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Response to Request for
Expressions of Interest

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Innovative Sewage Treatment and Resource Recovery Technology

Victoria, BC, Canada
Wednesday, January 31, 2006



**BUSBY
PERKINS
+ WILL**

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Capital Regional District Request for Expressions of Interest Regarding
Innovative Sewage Treatment and Resource Recovery Technology for
Victoria, British Columbia, Canada

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1.0 LETTER OF INTEREST

Further to the announcement of the Request for Expressions of Interest posted on the BC Bid website, we are pleased to express our keen interest to provide consulting services regarding the Innovative Sewage Treatment and Resource Recovery Technology and Strategies for BC's Capital Regional District.

We are deeply committed to creating a sustainable future for the communities of the Capital Regional District and in helping to set a new benchmark for infrastructure development world wide. To accomplish this, we must fundamentally change the way we circulate water, energy and waste through our built environments. While unpalatable, sewage is not toxic waste. It is rich in energy and biological nutrients and, handled appropriately, is a valuable resource that can produce reverberating benefits for the citizens of the Capital Regional District. A treatment system is not an obligation, it is an opportunity.

It may seem unusual to receive an approach led by an architecture and planning firm; engineers normally take the lead on large infrastructure projects. The Request for Expressions of Interest document asked for innovative "sewage treatment and resource recovery technologies that will maximize environmental, social and economic benefits to the community."

We challenge the idea that any technology, no matter how revolutionary, can maximize these benefits on its own. Innovative technologies are a crucial component of the solution, but they are only one component of many that must come together to produce the benefits the communities of the CRD deserve. What is required is an integrated design approach that considers the totality of the flows and exchanges of the urban water and energy pattern, as well as the relationship of infrastructure systems to the other elements of the city they serve. A revolutionary plant that no one wants to live beside will still lower the value of adjacent properties and minimize economic benefits. A single-use plant will create a dead zone in the urban fabric, reducing the cultural vitality of the community minimizing social benefits. And, a centralized plant will continuously waste energy conveying sewage against gravity, minimizing environmental benefits.



There are many proven energy harvesting, non-polluting technologies that can help create a vibrant sustainable future for the communities of the Capital Regional District. They must be organized, however, into a coherent system that does not work against existing natural forces and adds vitality and value to the communities it serves. This is not unattainable. We have a strong track record of transforming degraded sites, and the districts that surround them, into healthy, liveable neighbourhoods. Our long standing commitment to sustainability and integrated design team approach means that we have always been focused on improving the energy pattern and optimizing valuable resources such as water and energy. Our enormously successful Dockside Green project in Victoria is the prototype of our deliverable: a decentralized system of mixed-use plants that both harvest energy from waste and create edifying spaces for the community to enjoy.

As knowledge professionals whose field is the built environment, we feel strongly that architects and planners must take responsibility for changing the urban energy paradigm. Infrastructure renewal is one of the most potent tools to accomplish this task, and in so doing, future-proofing the CRD against climate change and resource shortages actively being felt around the globe. Architect and planning-led infrastructure delivery is a logical procedure for a large-scale project that marries diverse technologies, housed in a range of structures, to urban design. Architects and planners leading a holistic, integrated design team is the best approach to balancing the many competing concerns inherent in a project in which every citizen is a stakeholder. It is the best structure to coordinate the contributions of the many diverse collaborators necessary to make it a success.

The triple benefits can only be realized if technology and engineering are united with ecological, economic, and social expertise. Innovative technologies can convert sewage into value-added downstream products like reclaimed water, electricity and heat, but only if they are properly operated and managed. Innovative technologies cannot be purchased if the appropriate financing and investment is not in place. And, innovative technologies can only add value and excitement to the communities they serve through compelling urban design. All of this must be put into the ecological, climatological and regulatory context of the region.

In light of these requirements, we have assembled a world class core team with the expertise and track record equal to this challenging and exciting task.

Busby Perkins+Will

Terence Williams has practiced in Victoria since 1971. In 2005, Terence Williams Architect Inc. (formerly the Wade Williams Partnership and Birley Wade Stockdill Armour & Blewett) merged with Busby Perkins+Will. We currently employ over 90 staff members in Victoria and Vancouver who share our mandate of a progressive, efficient, and professional practice. Combined with the bench strength of Busby Perkins+Will our firm's original mandate of design excellence and sustainability continues to resonate and flourish while raising the bar of excellence in architecture and planning to an even higher level.

With the bench strength of over 1200 staff in 21 offices seamlessly networked world wide, our firm possesses the capacity to meet all project schedule and budget requirements. Staff in our local offices possess a diverse range of skills and talents — from industrial design to large-scale master-planning — enabling us to take on a large variety of project types. Our design excellence is founded upon expertise in sustainable design, conceptual and strategic thinking and public consultation. Diverse skill sets in CAD, 3-D computer renderings, artist hand-renderings and graphic design offer us many avenues to explore and effectively communicate our project designs to clients and the public. Our unparalleled commitment to project management and efficient delivery, is acknowledged throughout the design and construction industries.



Our practice is deeply rooted in environmental sustainability. As architects and planners, we strive to improve the built environment and must acknowledge the impact our profession can have on the natural environment. Through our dedication to the research, development and practice of sustainability, we have sought to raise expectations within our industry and beyond. At Busby Perkins+Will, we practice within a policy of total social environmental and economic responsibility. We consistently employ a variety of design techniques to reclaim and recycle materials, conserve energy, reduce consumption, and minimize negative global impacts. As a practice, we implement green and sustainable philosophy in all that we do, working exclusively with consultants who share our philosophy and approach. This commitment is not a separate or additional service; it is an integral part of our practice.

