

Getting “Grid Positive, Carbon Neutral and Water Secure” in Colwood: A Brainstorming Session for Land Managers and Developers

Notes from Meeting held August 20, 2008
at Essencia at Esquimalt Lagoon

Fidelis Resource Group



Introduction

This meeting, hosted by the City of Colwood and Essencia at Esquimalt Lagoon, was an opportunity to share ideas on ways that the City of Colwood can work with land managers and developers to achieve its goals of becoming “grid positive” (i.e., a net contributor of energy to the grid); “carbon neutral” (dramatically reducing greenhouse gas emissions), and managing water to reduce demand and retain healthy watersheds. These are goals that the City has set for itself, and many of the approved and proposed developments in Colwood have set similar goals for “green” development.

The purpose of the meeting was:

- To share ideas on practical ways to become “grid positive, carbon neutral and water secure” throughout the community; and
- To identify win-win synergies between the various land and property managers that help to achieve these goals.

A copy of the agenda is provided in Appendix 1.

Attendees included City of Colwood staff, representatives of the local development community, local landholders/land managers, and representatives from the provincial government and Capital Regional District. See Appendix 2 for a list of attendees.

Judith Cullington, meeting facilitator, opened the meeting by encouraging participants to share their vision for Colwood. Many participants expressed wishes such as that Colwood be sustainable; a leader in the country and world; achieve net zero; demonstrate ‘sustainability without borders’; continue to be a fantastic place to live; and to be vibrant socially, ecologically, and fiscally.

Presentations

Michael Baxter, City of Colwood

Michael set the tone for the meeting by outlining Colwood’s interest in this integrated approach. An extract of his comments is included below.

“Colwood has decided to begin an initiative centred on reducing our carbon footprint and therefore our dependence on external energy and other resources and to take this as far as we can figure it out – to the extent of being energy positive if we can find a way to do that – but always without forgetting the many other needs of a community.

An example of what we are doing - this month we will replace a 17 year old gas driven pick-up with an entirely electric vehicle for one of our public works crews – probably the first municipality in the country to do so. We will save money in the first year of operation and every year after that. This solution has just been waiting for us to find it. How many more improvements are available where, by putting together our creative minds, we can work together to both preserve the planet’s current biology, improve quality of life and also save or make money?

We have engaged Fidelis to help us in this endeavour because we have been impressed by their multi-disciplinary approach and by the way they see to the heart of the problem, which includes the money! Sewage treatment may be a central part of the picture as it may be a catalyst for much more than just dealing with wastewater. The Capital Regional District has the responsibility and authority for the treatment of municipal sewage under the current regulation arrangement and we are glad to see them represented here today.

We see a role for private sewage treatment (after all, currently the most effective sewage treatment is done by private individuals in their own backyards) and we see a role for public plants, we see a role for small backyard treatment plants and a role for large plants, in short, we see a role for flexibility. We see a role for everyone that can contribute to the ideas and the implementation of those ideas. Flexibility and creativity and a focus on the heart of the problem are what we need.

This meeting is the embodiment of what we are searching for. Like minded folk, seeking the right outcome for the community, without too much concern for who is actually leading the charge – just a lot of concern for the planet and our community within it, which includes keeping the expenditure of resources to a minimum.”

Dr. Jon O’Riordan, Fidelis Resource Group

Jon explained the origins and goals of the Integrated Resource Management (IRM) study that was commissioned by the Province. He noted the differences between IRM and a more traditional waste management approach, and explained the importance of the business case in applying this thinking. The study completed for the Province was more limited in scope, applying primarily to liquid and solid waste, however the Colwood study allows the Fidelis team to take their thinking more broadly, including integrated energy (geo-exchange, LED lighting, solar, wind); integrated waste (solid, liquid, dry organic, zero waste approach); integrated water (water fit for use, conservation, groundwater recharge, watershed health); and integrated land use (development siting, green space, ecosystem protection and enhancement; neighbourhood LEED).

He noted that there is a perception that IRM increases costs, but this view fails to take account of the greatly increased values (and thus opportunity for net profit). He identified many challenges inherent in the current regulatory process, which favours the status quo and often runs counter to innovation.

A copy of Jon’s PPT presentation is included in Appendix 3.

