,” explained Ramin Seifi.

To illustrate what this meant, he referred to the Environmental Goal and the related objectives for conserving water, reducing energy use, and improving rainwater (stormwater) runoff quality.

“We will be monitoring and measuring what matters. This will enable residents and Council to maintain their focus over time,” concluded Ramin Seifi at the 2007 event.

2007 Showcasing Innovation in Langley

The showcasing concept was an outcome from a local government consultation workshop organized by the Green Infrastructure Partnership in May 2005.

Metro Vancouver municipalities said that they wanted to hear firsthand from those who are implementing green infrastructure, and they wanted to see what it looks like.

The series enabled local governments to tell their stories in a way that no other forum could provide. It encouraged a sense of pride.



First, the project preview



Then, the site visit

2007 Showcasing Program:

Case Study 1
Langley's GHG Strategy

Case Study 2
Protecting Langley's
Groundwater

Case Study 3
Integrated Rainwater
Management;
Harmony & Integration

Case Study 4
Langley Environmental
Partners Society (LEPS)



Integration of Perspectives: Planning, Engineering & Landscape Architecture



Ian McHarg
(1920-2001)

“The shaping of land for human use ought to be based on an understanding of natural process.”

He was a renowned landscape architect, writer, educator, “father of GIS”, founder of environmental planning, and author of **Design With Nature** (1967), one of the most influential works of its kind



Stephen Richardson
Director

Development Services,
Community Development Div'n

Three Groups in One Section

When interviewing Township staff, an obvious question is this: As staff come and go over time, how does the organization sustain the guiding philosophy, core values, and way of doing daily business that are embodied in the phrase ‘*harmony and integration*’? Expressed more succinctly, how does one instill a stewardship ethic in the corporate culture so that the legacy would be lasting?

The Township is progressing on an inter-generational journey.

In 2007, Ramin Seifi and Colin Wright painted a bold vision of a sea-change that would lead to a green infrastructure future. A decade later, the evidence on the ground proves that the ‘green’ vision does indeed have substance. By **designing with nature** (reference: Ian McHarg), the outcome would be *sustainable watershed systems*.

The Whole is Greater Than the Sum of its Parts:

The Community Development Division includes the Development Services section. Stephen Richardson is the section Director. Reporting to Ramin Seifi, he has been with the Township since 2010. The instant Stephen read the 2007 collaboration quote by Ramin, he emphatically stated that:

“Inter-department collaboration has continued; and it has been strengthened through the decision to house three groups in one section. My section, Development Services, has three departments - Development Planning, Development Engineering and Green Infrastructure Services. **This integration allows us to cascade from watershed planning down to the site.**”

“Integration leads to efficiencies,” stressed Stephen Richardson. To illustrate his point, he pointed to three piles of documentation around his office, one from each department.

“The purpose in having the three groups within one section is to integrate the pieces of any development proposal. So, in terms of the three professional disciplines represented by the departments, the whole is greater than the sum of its parts. This synergy allows us to catch the pieces that might otherwise be missed.”



Dave Cocking

Manager

Green Infrastructure
Services Department,
Development Services

Integration: It's Embedded in the Culture

"We are nimble because we are integrated," stated Stephen Richardson with pride. "Langley Township is the fastest growing municipality in the Metro Vancouver region. Anticipating and responding to growth requires nimbleness on our part."

"Our integrated process results in a better community," continued Dave Cocking, Manager of the Green Infrastructure Services department and a career employee of the Township. "In turn, this attracts people who want to be here."

"Thus, Langley Township is clearly a *community of choice*," added Stephen Richardson.

TIME PROVIDES PERSPECTIVE

"When I started my career with the Township, we did not deal with complexity. We only dealt with subdivisions.

"As development became more complex, greenways and rain gardens came to the forefront.

"Development engineers now had a greater understanding of nature. No longer was it just greenways. It was also rainwater management.