Our commitment goes beyond buildings and planning - we also research, educate, and are heavily involved in the development of public policy and sustainable guidelines for Canada and the United States. We offer value-added service through an in-house research department that is dedicated to the advancement of green building practices and services. Our research department is responsible for researching green building products, exploring funding sources for green building initiatives, and ensuring each project integrates principles of sustainability from environmental, social and economic perspectives.

We believe there is a tremendous opportunity for the CRD to leverage funds from local, provincial, federal and private granting organizations to support your vision for this project. In the past we have secured support for sustainable initiatives such as renewable energy technologies, day lighting studies, and storm water management infrastructure. Our team can provide assistance and guidance in preparing and pursuing funding applications.

Examples of successful fund-raising prepared by our team include the following:

- Mount Pleasant Multi Use Community Centre – \$50,000 for Life Cycle Cost Study (50% Federation of Canadian Municipalities, 15% City of Vancouver, 10% Greater Vancouver Regional District)
- Dockside Green Sustainable development – \$350,000 from the Federation of Canadian Municipalities and \$85,000 from the Ministry of Environment (\$35,000 for Green Technologies and \$50,000 for developing the business case for the biomass system)
- White Rock Operations Building – \$25,000 from the Federation of Canadian Municipalities
- Centre for Interactive Research on Sustainability – recipient of Sustainable Development Technologies Canada Grant

BP+W's role will be to provide overall project coordination and delivery, urban design, planning, programming, public consultation, and to lead the entire team through the integrated design process. We will work closely with the CRD, the design team and all project stakeholders to ensure that the highest quality options are implemented and followed through to success on this project.

Corix

Corix Inc. is a leading provider of sustainable infrastructure services to municipalities, First Nations, developers and businesses. It specializes in the turnkey delivery of sustainable infrastructure systems. With its vertically integrated group of companies, it provides a wide range of infrastructure services ranging from water treatment plants, operations and customer care to project development and finance. Notably, it has a number of “first” initiatives to its credit including the first geo-thermal community in Canada and the first multi-utility providing water, wastewater, electrical, gas, and



alternate energy to a community under one umbrella utility company. It is through this multi-utility experience that Corix has developed the skills to work with communities to create truly integrated systems which optimize sustainability objectives. Importantly for the tax payer, the multi-utility can take advantage of integration cost savings and economic development initiatives to achieve truly cost-effective solutions.

Corix specializes in delivering services through partnerships which enables both the client communities and Corix to achieve greater results through efficient, open and transparent integration of 'know-how', resources and capital. Partnerships have been core to the successful and efficient delivery of water and wastewater treatment plants, geothermal and district energy systems. It is through the partnership process that truly sustainable solution can be created for the Victoria wastewater treatment initiative.

Corix will develop the business model that will successfully transmit the triple benefits to the communities of the CRD.

Urban Water

Urban Water is a Swedish engineering consultancy universally admired for the strength of their infrastructure work and their commitment to sustainability. Sweden is widely considered to have the most advanced infrastructures in the world and Urban Water is a big part of the reason why, having consulted on many of the most advanced recent projects. They are a research-based practice with a mandate to make the benefits of their carefully-developed "decision support" tools available to the wider world. In 2006, the government of Sweden took the extraordinary step of pledging to eliminate fossil fuels by 2020. The strategy hinges on meeting energy demand with biomass, key sources of which include sewage and urban organic waste. Urban Water and their associated network of infrastructure specialists are essential contributors to this national effort. Based on their unrivalled project experience in innovative and sustainable infrastructure delivery, they are exactly the right engineering consultants for this job.

Urban Water's role on the team is to bring the benefits of Sweden's innovative and advanced infrastructure model to North America. Using their "toolbox" of highly developed decision-making aids, Urban Water will provide analysis of environmental impacts, process flow, microbial risk, chemical risk, economic factors, and organizational development. They will provide unrivalled practical experience in implementing integrated infrastructure systems that find synergies between the many flows and exchanges of the urban ecosystem.

Aqua-Tex Scientific

Aqua-Tex is a specialized company engaged in leading-edge integrated ecological site planning for water management. They believe that decision-making based on sound principles of aquatic ecology are in the best interest of all projects, whether the goal is pollution prevention, fisheries enhancement, drinking water protection or habitat restoration. All of their work is founded upon maintaining the proper function of aquatic systems to ensure that they can continue to provide ecological and social value as part of a stable economy (triple-bottom line).

Their goal is to design and build projects that are efficient, effective and affordable both for the owner and for the community. Their solid understanding of the science of freshwater ecology ensures that their projects go beyond looking green, and function properly in both the short and long-term. Aqua-Tex Scientific believe in an integrated sustainable design team approach. They work closely with other professionals to ensure that designs are integrated with other aspects of the project and we continually seek new ideas and approaches from across North America. Their research program and support of graduate students ensures that the firm remains on the leading edge of new design practices and innovative strategies for water management, low impact development, resource recovery and advances in freshwater ecological science.



Aqua-Tex's role on the integrated planning and design team will be to understand the ecology of the urban and sub-urban environment and to assess the need for, and performance criteria of, engineered technologies to protect and maintain landscape health. They provide the team with direct links to cutting-edge integrated water management research teams in the US, Japan, Europe and Australia and to the newest innovative wastewater technologies available in Canada. They will use their understanding of "Designing and Planning With Nature" to regenerate the natural environment as a critical part of the infrastructure of our modern cities.

John Rowse, B.A.A, C.I.P.H.I. (C), M.A.