Cori Barraclough, Fidelis Resource Group

Cori outlined how water works in Colwood, noting that there are relatively few major streams because of the large gravel aquifer. At the base of the escarpment, streams run year-round, fed by groundwater. Groundwater levels have fallen in recent years, and some streams are now dry in the summer, especially during times of drought.

There are many opportunities for water re-use, such as use of treated water to irrigate golf courses, double plumbing for new housing, (mandatory by 2010), stream flow augmentation (public, private collaboration), wetland construction, and habitat enhancement. These measures increase property values.

There are opportunities for restoring the ecological function of a community as a whole, however it is important to think about how to optimize the fiscal benefits as well.

A copy of Cori’s PPT presentation is included in Appendix 3.

Dave Jackson, WorleyParsons Komex

Dave explained how the LEED Platinum certified Dockside Green development has created an on-site wastewater treatment plant (the first in Victoria). All wastewater (black and grey) is treated to a high effluent standard (tertiary treatment), and returned to buildings to flush toilets, etc. Excess treated water augments stream flow through the centre of the development and goes into upper harbour.

The wastewater treatment plant is enclosed in a two-storey, subsurface structure under the walkway. Effluent goes through several stages, including a Membrane Bioreactor that sucks clean water through a series of membranes. Residuals are screened, compacted, washed, and put into bags as a dry cake that can be used in a wood fuel gasifier. There is no odour, as the building is enclosed, and air goes through disinfecting system before being released.

A copy of Dave's PPT presentation is included in Appendix 3.

Andrew Pape-Salmon, Ministry of Energy, Mines and Petroleum Resources

Andrew noted that the provincial government has recommended that all new developments strive to be 'net zero'. The target is to reduce average home energy demand by 20% by 2020. New construction will be the primary target, as not every home can be retrofitted.

Demand reductions can be achieved through design: e.g., passive solar design, south side windows, insulation, deciduous trees, and awnings. A barrier to building energy efficient homes is that typically the developer does not pay energy bills, the homeowner is stuck with it; hence builders design for cost reduction, not energy efficiency. The intent is to address this problem through a transfer pricing mechanism. The Energy Efficient Building Strategy includes several funding programs to support this initiative.

The other part of the equation is to produce clean energy that can be fed into district energy systems, e.g., through geo-exchange. This will be supported through net metering. The Shaw Building uses heat generated by computers to heat residential apartments. Developers are encouraged to build flexible systems that will adapt to tomorrow's energy sources, e.g., a building maybe run on natural gas today, but tomorrow's fuel may be a plasma energy system.

A copy of the publication 'Energy Efficient Buildings Strategy: More action, less energy' is available from www.energyplan.gov.bc.ca/efficiency/.

Roundtable on Local Projects

Local developers and land managers shared information on their actual and proposed developments, especially aspects relating to reduction of water and energy, and use of alternative sources of water and energy.

Essencia (Shawn Ripley)

- Essencia will focus on protecting existing features: this building (Pendray House), Bee Creek, migratory bird sanctuary.
- Proposed technologies include geothermal, solar, water management, heat recovery, building design for towers (small floor plate for energy efficiency). Right from design process.

Olympic View (Jeff Somerville)

- Preservation of greenspace, wetland, use of narrow roads and native plantings
- In process of getting water licence to increase storage for golf course
- Use of low-energy street lights

Aquattro (Ken MacLeod)

- 13 acres of protected land as park, maintained as natural state
- Geothermal for whole project; currently drilling holes at one building, 24 holes to be drilled in total
- Enhancing Selleck Creek as a fish-bearing stream, using groundwater to recharge pond and feed new creek. A separate large pond (not connected to the stream) will be used for irrigation. Stormwater runoff water will be gathered in rain gardens, etc. Don't currently have plans for reuse of water, but hope to in the future.

Royal Roads University (Steve Gundy)

- As educational institution, focus is to make everything a research and demonstration project for the broader community, e.g., greening of heritage buildings. Many challenges, such as heating a large, draughty castle. RRU are less interested in the technological barriers, but keen to identify the social science barriers to integration.
- Are proposing an integrated resource management approach to waste, water and energy, not just for the campus but for community beyond. Currently evaluating expressions of interest for dry waste gasification system, just one component of the overall design. Conceptual work is almost complete and now looking at the business case. They see incredible value to community, will create more energy than they need and can supply community.