"Today it is green space altogether such that Langley is a place where people want to live.

"The whole is greater than the sum of the parts. Site development is integrated. The components inform design. As a result, people gravitate to these places"

What Integration Looks Like: During the interview, and to illustrate his concept of integration, Stephen Richardson pointed to the people walking back and forth past his office (which has a full width and floor to ceiling window view).

"Harmony and integration are embedded in the Township culture," he said. "Those individuals walking by my office are interacting with individuals in other groups. They are not exchanging written memos. The structure sets the framework for the culture, and this enables individuals to advance our core principles.

"The driver for integration is to protect and enhance environmental quality. Yes, we do walk the talk.

"As well, support for integration comes from Langley's elected representatives," emphasized Stephen Richardson. "In short, **harmony and integration is what we do.**"

Whole-System Thinking: "The infrastructure we build today is integrated," explained Dave Cocking. "**We recognize that each part is a component of the whole.** We strive to make all the parts work together without compromising any component.

"Working together, we are solving community design issues. We have a shared goal – improve the community and provide amenities. This requires integrated thinking. Everyone contributes."

"Green infrastructure is an equal component," added Stephen Richardson. "This is how we think."

‘Convening for Action’ means...

“Use what we have learned so that we can take action and make a difference in our professional lives. That difference is to change the way we develop land.”

Context statement by Ray Fung, representing the Green Infrastructure Partnership, at the start of the 2007 Showcasing Innovation in Langley event

Integration: How it is Embedded

During the interviews with staff, their explanations of process made it clear that the Township is a living demonstration of adaptive management in action. The essence of the adaptive approach is to ‘learn by doing’ and to change direction when there is a better way.

The 2007 showcasing series focussed attention on the **BC process for ‘convening for action’**. Illustrated below, the 4-phase process is incremental. It requires time and commitment. The hardest gap to bridge is that between WHAT and SO WHAT. The Township has done that, and has gone full circle.

Convening for Action in Langley: “Technical teams input to long-range planning,” stated Stephen Richardson. “There is a constant feedback loop. We raise the bar each time through an iterative process. This strengthens standards of practice. The continual enhancements are reflected in our neighbourhood plans.

“The structure is set up to support good ideas of an integrated nature so that staff can flourish in the work environment. It is a team approach. Staff share and learn from each other.”

1. WHAT is the issue?

The form of land development impacts how water is used, how water runs off the land, and how water reaches streams

2. SO WHAT can be done?

Influence practitioners to ‘design with nature’



4. THEN WHAT?

Replicate and adapt in other neighbourhoods

3. NOW WHAT can we do?

Embrace share responsibility, learn by doing and establish precedents

Green Approaches to Neighbourhood Development

The New Normal

The 'blue link' in the photo below is the new drainage standard in Langley. It replaces the traditional curb-and-gutter detail for all but arterial roadways. The **blue link** is symbolic of the transformational change which has taken root in the Township over the past decade-and-a-half as **designing with nature** has become the 'new normal'.



Yolanda Leung
Landscape Design
Coordinator

Green Infrastructure
Services Department

“There has been an evolution in our thinking and in our approach as successive neighbourhoods have been developed.”

*“In the beginning, our focus for Green Infrastructure was on what we could achieve within **greenways**. Then our attention turned to **rain gardens**. Building on a history of successes, we are now implementing what the Township describes as **blue links**.”*



Manage Neighbourhoods within a Drainage System Context

Green Infrastructure Services, as one of three departments within the Development Services section of the Community Development Division, is responsible for rain garden implementation through the development approval process.



Al Neufeld

Manager

Parks Administration,
Design & Development

“Green Infrastructure Services had its genesis in parks and open space design.

“Splitting the function and creating a dedicated group within Community Development meant we could focus on innovation regarding green approaches to neighbourhood development.”