John Rowse is currently the Executive Director for the British Columbia Onsite Sewage Association (BCOSSA). The Association trains and governs members involved in the design, installation and maintenance of onsite wastewater systems. He obtained this position as a result of developing the Sewerage System regulation and its companion document, the Sewerage System Standard Practice Manual. In this position he is responsible for developing educational materials, policies and procedures for member activities, lobbying on behalf of BCOSSA membership with local and provincial government, and developing research and product verification programs to support technological and technique changes in the industry. John is also the organization's primary technical consultant responsible for assisting members with issues related to regulatory and standards interpretation.

Prior to his position with BCOSSA, John was the Project Manager, Land Use in the Population Health and Wellness division of the British Columbia Ministry of Health. John managed the provincial land use program, developed and implemented policy for onsite wastewater management, solid waste, bio-solids, biomedical waste and other land use issues. He has expertise in sustainable wastewater management, sustainable development and non-potable water treatment and use.

John will provide technical expertise related to decentralised wastewater systems, storm water management and non-potable water use, legislation and policy interpretation related to wastewater, use of non-potable water and land subdivision, planning expertise for wastewater management programs, lobby expertise at all levels of government and project development and management expertise.

Chris Corps, BSc MRICS, Asset Strategics Ltd.

Chris is a Principal of Asset Strategics, providing real estate and business advisory services, with associated consulting and implementation support. He has over 25 years of experience including a wide range of investments and developments, acquisition, leasing and disposition, policy and strategy for both public and private sectors. Having worked both for and in government, and for and in the private sector, he understands and is familiar with both, their needs and differences, challenges and opportunities.

Chris has been involved in projects ranging from small and large buildings, offices, shipyards, residential and commercial properties to advising on over 17m sq ft of developments in 3 years. His diverse expertise ranges from Public-Private Partnerships (P3s) and included creation of the first whole-program P3 process, with over \$7bn in projected savings and being awarded best practices in Canada for procurement. He wrote the mechanism for BC's first fully audited off-book P3 and led business case development methods now used in 16 countries. Chris' core focus is on value enhancement, including for projects such as Victoria's Dockside Green, London's Canary Wharf and Vancouver's Coal Harbour.

Chris was the first Chairman of the Royal Institution of Chartered Surveyors Canada, the Canadian arm of the worlds' largest real estate professional organization. He has a long standing involvement in the Royal Institution's International



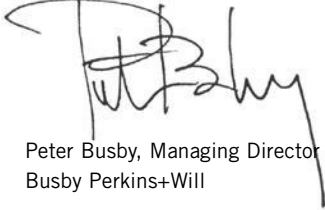
Strategy and is involved in international valuation standards revision. He is Environmental Faculty representative for RICS Americas and an Advisory Board member of a key US initiative on Green Finance. He is a consultant to the Commission for Environmental Cooperation and initiated and led Green Value, an international study on the value of sustainable practices. He is the Founder and initiator of the Vancouver Valuation Accord, a global standards and practice initiative encompassing all sectors, involving over 100 countries, focussed on sustainability and its business case.

Chris Corps' role will be to rigorously assess the costs, risks and benefits of the proposed systems according to best practice standards. His background in costing, real estate and project finance will provide the team with unparalleled experience in management and financial delivery structures for this project.

We anticipate that additional team members will be added dependant upon the path the CRD wishes to follow, and look forward to working with you to outline the best possible team for this project.

It is our pleasure to offer our services for this benchmark project and we thank you for considering our team and our approach for this unique opportunity.

Sincerely,



Peter Busby, Managing Director
Busby Perkins+Will



Terrence Williams, Principal-in-Charge (Victoria)
Busby Perkins+Will

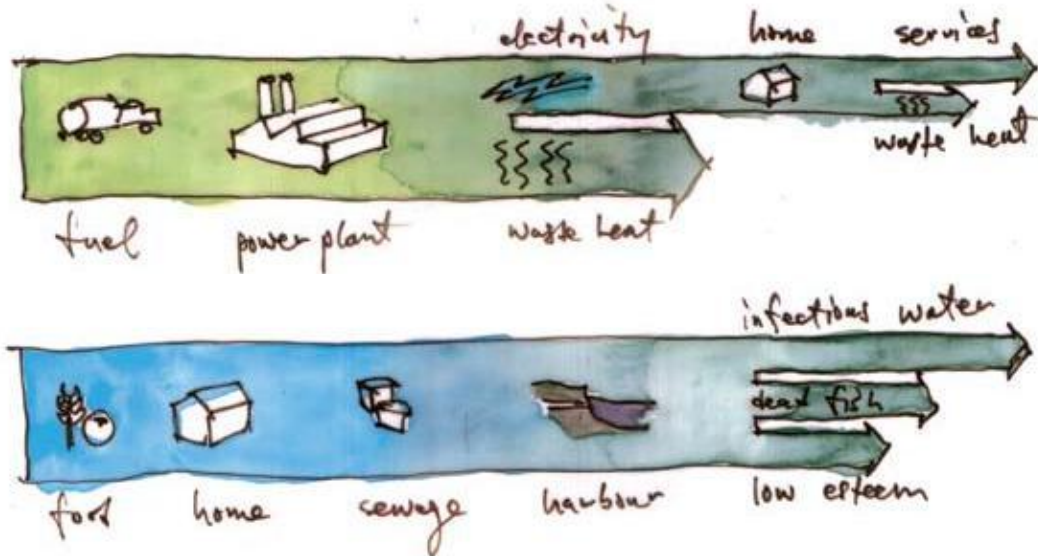


2.0 APPROACH

Conventional infrastructure was developed to meet the needs of a different era – an age of limitless cheap energy, loosely regulated pollution, and boundless enthusiasm for industrial development. It is no surprise, then, that the systems typically employed in conventional infrastructure utilize enormous amounts of energy, generate copious pollution, and are housed in enormous stand-alone factories that do not integrate well with the surrounding urban fabric.