Colwood Corners/Turner Lane development (Mir Ali)

- Divide project into three phases, currently in phase one. Objective is to build a 'green city' with building targets for zero carbon, zero waste, zero net energy. Trying to capitalize on examples from other parts of the world.
- Biggest handicap for building a sustainable development is expensive, but it's a mindset. Challenge to make building costs lower, make project cost-effective.
- Discussion of whether Canada is prepared to take advantage of carbon trading and carbon credits, how can we cash in on this phenomenon?

International Chefs Collaborative (Ken Hueston)

- Noted that restaurants have huge energy bills, import large amounts of food, and produce large amounts of food waste. Often they are tenants rather than owners, so more limited in ability to build responsibly.
- Noted need to look at subdivisions, embrace as community for energy resources.

West Shore Town Centre (Annabelle Siminski)

- Under new owner, keen on 'green building' approaches. Needed to make changes to energy use, recycling, waste, hazardous waste, indoor air quality, tenant communication.

West Shore Parks and Recreation (Ron Dietrich)

- WSPR are planning to upgrade old buildings, hoping to bring new technology into old buildings. Already do some heat exchange from arena to pool, looking to expand options.
- Have been identified as a possible site for treatment plants.

Discussion

The discussion period was extensive and engaging. Some of the key concepts and suggestions arising are noted below.

Comments and suggestions:

- If one developer takes the 'low-hanging fruit', the 'high' fruit will fall to the taxpayer. Need to take an integrated approach so that we all win – community and developers. Without integration, one person benefits and others lose. Need to ensure that the values are shared by the development community as well as community at large.
- We are in this together, as a family and community we will survive and thrive. We are not just planning for now, but for the future. It is not just about people, but the ecosystems.
- It is no one person (or agency)'s job to understand how to integrate everything—this is not easy to do. This is a worldwide issue.
- Regulatory approvals can be a huge barrier, creating risk for developers. However, opportunities are huge.
- Geo-exchange involves punching holes in the ground. First nations are concerned about this, and should be consulted as there are many areas sensitive to digging. Use solar and wind first.
- Integrated design is key. For example, simple choices such as incandescent lighting can have impacts on heating/air conditioning loads. How do we ensure that we understand all components and their interactions?
- Need to address integrated resource management at regional scale – which aspects are decentralized, which should be regional or sub-regional (e.g., gasification plant)?
- There is a need for a master energy plan for the community. Need to know how to bring developers together, reform utilities.
- Also need for a 'roadmap' to designing sustainable communities.
- Finding funding for the development of such plans is not easy.
- Having a committee that meets e.g., monthly to discuss this would be very useful. Need to develop a terms of reference for this committee. Could include seeking funding to implement ideas. This committee should be a partnership between the municipality, private sector, academia, with funding from foundations.
- Place waste treatment plants close to markets – e.g., for water. Look at options such as using excess heat from shopping malls to heat nearby residences. Need to map out where there is excess energy production.

- We need to move quickly, sense of urgency and not much time. Keep it focused, do something achievable.

The City of Colwood can:

- Establish this place as a smart green city. Look at how to shine both locally and in the world beyond.
- Push the boundaries for energy etc. requirements. However, note that market is tough and they can only push so far.
- Help to educate development community (and public), push new ideas.
- Create incentives for developers to move towards net zero, etc. Incentives could include density bonus, faster approvals process, delay of DCC payments until occupation.
- Participate actively in development design processes and be an advocate for innovation.
- Find ways to encourage residents to adopt new technologies (e.g., they have applied to Solar BC for solar roofs funding).

Developers can:

- Build flexibility into their developments – e.g., allow for installation of double plumbing at later date.
- Include information on their energy needs, water needs and anticipated waste generation as part of the project information. This will allow City to assemble this information.
- Use IRM as a means to differentiate their developments, market edge.
- Participate in the proposed committee.

The provincial government can:

- Help to bring the missing players into the room, especially Ministry of Health and VIHA re uses of reclaimed water.
- Help provide training/education for trades, consumers. (also groups such as Canada Green Building Council)
- Bring the right people into the room to discuss regulatory barriers and change.

