

Greater Vancouver tries new approach to sustainable development planning

By Crystal Campbell and Dana Soong

Greater Vancouver's population is projected to grow from 2.2 million (2006 census) to 3.4 million by 2041. This puts incredible pressure on local governments to meet development needs, while maintaining the liveability of their communities and protecting the environment. The City of Coquitlam's yet-to-be-developed Partington Creek town centre in British Columbia is an example of a new approach to sustainable development planning.

The Partington Creek watershed is an undeveloped and ecologically rich watershed located on Burke Mountain in Coquitlam. Most of its 625 hectares are covered by diverse second-growth forest. Partington Creek is one of the last ecologically healthy streams in Metro Vancouver, a prolific salmon spawning stream and home to many aquatic species-at-risk such as white sturgeon, Dolly Varden and coastal cutthroat trout. Black bear, mule deer, river otter, mink, and great blue heron are frequently observed in the watershed, and terrestrial species-at-risk such as the Pacific Water Shrew are found in the riparian zone surrounding the main channels.

As part of Metro Vancouver's Regional Growth Strategy and Coquitlam's Official Community Plan, the lower third of the Partington Creek watershed is planned for greenfield development. Over the next 20 years, what is now forested land will become a new town centre, home to about 12,000 people.

Development objectives and approach

Coquitlam's goal was to create a sustainable, economically viable, and low-impact development that would preserve the natural creek system and environmental values in the Partington Creek watershed. To accomplish this, watershed planning, land development planning, and financial modelling were conducted concurrently. This deviated from the current approach to land development, which is to first develop land use plans and then engage civil engineers to



The Partington Creek watershed is mostly covered by second-growth forest and has sparse rural development.

mitigate the impacts of development.

Such a reactive approach limits the mitigation opportunities and solutions available. The end result has often been inadequate and costly mitigation plans, and urban developments that significantly harm adjacent watercourses and their aquatic life. In the case of the Partington Creek development, engineers, planners, and financial analysts were able to develop plans that not only provide a high level of environmental protection, but also meet the financial and sustainability objectives of the project.

Collaborating to create better outcomes

The project proceeded in several phases and involved extensive stakeholder consultation, as well as the concurrent preparation of an Integrated Watershed Management Plan (IWMP) by lead engineering consultant, Kerr Wood Leidal Associates, and a Neighbourhood Plan (NP) by lead planning consultant, HB Lanarc. Raincoast Applied Ecology provided environmental services to both studies.

The study groups collaborated with each other and with stakeholders to develop watershed and neighbourhood plans with common goals. Stakeholders

included City departments, regulatory agencies (Fisheries and Oceans Canada, BC Ministry of Environment, and Agricultural Land Commission), environmental groups, developers, and local residents.

New topographic survey information revealed a network of small, seemingly insignificant watercourses located under the proposed town centre. They were, in fact, a network of ephemeral headwater streams that provide an important food source to downstream aquatic life. The IWMP study team recommended that the proposed town centre be moved to better protect the watershed's ecology. Because engineering, land use, and financial decisions were being made concurrently, the planners could respond to this recommendation. In fact, the engineering and environmental recommendations of the IWMP team had such a profound effect on the land use planning process that planners redrafted the land use plan.

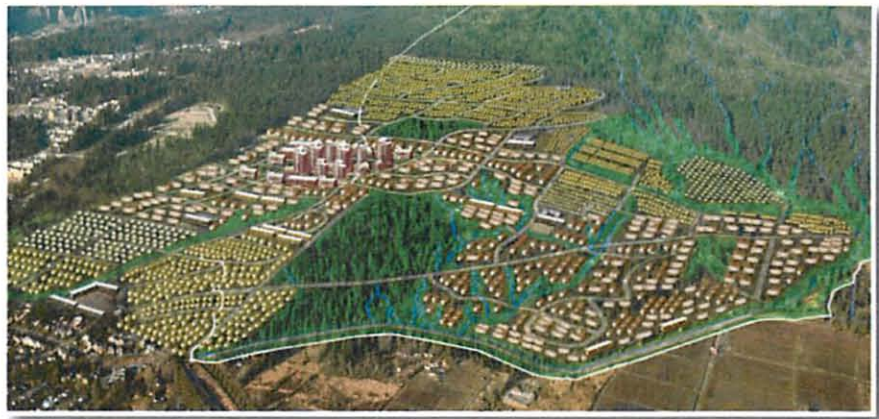
To address environmental concerns, planners moved the village core to the east and modified land use densities. Collaborating with engineers, planners increased the proposed building heights and forms, and the scale and intensity

of the development, so that more space could be set aside for environmental protection and sustainable infrastructure. Land use designations were redrafted and refined, and road layouts amended to strategically minimize impacts to Partington Creek and optimize stormwater infrastructure.