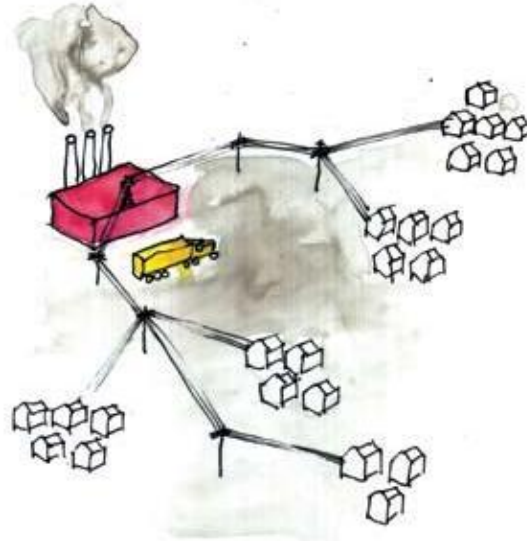
To summarize, conventional Infrastructure has two broad failings:

1.0 Poor energy profile - conventional processes are energy intensive and generate pollution





2.0 NIMBY-ism (Not In My Back Yard) - nobody wants to live near a massive polluting sewage plant



These failings can be attributed to two main factors; a fragmented design process and excessive scale.

Cities are complex organisms with a myriad of daily inputs, flows, exchanges, transformations, build-ups, and releases. Infrastructure is the tool used to manage these complicated interactions. The best infrastructure will link the constant flows and exchanges within the urban environment, finding synergies between the wastes of one process and the feedstocks of another. The most sophisticated systems eliminate waste altogether, transforming every waste product into a useful value-added output. This “industrial ecology” model has been enthusiastically received in Europe, particularly Sweden, and results in a dramatically improved urban energy pattern, not to mention an enhanced local economy. In North America, the conventional design process fragments the complexity of services into separate, unrelated entities. Separate solutions are devised for electricity, heat, drinking water, and liquid and solid waste management, without regard to the clear synergies between their inputs, processes and outputs.

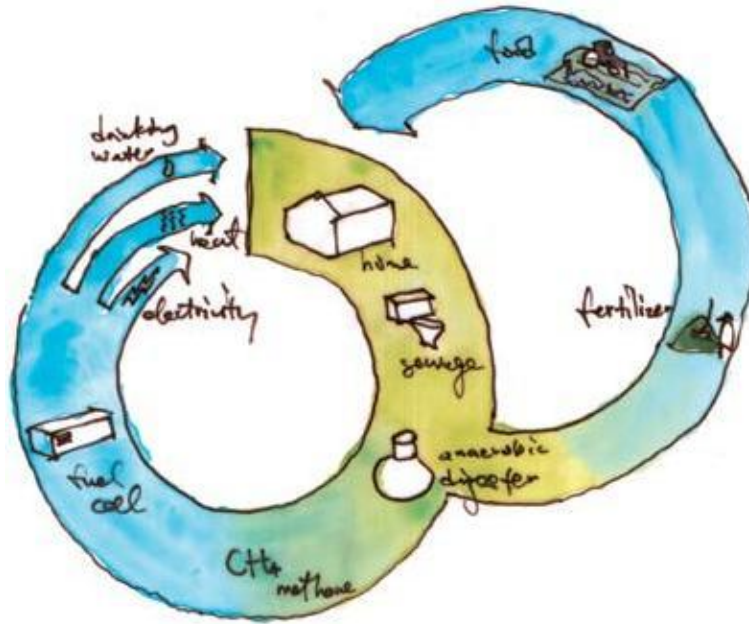
Excessive scale has serious negative consequences for both the energy profile and the quality of urban space. The central dogma of conventional infrastructure is “economies of scale”. The bigger the plant, the more economical it is thought to be. This ignores several practical truths. Conveying sewage against gravity requires a large amount of energy. The wider the service area of the plant the more energy is lost in conveyance, and this loss is continuous and intractable. If clean energy is one of the downstream value-added outputs we require the plant to provide, then optimizing the energy performance of the system is of paramount importance. This would require scaling plants to the boundaries of existing watersheds, as water always finds the path of least resistance and lowest energy. Due to their enormous scale, centralized plants are virtually impossible to integrate into the urban fabric, producing large industrial swathes devoid of cultural vitality. Centralized plants do not improve the value of the land on which they sit and generally lower the value of adjacent properties. Who wants to live next to a massive factory?

None of these outcomes are desirable or necessary. A less industrial, smaller scale approach can simultaneously improve the energy profile, the quality and vitality of the urban environment, and the economics of infrastructure delivery. Our approach begins by reversing the two broad failings of conventional infrastructure:

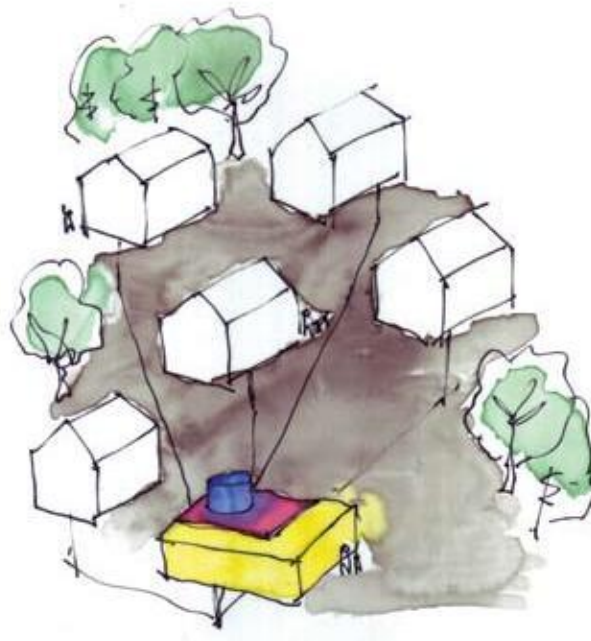


1.0 Optimized energy path:

- utilization of only non-polluting technologies that harvest energy
- all "waste" products treated as feedstocks for other processes



2.0 Creation of vibrant mixed-use complexes that add vitality and value to the community





These desirable outcomes can be achieved by employing an integrated design process and by working at a localized scale that keeps the inputs, solutions and benefits within the community.