The Fidelis report should include:

- An appendix with 'green resources' e.g., funding sources, government policies.
- A 'roadmap' of who to talk to at various levels of government, who to consult with.

Note: the Lonsdale Energy Corporation in North Vancouver has the longest running closed loop district energy system. They have offered to do a tour of their facilities for all interested. If you would like to participate, please contact Judith Cullington (contact information below).

Next Steps

Fidelis Resource Group will prepare a draft report by early October. This will be circulated to meeting participants for comment if they so desire. The intent is to have a final document ready for presentation to Council before the end of October.

For more information contact:

Judith Cullington
on behalf of Fidelis Resource Group
jcullington@shaw.ca
250-391-8772

Michael Baxter
City of Colwood
mbaxter@colwood.ca
250-478- 5999 ext 111

Appendix 1: Agenda



Getting “Grid Positive, Carbon Neutral and Water Secure” in Colwood: A Brainstorming Session for Land Managers and Developers

August 20, 2008
9:00 am – 3:00 pm

Essencia at Esquimalt Lagoon, 3221 Heatherbell Road, Colwood

This meeting, hosted by the City of Colwood and Essencia at Esquimalt Lagoon, is an opportunity to share ideas on ways that the City of Colwood can work with land managers and developers to achieve its goals of becoming “grid positive” (i.e., a net contributor of energy to the grid); “carbon neutral” (dramatically reducing greenhouse gas emissions), and managing water to reduce demand and retain healthy watersheds. These are goals that the City has set for itself, and many of the approved and proposed developments in Colwood (including Essencia) have set similar goals for “green” development.

The purpose of the meeting is:

- To share ideas on practical ways to become “grid positive, carbon neutral and water secure” throughout the community; and
- To identify win-win synergies between the various land and property managers that help to achieve these goals.

Agenda

- 9:00 am Networking and refreshments
- 9:20 am Welcome and introductions (Judith Cullington, facilitator)
 - Purpose of meeting
- 9:30 am Sharing wisdom: a series of brief presentations on actual and proposed projects for energy and water in this community, including:
 - Colwood’s vision and goals (Michael Baxter)
 - Integrated Resource Management approach (Fidelis Resource Group)
 - Water in the West Shore (Aqua-Tex Scientific Consulting)
 - Dockside Green (Dave Jackson, WorleyParsons Komex)
 - Provincial Net Zero approach (Andrew Pape-Salmon)
- Roundtable on local projects and places.
 Comments, questions and discussion
- 11:15 am An integrated approach in Colwood: what are some of the possibilities?
 - Green communities funding
 - Potential synergies for West Shore – discussion
 - Business implications of an integrated plan (Chris Corps)
- Noon Lunch (provided)**
- 12:45 pm Mini-charettes
Break into smaller groups, look at how this might be applied at the site level, and discuss opportunities for energy and water partnerships.
- 2:30 pm Brief report out from each group
Next steps
- 3:00 pm Adjourn

Appendix 2: Attendees

Local government

Michael Baxter	City of Colwood
Chris Pease	City of Colwood
Alan Haldenby	City of Colwood
Simon Lawrence	City of Colwood
Jon Munn	City of Colwood (pm only)
Jordan Fisher	Colwood consultant
Tony Brcic	CRD
Dan Telford	CRD

First Nations

Charlene George	T'sou-ke (Essencia)
-----------------	---------------------

Developers/landowners/land managers

Steve Grundy	Royal Roads University
Shawn Ripley	Essencia
Mary Krupa	Essencia
Cindy Moyer	Essencia
Randy Royer	Essencia
Mir Ali	Turner Lane
Rob Johnston	Turner Lane
Donna Perrin	Aquattro
Ken MacLeod	Aquattro
Jeff Somerville	Olympic View
Michael Volk	Latoria Walk
Annabelle Suminski	West Shore Town Centre
Ron Dietrich	West Shore Parks and Recreation
Ken Hueston	Island Chefs Collaborative

Provincial Government

Andrew Pape-Salmon	Ministry of Energy Mines and Petroleum Resources
Chris Frye	Ministry of Energy Mines and Petroleum Resources
Cindy Walshe	Ministry of Environment
Jack Bryden	Ministry of Environment

