



**2009 | Brownfields**  
**City of Victoria**  
**British Columbia**  
 Population: 78,057



## *Dockside Green, Phase 1*

### Summary

The Dockside Green development has served as a demonstration model for many innovative measures and has influenced Victoria's future land-use policies. The City of Victoria chose co-developers Windmill West and Vancity to turn a large, centrally located brownfield site into a model of sustainable development and urban intensification (managing growth by increasing density within an existing urban area). After cleaning up the contaminated site, the developers took an integrated approach to designing the energy, water, sewage and waste management infrastructure to ensure maximum synergy and efficiency. They built four detached buildings on the site, all of which meet LEED Platinum standards for energy efficiency. Water is conserved by treating and reusing sewage water for irrigation and toilet flushing. A combination of green roofs, bioswales (landscape elements that remove pollutants from water) and a naturalized creek work to manage stormwater. A comprehensive transportation strategy and an on-site biomass heating plant reduce greenhouse gas (GHG) emissions. Adherence to LEED building standards has reduced energy use by 53 per cent and potable water consumption by 67 per cent, compared to traditional developments. Ninety-five per cent of construction waste was diverted from landfill. Phase One of the project created 200 construction jobs.

### Background

Dockside Green is being developed on 15 acres of former brownfield land purchased by the City of Victoria from the Province of British Columbia in 1989. Several previous attempts to develop the site were unsuccessful because of high remediation costs, but the land has always been considered a high priority for redevelopment because of its size and its central location next to the waterfront and Victoria's downtown core.

While the population of the City of Victoria (about 78,000) is still that of a smaller city, more than 325,000 people make their home in the Greater Victoria area — a significant increase from just 148,000 in 1961. The figure is expected to approach 400,000 by the year 2020, making the responsible management of growth a key priority. The city and its planning and development department have committed to the "triple bottom line" concept of balancing economic prosperity, social development and environmental sustainability in all municipal activities.

The city's long-term goal is to encourage more growth in its centre through urban intensification and brownfield redevelopment. The Dockside Green project was an opportunity to develop existing brownfield lands sustainably based on triple bottom line principles. The municipality also wanted to maintain the industrial sector adjacent to the dockside site, keeping it close to the downtown core and thus limiting sprawl.

### Project Development

In September 2004, the City of Victoria issued a request for proposals (RFP) for development of the dockside lands. The RFP process was innovative in its incorporation of triple bottom line principles. The City of Victoria chose Windmill West and Vancity as co-developers for the site and sold the property to these private developers, who formed Dockside Green Limited Partnership. The city chose these developers because of their integrated, holistic approach to energy, water and resource management. This systems approach focuses on breaking down traditional silos between developers, municipalities, utilities and individual municipal departments. The approach helps the various parties work together to maximize energy savings and efficiency.

The entire project team developed and endorsed a set of goals at the onset of the project, with responsibility for specific goals assigned to specific team members. The team sought advice from Natural Resources Canada, BC Hydro, and the

provincial ministry of energy regarding renewable energy and efficiency measures. B.C.'s Ministry of the Environment helped with the approval process for both the wastewater treatment plant and site remediation.

Dockside Green has given many local businesses the opportunity to showcase green technologies, and has nurtured relationships with the local chamber of commerce and several non-profit organizations interested in sustainability. The broader community has been able to give ongoing input to both the city and the developer throughout the process. A community liaison committee meets quarterly to ensure open communication and support.

## Project Implementation

Funding from FCM's Green Municipal Fund supported field tests and feasibility studies related to the sustainable redevelopment of the dockside lands. The developers agreed to assume responsibility and costs for site remediation, and the provincial ministry of environment approved the risk assessment approach.

The developers used several innovative remediation strategies suited to the site's specific characteristics. Low-risk contaminated material was treated using vapour barriers, while hazardous waste was sent off-site to be treated through thermal desorption. Thermal desorption works by heating and drying soil materials in a kiln until contaminants are turned into a gas, pushed through a reactor and incinerated. The clean soil was then tested to confirm that it met environmental standards. Once approved, the clean soil was mixed with bio-solids and sent to a reclamation project at the Sunoco copper mine. The remediation efforts also treated an additional 10 tonnes of lead-contaminated soil using a cement-based solidification process.

The completed Dockside Green project will be a mixed-use sustainable community development of 1.3 million square feet, made up of residential, office, commercial and light industrial space. The development adheres to principles of new urbanism: it is a walkable community with access to shopping, services, recreation and transit.

Phase One of the project was completed in September 2008 and includes four detached buildings constructed over a common underground parking structure, a wastewater treatment plant and a partially completed stormwater system. Residential buildings include a mix of apartments, garden flats and townhouses. The buildings constructed in Phase One of the project incorporate a number of sustainable design features that contribute to their LEED Platinum certification. An integrated design process ensured maximum synergy among the various features.

To implement the project, the multidisciplinary team first acquired a thorough understanding of Victoria's key energy, water and sewage management issues. These issues included the lack of sewage treatment in the community, the increasing cost of potable water treatment because of deforestation practices in the watershed, and rising hydro demands caused by the prevalence of electric baseboard and water heating in new residential developments.

The team used passive design to reduce energy consumption. Passive design means understanding how building orientation affects energy performance and including features that maximize energy efficiency in each area of the building.