Nothing is more critical to reconfiguring the urban energy pattern and enhancing the livability of our built environments than an integrated design process. This means that all of the flows of water, energy and waste are considered in their entirety. It also means that professionals from all of the fields that will implement the system are involved in the conceptual development from the project outset. Our team brings together top world and local experts in the fields of ecology, engineering, planning, architecture, operations, risk management, and financing. Each will contribute to the overall strategy development in a series of collaborative design charrettes, and then develop a detailed implementation plan for their area of responsibility. In this way, decisions at all steps of the process will be made with the full input of all the contributors required to ensure a resoundingly positive addition to the communities of the Capital Regional District. Infrastructure is not just a system of services, it also needs to be a foundational element of the look and feel of our communities. Do we want to be a city of factories, or a city of parks?

This fundamental decision about urban character cannot be answered without considering scale. Decentralized plants will eliminate the parasitic energy losses that centralized plants suffer by not working against nature. But their smaller scale allows a whole other range of possibilities that massive plants can never offer. Small scale plants can combine infrastructure services with other building programs in mixed-use complexes. These other programs can be whatever each community aspires to, whatever will provide it with the most benefits. In one part of town, it could be a mixed-use residential development, in another part a garden centre, or a community gymnasium, or a laboratory, or a bus depot. Each community in the CRD will have the opportunity to add programming to their infrastructure complexes according to their own unique concerns, needs and aspirations. In this way property values can be raised not lowered, benefiting both local owners and the municipal tax base.



3.0 Deliverables

The letter from BC Provincial Environment Minister Barry Penner asks for a “fixed schedule” for sewage treatment by June 30, 2007. Our team will work closely with the CRD and other project stakeholders to develop an implementation plan for this project by the required deadline.

Our team offers a broad range of expertise in order to develop the required urban infrastructure plan, design the systems using energy-harvesting zero pollution technologies, plan complementary programs, analyze the associated costs and risks, and develop implementation and management plans should some or all of these services be required.

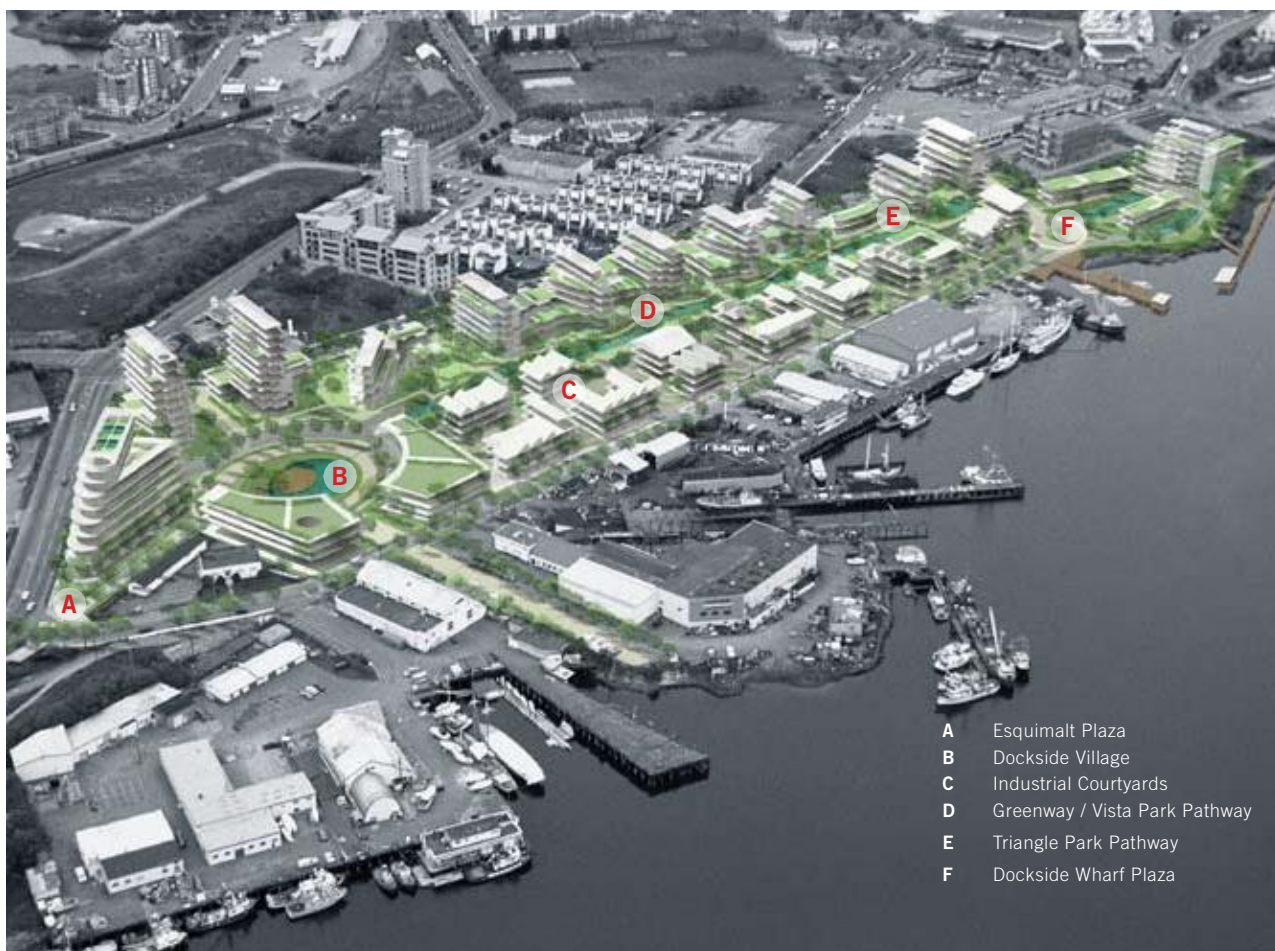
We can provide a broad range of deliverables including, but not limited to the following, should these or other items be deemed appropriate once a final scope of services is determined:

- 1.0 Using an integrated design process bringing together top international and local experts in all the relevant fields, we can produce a comprehensive strategy for the delivery of sewage treatment to the communities of the CRD. Given the synergies of aligning the various other waste streams and utility services of the urban system, the strategy must deal with more than just sewage, and will dramatically improve the energy profile, the quality and livability of the urban environment, and the local economy.
- 2.0 We are able to identify sites for the plants through rigorous analysis of the following factors:
 - existing topography and natural watersheds
 - existing sewerage infrastructure
 - the operational ranges of the technologies employed
 - brownfield or degraded sites in need of remediation
 - the concerns and aspirations of citizens and authorities
- 3.0 Once the plants have been sited, we would develop a system for each that optimizes its energy profile and its value-added outputs according to the opportunities and constraints of its site. There are no one size fits all solutions and there are complicated factors to balance for each situation. For instance, a contaminated site with a very small footprint might be more beneficial to remediate and develop, even if it means the system employed



will harvest less energy for the community than a more spacious site would permit. Options for types of energy-harvesting, zero-pollution technologies our team has experience implementing are listed in Section 5.0.

- 4.0 We have the ability to plan complementary programming according to the concerns hopes and needs of each community, in close consultation with community leaders and stakeholder groups, municipal authorities and property developers.
- 5.0 We would rigorously test the costs, risks and benefits of the strategy to ensure that the citizens of the CRD receive good value for money and are not exposed to undue risk.
- 6.0 We have the ability to work with project stakeholders to craft an appropriate schedule and budget that optimizes the full range of financing options in the Public-Private Partnership model should this approach be desirable by all involved.
- 7.0 We are able to develop an operations and management plan equal to the task of transferring the triple benefits of the system back to the community.



- A Esquimalt Plaza
- B Dockside Village
- C Industrial Courtyards
- D Greenway / Vista Park Pathway
- E Triangle Park Pathway
- F Dockside Wharf Plaza

4.0 Dockside Green: The Prototype

As a prototype for the mixed-use, decentralized plants that form the basis of our proposal, we would like to present Dockside Green in the City of Victoria in detail. This project represents a successful collaboration by members of our proposed team.

Origins

The Dockside Green project, located in Victoria, BC, is the largest development in Victoria's history. Busby Perkins+Will Architects was hired by co-developers Windmill Developments and VanCity Enterprises (VCE) to reclaim and redevelop approximately 12 acres of former industrial waterfront property. The new scheme will include commercial, residential, live/work, work/live, and light industrial uses. With the rehabilitation of a brownfield site and LEED Platinum ratings targeted for every building, the project will be the 'greenest' project of its kind in North America, and a global showcase for large-scale sustainable development.

In its mix of uses, pedestrian friendly streets, open space, and innovative design, Dockside will exemplify the principles of new urbanism. The site will primarily be oriented around a greenway running parallel to the harbour, with a village



plaza providing a focal point at the western edge of the development. Residential towers to the north of the plaza will reach up to 10 storeys, while the majority of development will be between three and seven storeys tall. Development along the waterfront will include townhouse, retail, and industrial units, with taller residential towers across the greenway to the north.

Dockside's sustainable strategies stand out because of their site-wide application. Though many traditional techniques will be employed, Dockside's comprehensive green mandate is unparalleled in its scope, with innovations including bio-mass energy generation, a green car sharing program, and onsite bio-diesel manufacturing.

The level of involvement of the City of Victoria and other stakeholder groups has been similarly exceptional; unprecedented levels of input from the community have helped to ensure that Dockside maximizes its benefits for everyone involved.

The Dockside project follows a Triple Bottom Line philosophy, which examines the social, economic, and environmental consequences of development. Rather than treating these three components as separate or individual targets, the team's approach integrates and intertwines them, taking advantage of synergies that a more segmented approach would undoubtedly fail to recognize. Instead of treating economics as the determinant, the team uses Whole Systems Costing to demonstrate how a commitment to the environment and a livable new urbanism can contribute to improved marketability, job creation, and economics.



Dockside as a Global Showcase

The Dockside development will be an international showcase of sustainable community building. Because of its ambitious green agenda, its holistic approach to design and development, and its high potential for replicability across the world, the project has already received a great deal of international attention. Its unprecedented combination of cutting-edge sustainability, high-quality urban design, and a true community commitment will set an international example for years to come, creating further social and economic benefits for residents of Greater Victoria and the province of British Columbia.