Neighbourhood Technical Teams: Because Al Neufeld was involved in the early stages of rain garden implementation and establishment of the Green Infrastructure Services department, he has an informed perspective on how green infrastructure has evolved in Langley to become the Township’s standard practice:

“Langley is planning neighbourhoods based on catchment areas. This means managing each as a system,” emphasized Al Neufeld in an interview.

“Green Infrastructure Services promotes, encourages and provides for the translation of broad goals and objectives as outlined in the municipality’s Sustainability Charter, to practical applications as part of development proposals.

“Through the community and neighbourhood planning process, multidisciplinary teams collaborate in Neighbourhood Technical Teams to integrate the landscape architecture, planning and engineering perspectives. The site-specific designs are reviewed for coordination by all three departments within the Community Services section.”

Learn by Doing & Adapt: “To date (from May 2006 to October 2016), an estimated 3100 lineal metres of rain gardens have been handed over from developers for maintenance by the Township of Langley and by property owners that front rain gardens,” reported Yolanda Leung.

“Many more hundreds of metres of rain gardens are under design and under construction. We are learning by doing. In this way, we refine expectations for the finished product. The designs are more refined and the level of coordination for rain garden design and construction has improved.

“A driver for this ongoing evolution is the incorporation of habitat compensation for the fisheries resource.”

Representative Rain Gardens

68A Avenue
cul-de-sac



208A Street
near 69A Avenue



206 Street
near 69 Avenue



Whole-System, Water Balance Approach

Protecting Langley's Groundwater

The Township has a strategy to deal with a host of issues and challenges that impact on the sustainability of its groundwater supply, including:

- Increasing population and intensification of land use
- Growing demand on water resources
- Highly vulnerable aquifers
- Dropping groundwater levels
- Dropping baseflow levels
- A changing climate & a new normal of extremes

Demonstrate How to Implement

This part of the Langley storyline focusses on the overall context for integration of multidisciplinary perspectives and implementation of green approaches to neighbourhood development. Briefly:

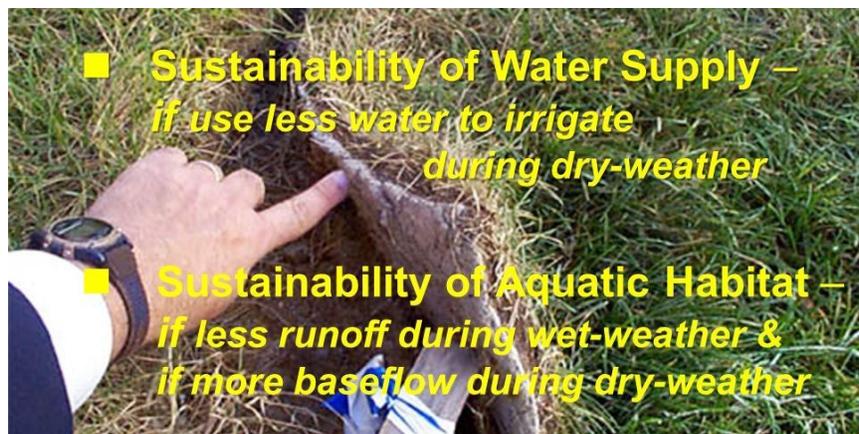
- In 2002, *Stormwater Planning: A Guidebook for British Columbia* established a new direction for drainage engineering. This is known as the Whole-System, Water Balance Approach.
- As the last 15 years show, it is a multi-year process to develop and evolve methodologies and tools, create educational resources, and establish on-the-ground precedents to support **the transition to science-based practice.**

Throughout this period, the Township has established important precedents that demonstrate how to implement the Whole-System, Water Balance Approach. Sharing this experience would inform implementation of science-based changes in practice in other parts of the Georgia Basin and beyond.

Function of Soil: The showcasing event featured Township innovation in green development and groundwater protection. The graphic below illustrates how soil connects the two. **A key message is that the Whole-System, Water Balance way-of-thinking encompasses both the drainage and water supply functions.**

Connect the Dots:

Soil depth is a water management tool. Soil is the interface between rainwater and drought management. Soil is a sponge that absorbs water when it rains. And when there is no rain, the soil sponge supports plant growth plus the horizontal movement of water via the interflow system to streams.