The overall community layout was designed for energy efficiency. For example, the sewage treatment plant was placed in a location that removes the need for pumping.

The natural environment served as a model for the design of Dockside Green. The developers used creeks and ponds as part of a naturalized approach to treating and retaining water. These features also enhance the ecology and aesthetics of the site.

The developers were able to reduce infrastructure costs by choosing more expensive and efficient water and energy fixtures. For instance, the use of water-efficient fixtures allowed for the downsizing of the required sewage treatment plant by 50 per cent, dramatically reducing capital and operating expenses. With on-site building sewage treatment facilities, treated water can be re-used for irrigation and toilet-flushing. The water-efficient features also reduce the demand for hot water, making more of the heat generated from the on-site biomass plant available for sale to adjacent sites.

Metering systems display hot and cold water usage and heat and electricity consumption, allowing individual residents to track and compare their demands over time. On a larger scale, each infrastructure system will have control and monitoring devices that track the efficiency of the entire community's use of the resource. The performance measurement system will also monitor the entire site's greenhouse gas (GHG) emissions. This is part of a commitment to the Technology Early Action Measures (TEAM) program, a federal interdepartmental technology investment program that supports projects designed to reduce GHG emissions.

An annual, publicly available sustainability report will outline progress toward stated goals. This ensures transparency and helps maintain the support of the local community. The developer and city staff have worked continuously to share information on the innovative aspects of Dockside Green with a broad audience through presentations at international sustainability conferences, by hosting representatives from other municipalities and through participation in the FCM Sustainable Communities Mission.

## Results

- Through a combination of efficiency measures, the Phase One buildings have achieved a 53 per cent energy savings over the requirements of the Model National Energy Code for Buildings (MNECB).
- Reduced energy and water demands have limited the development's impact on municipal infrastructure.
- The completed project will save more than 70 million gallons of water, reducing water demand by 67 per cent, and will not require use of the municipal sewage or stormwater systems.
- Ninety-five per cent of construction waste was diverted from landfill. Twenty-three per cent of the construction materials were locally sourced, and 17 per cent contained recycled materials.
- The project's comprehensive transportation strategy, which includes car-sharing, co-op parking and dedicated bicycle paths and storage facilities, has reduced the amount of vehicle traffic to and from the dockside site. Transportation demand management (TDM) strategies allow the tracking of data on this issue and foster a more efficient use of transportation resources.
- The project contributed to the social fabric of the community. Phase One created 26 market-affordable residential units and seven retail jobs, alongside the 200 construction jobs related to the development.
- In addition to stimulating the local economy, the project included a First Nations training initiative to create opportunities for Aboriginal people.

## Lessons Learned

- **WORK CLOSELY WITH ALL STAKEHOLDERS.** One of the potential risks was that Dockside Green residents would be charged for municipal sewage treatment when they had already contributed to the costs of the on-site system. By collaborating closely with all stakeholders, the team obtained the municipality's agreement not to charge residents for the sewage component of their water bills. Instead, the city will bill for water on a "per-unit" basis to encourage water conservation.
- **USE A SYSTEMS APPROACH.** A systems approach was crucial for identifying synergistic design opportunities for the central heating, sewage treatment and stormwater drainage infrastructures. Innovative aspects such as heat recovery from the sewage treatment process and reuse of treated water can reduce capital and operating expenses but are only successful if utilities, developers and municipalities collaborate throughout the design process.
- **OBTAIN FINANCIAL SUPPORT FOR THE DEVELOPMENT OF SUSTAINABLE INFRASTRUCTURE.** Wastewater treatment plants and biomass systems become economically viable when operating at full capacity. To prevent delays in development of sustainable infrastructure, particularly in the current economic context, the Municipal Finance Authority of B.C., the province's central borrowing agency for the financing of municipal capital requirements, may have a key role to play in supporting these kinds of projects in their early stages.
- **ENGAGE THE COMMUNITY IN THE PLANNING AND DESIGN PROCESS.** The developer worked closely with local community organizations, the non-profit community and local businesses, gathering their input throughout the process. Open lines of communication meant that there was no opposition to development plans at rezoning, community and development permit meetings.

## Related and Future Initiatives

The project's community-building focus indirectly resulted in the rehabilitation of the nearby Point Ellice Park, the building of a dock and a small boat launch, and upgrades to the local bicycle trail. Dockside Green has given the City of Victoria a model for future sustainable development. Inspired by the project, the city is in the process of developing the Victoria Sustainability Framework, which will build on existing planning documents to provide a comprehensive vision for long-term community planning and the greening of municipal operations. The framework will identify existing sustainability initiatives and prioritize areas where further work is needed — areas as diverse as waste collection, procurement policies, bicycle sharing and stormwater management.

## Partners and Collaboration

Dockside Green Ltd. Partnership (Windmill West and Vancity)

City of Victoria

FCM Green Municipal Fund

B.C. Ministry of Environment

B.C. Ministry of Energy

B.C. Hydro

Natural Resources Canada

Vic West Community Association

Victoria Chamber of Commerce

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### Photo Information

Photo Caption: The Synergy building at night: LEED standards for light pollution reduce the development's impact on the nocturnal environment.

Photo Credit: Courtesy of Busby, Perkins + Will / Enrico Dagostini (photographer)