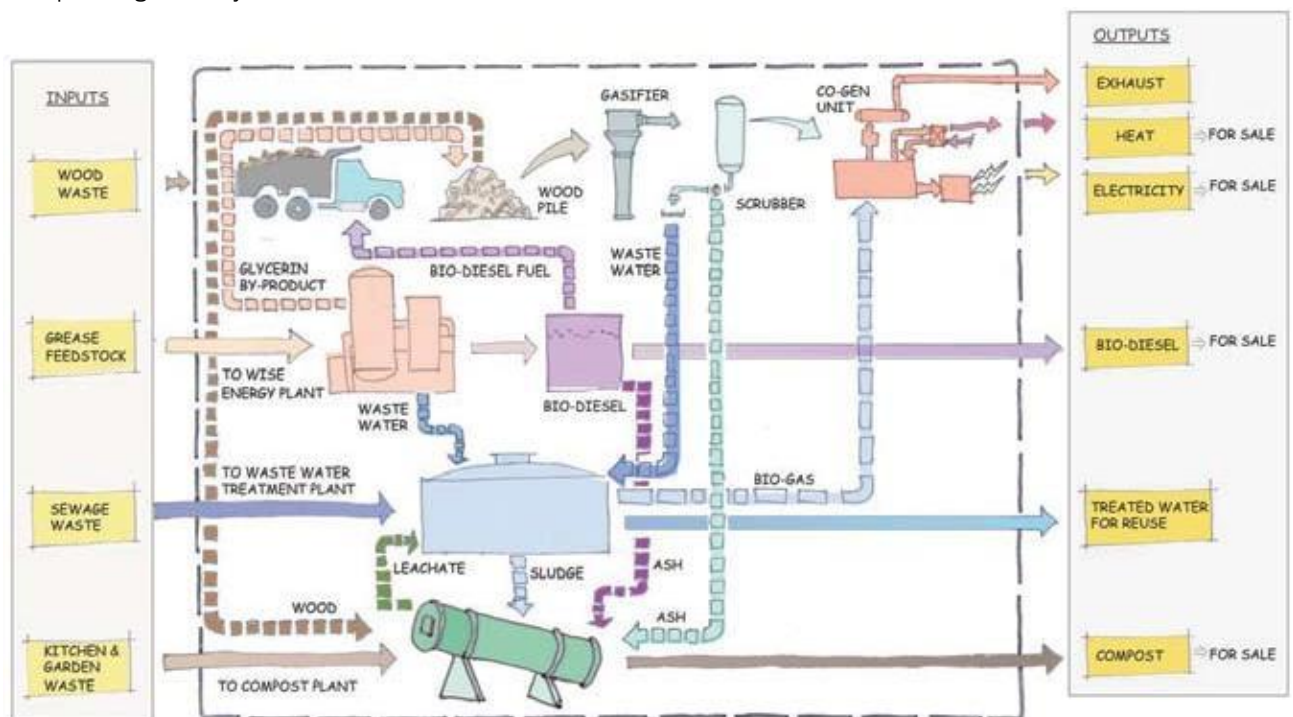


Dockside Innovations

Dockside’s environmental targets are unprecedented in North American development. Some of its most innovative solutions include:

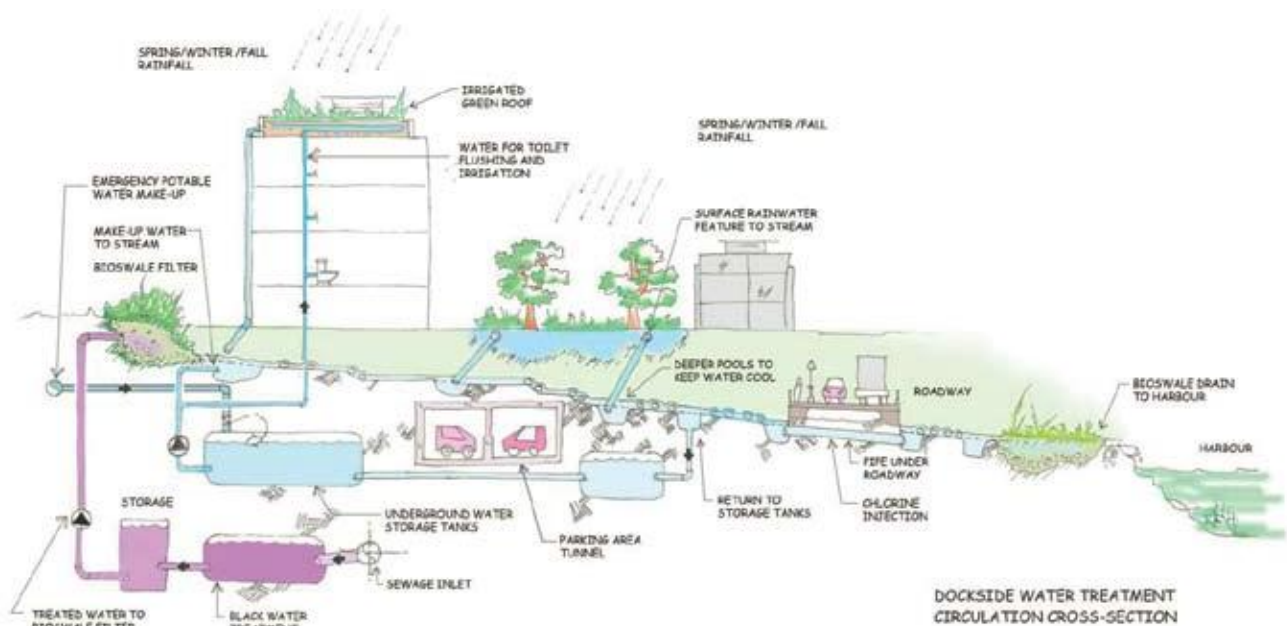
Sewage Treatment

Dockside will use bioreactor tanks and ultra-filter membranes to treat all sewage on-site, making it virtually drinking water quality and reducing potable water consumption significantly. The on-site wastewater treatment plant will provide tertiary treatment for all buildings on the Dockside lands. The treated water will be re-circulated back into buildings for irrigation and toilet flushing, as well as into the central water feature for further cleaning prior to being discharged into the Inner Harbour at Point Ellis Park. In addition, heat will be extracted and supplied to adjacent buildings via heat pumps. The plant will be located below the central greenway/waterway with only one exposed wall facing the Harbour Road light industrial neighbourhood with service access via a shared driveway off Harbour Road reducing water consumption significantly.