Jim Dumont

Engineering
Applications Authority
Partnership for Water
Sustainability in BC

“Langley is unique in that DFO (Department of Fisheries & Oceans) approved the water balance strategy at a neighbourhood scale for each of Routley, Yorkson and Northeast Gordon.

“This meant that design standards were applied uniformly across each neighbourhood. This was a time-saver for everyone. The approach resulted in consistency of implementation.

“The online Water Balance Express, a tool for use by homeowners, is a natural progression of this experience. The tool would enable easier implementation of water balance requirements.”

Jim Dumont is the engineer of record for the Routley, Yorkson and Northeast Gordon water balance implementation plans

Leaders by Example

The Township was an early adopter of the Guidebook philosophy, and was one of the first municipalities to apply the **Water Balance Methodology**. The methodology provides the technical foundation for the Whole-System, Water Balance Approach. In 2005, the Township became a partner in the Water Balance Model initiative.

Three neighbourhoods in the Willoughby Development Area - Routley, Yorkson and Northeast Gordon Estates - established successive provincial precedents that informed the evolution of the Water Balance Methodology.

Green Infrastructure Precedents: Each neighbourhood features a different innovation in order to ‘design with nature’:

- **Routley:** A multi-purpose greenway and shallow infiltration systems on individual properties.
- **Yorkson:** A third-pipe system for roof drainage connects to a sand filtration treatment system, with provision for future deep-well injection for aquifer recharge.
- **North East Gordon Estates:** Truly ‘green’ streets!

These three neighbourhoods allowed the Township to *learn by doing and adapt*. Staff continue to build on this early experience.

Water Balance Methodology: As understanding has grown, the Water Balance Methodology has evolved; and this is reflected in the successive rainwater management plans for the Routley, Yorkson and Northeast Gordon neighbourhoods.

In 2003, Routley showed that something could be done to protect the fisheries resource. The Routley experience demonstrated how to reduce rainwater runoff volume. It pre-dated East Clayton in Surrey. **Routley was the first application of the Water Balance Methodology in its original form** as laid out in the Guidebook.

Yorkson was the first application of the Water Balance Methodology **as it evolved after 2003 to incorporate flow-duration**. This is important because the critical parameter for stream stability is the number of hours per year of erosion-causing streamflow rates. The flow-duration relationship is the cornerstone of the methodology.

Looking Ahead



Ramin Seifi, P.Eng.
General Manager
Engineering &
Community Development

“A presentation many years ago by Patrick Condon put me on the path to integration. Patrick’s storytelling made me realize that everything we do has an effect somewhere else.”

Cathedral Thinking

The Township has created a working environment which has resulted in a *culture of doing* that supports champions and encourages innovation. “Our success belongs to everyone,” stated Yolanda Leung.

“The dual role played by Ramin Seifi is an essential ingredient in our success,” stressed Stephen Richardson. “As General Manager for both engineering and community development, Ramin enables organizational integration, horizontally and vertically.”

Stephen’s perspective is echoed by Kevin Larsen, Manager for Water Resources and Environment. He too reports directly to Ramin Seifi. “The dual portfolio is a good thing. This works better than having separate general managers.”

A Conversation with Ramin Seifi: “What Patrick Condon said in his presentation was eye-opening and oh so impactful,” recalled Ramin Seifi. “Patrick inspired me to think about HOW we could integrate departments and disciplines in order to have a holistic view of our community; and then, HOW to implement a vision that would be self-fulfilling and self-sustaining over time.”

NOTE TO READER: *Patrick Condon is the former James Taylor Chair in Landscape and Liveable Environments at the University of British Columbia.*

Cathedral Thinking



We can learn from our ancestors.