Fidelis Team

Chris Corps	Fidelis Resource Group
Patrick Lucey	Fidelis Resource Group
Cori Barraclough	Fidelis Resource Group
Jon O'Riordan	Fidelis Resource Group
Dave Jackson	WorleyParsons Komex
Judith Cullington	Judith Cullington & Associates
Jen Comer	Judith Cullington & Associates

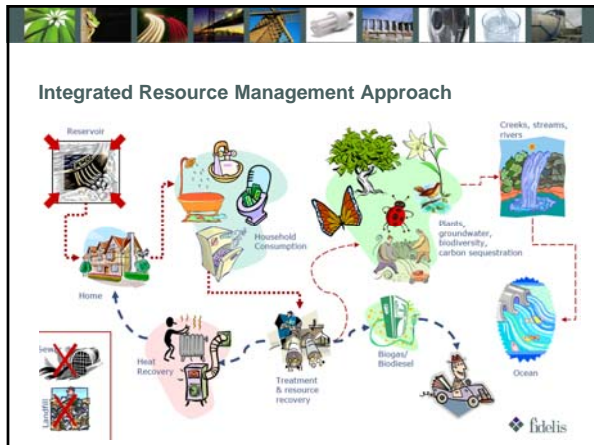
Appendix 3: PowerPoint Presentations



Integrated Resource Management


Application to a 'grid positive, carbon neutral and water secure' Colwood

August 20, 2008
Jon O'Riordan on behalf of Fidelis

Comparison of IRM with Traditional Approaches (1)

Traditional Approach	IRM Approach
▪ Single use	▪ Multiple use
▪ Minimize cost	▪ Maximize revenues
▪ Resources separated	▪ Resources integrated
▪ Large scale systems	▪ Small, distributed systems




Comparison of IRM with Traditional Approaches (2)

Traditional Approach	IRM Approach
▪ Reactive	▪ Proactive
▪ Silo driven	▪ Team driven
▪ Fiscal metrics	▪ Value metrics
▪ Build redundant future capacity	▪ Build for present capacity




Proven Technologies



IRM Version 1.0: Resources from Waste (1)

- Integration of water, liquid and solid waste systems
- Resource recovery—biosolids, heat, energy, nutrients
- Water reuse—conservation, watershed health





IRM Version 1.0: Resources from Waste (2)

- Distributed waste and energy resource centres (WERCs)
 - heat, cooling, energy close to hosts
 - tertiary treated water for watershed recharge, irrigation
- Centralized Digesters
 - wet organic waste
 - bio-solids
- Cogeneration
 - dry organic waste
 - garbage





IRM Retrofit: James Bay example







Business Case

- Highest and Best Use
- Revenues
 - Bio-fuels, energy, fertilizer,
 - Shadow pricing carbon reductions
- Costs
 - Treatment capital
 - Resource recovery capital
 - Operational and maintenance
- Values
 - Real estate
 - Amenities
 - Ecosystem goods and services





IRM Version 2.0: Application to Colwood

- Integrated energy
 - Geo exchange, LED lighting, solar, wind
- Integrated waste
 - Solid, liquid, wet and dry organics, zero waste
- Integrated water
 - Water fit for use, conservation, groundwater recharge, watershed health
- Integrated land use
 - Development siting, green space, ecosystem protection and enhancement
 - Neighbourhood LEED (and beyond)





IRM Version 2.0: Application to Developers/ Land Managers

- Opportunity for synergy with neighbouring developments
- Sources/markets for energy, water
- Market edge/branding/public acceptance
- Cost/revenue?
 - ♦ Competitive advantage





IRM challenges

- Current pricing supports use not reuse
- Control of waste streams
- Perception that IRM increases costs; increased values not considered
- Current bylaws and regulations favour status quo; penalize innovation
- Increased risk factors
- Valuing ecosystem services