In areas where source controls could not be implemented, engineers incorporated underground baseflow augmentation facilities, which will mimic the natural hydrologic processes in a watershed and sustain aquatic life. This new technique uses water quality treatment facilities, underground storage facilities, and specialized flow splitters so that baseflows, low flows and flushing flows continue to the natural creek system. Excess impervious area flows are conveyed by a diversion pipe to the Deboville Slough at the mouth of Partington Creek, where excess energy is quickly dissipated.

Unlike surface ponds, which are common practice in stormwater management and are heat sinks that can warm creeks to fish-harming levels, these underground storage tanks will keep water temperatures cool for fish. The land area above them can be used for practical and recreational purposes.

Collaboration among disciplines enabled the City of Coquitlam to implement measures that will best protect the watershed as a whole. For example, the



A 1.5 billion greenfield development, future home to some 12,000 people, is being planned for the lower third of the Partington Creek watershed.

IWMP will allow some losses in a less sensitive tributary, Star Creek, in favour of bolstering and enhancing the best fisheries habitat areas on the main stem of Partington Creek. The main stem will be enhanced by moving a 1.5 km section of road 30 metres away from the creek channel to accommodate channel works and create a riparian corridor.

This has multiple benefits such as floodplain creation, an increased sediment management area, increased riparian setbacks, and instream complexing. Floodplain forest and marshes will be created. The works will benefit all aquatic species, with the greatest benefit to the

spawning habitat for chum salmon.

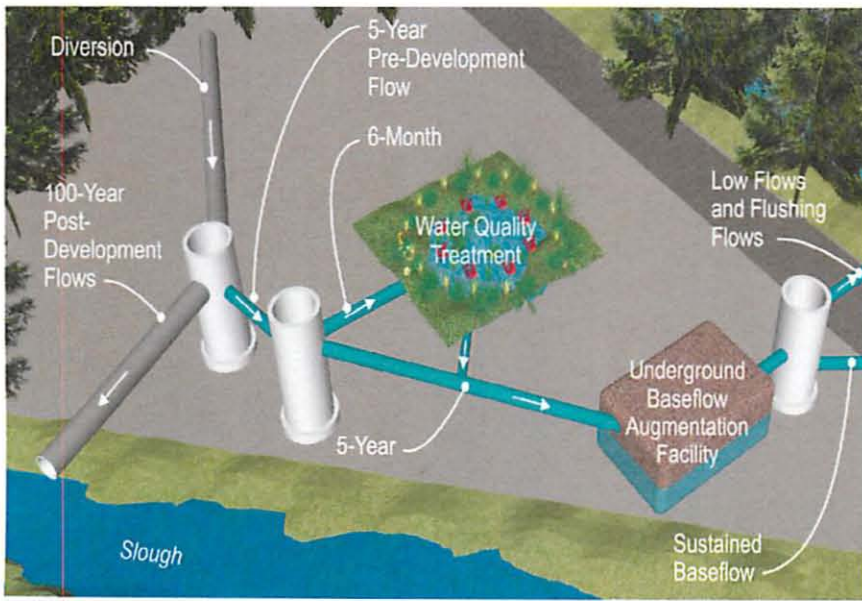
Sustainability and financial objectives met

By using this progressive approach of iterative collaboration among planning, engineering, environmental and financial professionals, and stakeholders, it was possible to create a more sustainable and economically viable community. The resulting development will reflect stakeholders' most strongly desired outcomes for the watershed, which include protecting watercourses, and maximizing forest cover, green spaces, and conservation areas.

This will be accomplished while still meeting the financial objectives of the development and preserving the development's pro forma. By creatively changing the land use to accommodate environmental objectives, the City's population plan was maintained and its development cost charge (DCC) revenue preserved. The total value of the development once built out will be approximately \$1.5 billion. The \$30 million in stormwater management and environmental enhancement works are fully funded through DCCs.

This project received an Award of Excellence from the Association of Consulting Engineering Companies – British Columbia in 2012.

Crystal Campbell, P.Eng., is with Kerr Wood Leidal Associates. E-mail: ccampbell@kwl.ca. Dana Soong, P.Eng., is with the City of Coquitlam. E-mail: dsoong@coquitlam.ca



New and innovative baseflow augmentation facilities and diversions with flow splitters will mimic natural creek flows. These will be located underground.