The builders of great cathedrals in medieval times thought in terms of multiple generations carrying out their work, to complete a dream that would not be realised until long after the originator’s death.

The foundation for Cathedral Thinking:

A far-reaching vision, a well thought-out blueprint, and a shared commitment to long-term implementation



Growth is a Driver for Integration:

“At an average rate of between 2.5% and 3% per year, the Township is the fastest growing municipality in the Metro Vancouver region. As currently projected, Langley’s population could potentially double within the next 30 years.”

“While exciting, this rapid rate of growth creates ongoing challenges in trying to mimic nature when we are developing new neighbourhoods.

*“We have learned from our past experiences, as we implement new measures, and the Township is still very much on the **Harmony & Integration** path.*

“It will take decades for this way of thinking to be instinctive and accepted by everyone in the community, not just the development industry and Township staff.”

Ramin Seifi
July 2017

Making the Case for Integration: Ramin Seifi is an integrator. He has been with the Township since 2000.

“When Colin Wright retired in 2011, our Chief Administrative Officer listened when I presented the case for doing both jobs. The Township needed more integration to respond to the demands on infrastructure and the risks to the environment resulting from rapid population growth. Achieving integration depended on the Township having a better structure,” explained Ramin Seifi.

“A benefit in having a single individual responsible for both the engineering and community development portfolios is that I do not have to argue with myself to get buy-in for implementing a necessary change in standard practice,” chuckled Ramin.

“Replacement of curb-and-gutter with a **blue link** rain garden is a perfect illustration of integration in action. Everyone could see that it made sense. Because I could see the need from all angles, I said to staff **‘just do it’**. Integration helps everyone get it.”



Going Beyond Staff: “The adaptive process for implementing green infrastructure is ongoing. Each time we learn. We strive to find better ways to mimic nature and protect the natural water balance in Langley’s watersheds,” continued Ramin Seifi.

“But the public does not see integration. This means the next step is to educate the community as a whole so that everyone understands the importance of green infrastructure and protecting the water cycle. Buy-in has to be from everyone.

“Time is of the essence to get buy-in, especially with the population currently projected to double. People are attracted to Langley because it is a *community of choice*. **Protecting the natural values that make Langley attractive underscores the importance of going beyond staff to inform and educate homeowners.** Achieving this outcome will require that we go door-to door.

“The Township’s Subdivision Control Bylaw has been updated over the past 10 years. The tree replacement requirement is a notable addition and illustrates the educational goal. We will be successful when homeowners understand the need for and the benefits of trees, and will therefore value them,” concluded Ramin Seifi.



The New Paradigm: Watersheds as Infrastructure Assets

*A watershed is an
integrated system.*

*Rainfall reaches streams
via three water balance
pathways.*

*These pathways are
“infrastructure assets”.*

*The pathways provide
“water balance services”.*



Kevin Larsen, P.Eng.
Manager

Water Resources & Env.,
Engineering Division

*“An example of whole-system
thinking is our approach to
detention ponds. We are not
just detaining water. This is
but one component. There
are multiple aspects
including environment,
operational considerations,
and community amenities.”*

Sustainable Watershed Systems, through Asset Management

“Whole –system thinking is part of our culture,” stated Kevin Larsen. As Manager, Water Resources and Environment, his engineering responsibilities encompass all aspects of the water cycle vis-à-vis planning and constructing municipal infrastructure. His scope of work includes waterworks, sewerage and drainage. During the interview, he provided examples of whole-system thinking.

“Water Resources and Environment staff interact with the Green Infrastructure group on development applications. A major focus, however, is to ensure water supply for our growing population. The more that we can reduce water use during the summer when use increases by 50%, the more we can defer engineered infrastructure to be more sustainable and save considerable dollars.

“As for a changing climate, and considering the ‘new normal’ of alternating floods and droughts, the Water Resources and Environment department is in the front lines.”