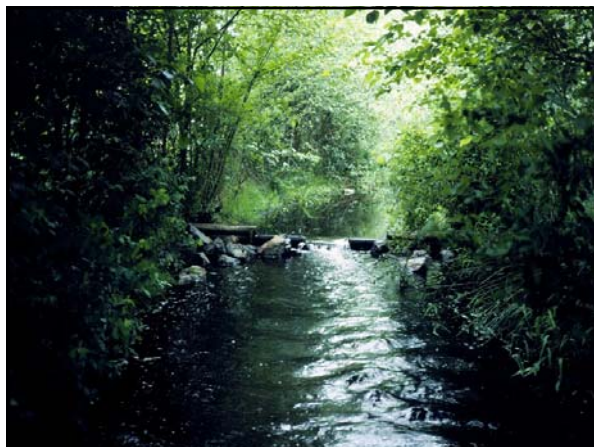
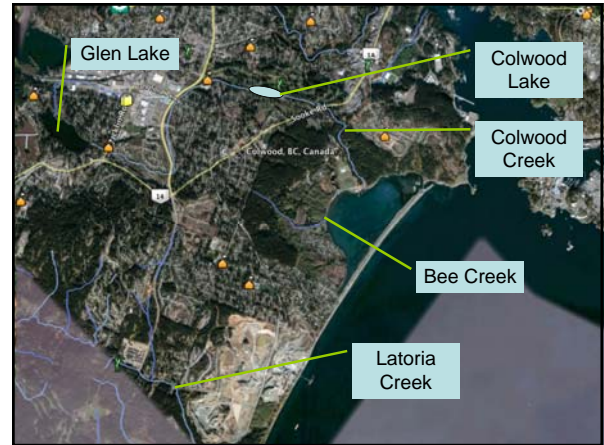
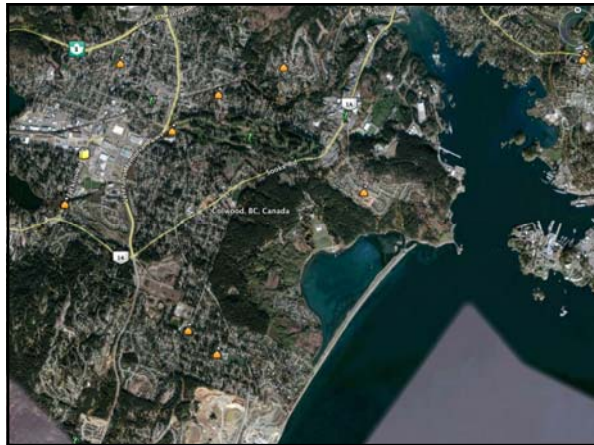
 fidelis

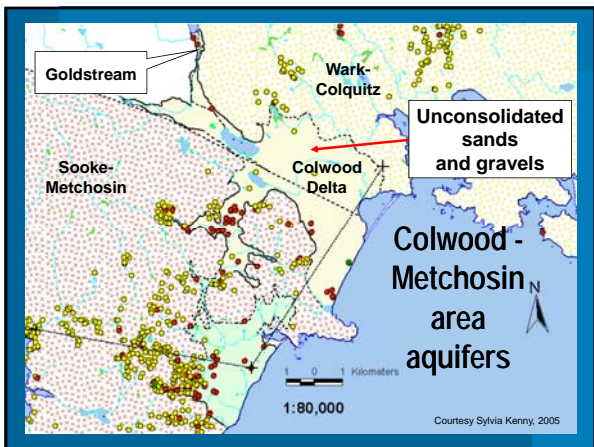
Water Management in Colwood

Cori L. Barraclough, R.P. Bio.
Wm. Patrick Lucey, R.P. Bio.

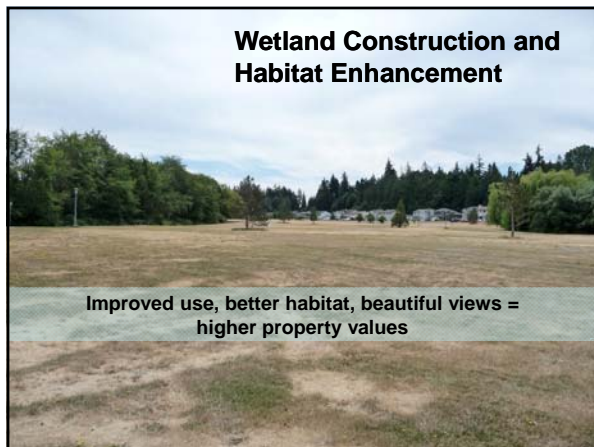
August 20, 2008

- ## Outline
- Streams and wetlands in Colwood
 - Major systems
 - General condition
 - Aquifers
 - Uses for reclaimed water
 - Irrigation
 - Reuse in toilets
 - Groundwater recharge
 - Opportunities for stream and wetland restoration






Opportunities for Water Reuse



WorleyParsons Komex
resources & energy

Dockside Green WWTP – Victoria BC

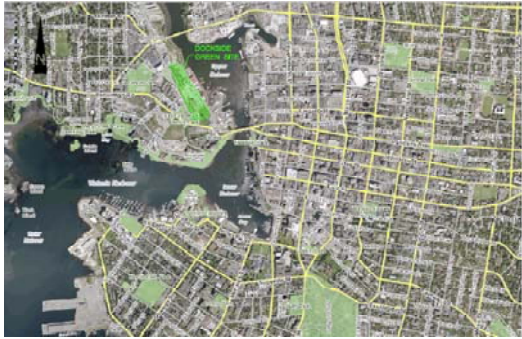
Canada's First LEED® Platinum Development



when possible credit

WorleyParsons Komex
resources & energy

Dockside Green

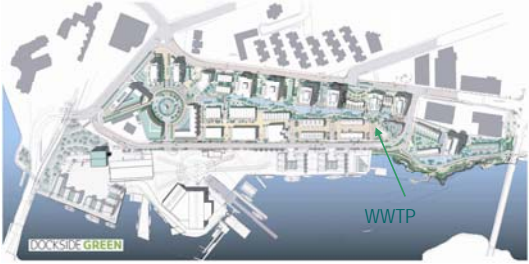


2 2/18/2008 Decentralized_wastewater.ppt

WorleyParsons Komex
resources & energy

Dockside Green

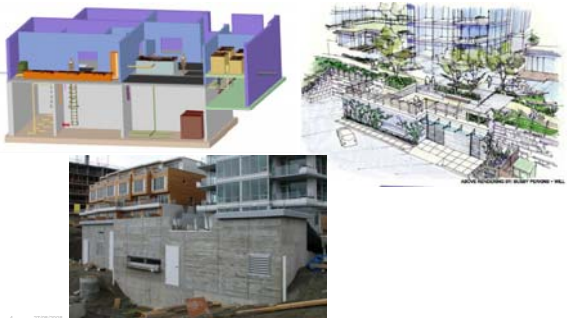
► LEED platinum: mix commercial and residential



3 2/18/2008 Decentralized_wastewater.ppt

WorleyParsons Komex
resources & energy


Dockside Green



4 2/18/2008

WorleyParsons Komex
resources & energy


Dockside Green



5 2/18/2008 Decentralized_wastewater.ppt


WorleyParsons Komex
resources & energy

Dockside Green




6 2/18/2008 Decentralized_wastewater.ppt

WorleyParsons Komex resources & energy Dockside Green



27/08/2008 DocksideGreen_wastewater.ppt

WorleyParsons Komex resources & energy Dockside Green




7 Treated water can be reused for landscape irrigation, constructed waterways, toilet flush water and for laundry facilities.

www.docksidegreen.com


27/08/2008 DocksideGreen_wastewater.ppt

WorleyParsons Komex resources & energy Membrane Bioreactor (MBR)




27/08/2008 DocksideGreen_wastewater.ppt

WorleyParsons Komex resources & energy Residuals




27/08/2008 DocksideGreen_wastewater.ppt

WorleyParsons Komex resources & energy Odour Control




27/08/2008 DocksideGreen_wastewater.ppt



WorleyParsons Komex resources & energy Effluent Quality




27/08/2008 DocksideGreen_wastewater.ppt

 **WorleyParsons Komex**
resources & energy

Decentralized Wastewater



13 27/08/2008 Decentralized_wastewater.ppt

 **WorleyParsons Komex**
resources & energy

Lessons from Dockside

- ▶ Practical example of distributed wastewater management and resource recovery
- ▶ A WWTP can be a good neighbour!
- ▶ Water Reuse and *Energy Recovery*
- ▶ High effluent quality can allow unconventional discharge options

14 27/08/2008 Decentralized_wastewater.ppt