Asset management has traditionally been about hard engineered assets such as waterlines, sanitary and storm sewers. Kevin Larsen recognizes that watershed systems are also “infrastructure assets”.

Sustainable Service Delivery: Released by the Province and Union of BC Municipalities in 2015, *Asset Management for Sustainable Service Delivery: A BC Framework* establishes expectations for local government financial sustainability. Moreover, it sets a strategic direction that would refocus business processes on outcomes that **reduce life-cycle costs and risks**.

“The Township is implementing a life-cycle approach to valuing and managing our hard engineered assets,” stated Kevin Larsen.

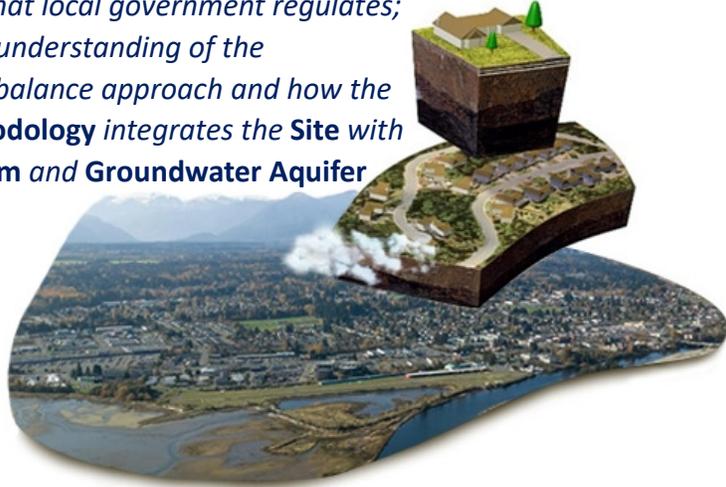
As conceptualized on the next page, a future next step would be to extend the life-cycle approach to include valuation of the services provided by watershed systems. Given its record of water balance and green infrastructure innovation, Langley is poised to make the transition to *Step Three* (integration of natural assets thinking and climate adaptation) on the Asset Management continuum.

Desired Outcome: The community benefits of a Whole-System, Water Balance Approach include: **AVOID** an unfunded liability (by limiting stream erosion, preventing flooding, improving water quality), **ADAPT** to a changing climate, and **REDUCE** life-cycle costs for drainage infrastructure.

In 2017, an educational goal in British Columbia is that those involved in land use and drainage would understand the vision for.....

Sustainable Watershed Systems, through Asset Management³

Applies to land uses that local government regulates; and is founded on an understanding of the whole-system, water balance approach and how the **Water Balance Methodology** integrates the **Site** with the **Watershed, Stream and Groundwater Aquifer**



³ <http://waterbucket.ca/rm/category/sustainable-watershed-systems/>

Asset Management Continuum

Asset management for sustainable service delivery occurs alongside associated evolution in community thinking. It is a continuous quality-improvement process, and incremental.

A local government would experience the asset management process for sustainable service delivery as a continuum leading to a water-resilient future.

Sustainable Watershed Systems would be the outcome in Step Three



Asset Management Continuum for Sustainable Service Delivery

GROUND ZERO: In the beginning, no Asset Management Plan exists. A consequence is 'unfunded infrastructure liability'.

STEP ONE: Local governments embrace the BC Framework, with an initial focus on core engineered assets (water supply, sewage, roads) and embark on an Asset Management Strategy / Plan / Program process.

STEP TWO: Local governments start thinking holistically and implement a life-cycle approach to infrastructure decision-making so that Sustainable Service Delivery for engineered assets becomes standard practice.

STEP THREE: For drainage function, local governments will integrate natural systems thinking and climate adaptation into asset management and account for the Water Balance Services provided by watershed systems.

As understanding grows, local governments will progress incrementally along the Continuum

logo for 'Asset Management for Sustainable Service Delivery: A BC Framework'

THE OUTCOME: A Sustainable Watershed System!

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