Biomass Energy Co-Generation

The Dockside project’s heat and electricity will be generated at a Biomass Energy Co-Generation facility, which will use wood waste from mills, wood working shops, tree trimming, and deadfall as fuel. Rather than burning wood waste, the facility will use a thermochemical gasification process that will produce a synthetic gas, with a minimum of solid waste and without smoke. The small amount of ash that is produced will be used as aggregate for cement or fertilizer. Ralmax, who collects and recycles wood waste, will supply sufficient wood stock for the facility, and is also interested in using the fuel in their trucks.



Victoria Sustainability Centre

The Victoria Sustainability Centre will anchor the Dockside development, creating a hub of environmentally-minded activity and innovation. The Centre will house local non-profit and community-based agencies engaged in ecological and social justice work, as well as providing commercial space for local values-based businesses. It is envisioned as an innovative and exemplary green building – a living, learning laboratory.

The Centre's Steering Committee is currently developing a cooperative ownership strategy for the building, to ensure that it remains affordable, effective, and true to its ethics for the long term. Windmill and VCE have committed to donate land as an amenity to the Centre.

Wise Energy Co-op

The project will also include facilities for the Wise Energy Co-op, which will be used to produce approximately 4 million litres of bio-diesel per year. Various uses of bio-diesel will be demonstrated within the development to assist Wise Energy in marketing the fuel. This is just one of many initiatives of this type to create economic opportunity and jobs for our community.

Car Sharing Program

The Dockside project will feature a car-sharing program, with 3 Neighbourhood Electric Vehicles (100% electrically powered cars with speeds between 35-40 mph) and 8 Smart Cars. The Smart Cars will run on bio-diesel, supporting Wise Energy and ensuring that all co-op vehicles are non-fossil fuel operated. VanCity has committed to a zero interest loan program for alternative fuel vehicles, and the team is currently examining the use of electrical bicycles in the program as well.

Design Philosophy

We are pursuing a holistic approach to design, combining building systems, landscapes, transportation, economics, and activities and amenities, and building relationships with surrounding communities and usergroups. Our integrated design process has involved stakeholders of all levels from the project's outset, ensuring that the Dockside project will benefit all involved for many years to come.



The development will feature a mix of commercial, office, retail, residential, amenity, and industrial uses, to encourage activity and employment, and its assortment of land uses and ample open space will enhance the character of the site and add vitality to the surrounding community. The project will also encourage innovation in design, and will be a world-class example of cutting-edge sustainable urban development within a healthy community setting.

The Triple Bottom Line

A development cannot be truly successful if it fails to recognize the importance of a vibrant and inclusive community, a strong economic platform, and an unerring commitment to sustainability – the three components of a Triple Bottom Line approach. We believe that these goals should not be approached individually, or on a piecemeal basis; our design strategy integrates and intertwines them, using a holistic approach that enhances the positive effects of each.

Economically, the project will create new jobs and new opportunities. It will support local business, and demonstrate sustainable products and technologies developed by local companies and organizations, creating market exposure at an international level. The project will also create new businesses, including a bio-diesel facility and a biomass energy generation system.

Socially, Dockside will be an inclusive, mixed-use community, providing for a wide range of ages and income brackets – 11% of the housing stock created will be affordable housing. Emphasis on amenities, greenspace, and alternative transportation will foster the development of a healthy, vibrant community, and a dynamic mixture of building types and massing will respect neighbouring uses and views.

Environmentally, the project will be Greenhouse Gas Neutral, using innovative energy strategies like a waste wood-fuelled generation plant. All sewage will be treated on site, and potable water use will be reduced by up to three-quarters in buildings and be eliminated completely for landscaping. Green roofing, stormwater retention, alternative transportation systems, and many other strategies and techniques will be used to achieve LEED Platinum certification for every building on the site, and will play a key role in the project's sustainable education program for residents and visitors.



Enhancing and protecting the long-term viability of industrial uses adjacent to the site, while creating new uses at Dockside, is a key focus. In fact, the diversity of uses is one of the qualities that makes Dockside Green so exciting; no preceding eco-residential and eco-industrial developments have incorporated such a wide array of complementary uses within one project.

Partnering with the Community

Fostering a positive and productive relationship with community members, organizations, and businesses is vital to the success of the Dockside project. From the project's outset, we have made every effort to involve stakeholders and citizens in the development process, creating a Community Advisory Group to guide the team through the development process. The group will ensure that issues and opportunities are addressed as the project progresses, and guarantee that the Dockside project provides socio-economic and ecological benefits for local user groups and for the Greater Victoria area as a whole.

The project is slated to include a 5,000 square foot bio-diesel factory which will be leased to the Wise Energy Co-op. Dockside will also house the Victoria Sustainability Centre, developed by Windmill and VCE in conjunction with local non-profit agencies and socially responsible businesses, which will house local non-profit and community-based agencies doing ecological and social justice work. The Centre will also provide office, retail, and commercial space for local values-based businesses, and serve as the community meeting space for the Vic West Community Group.



During construction, the team will participate in construction job training programs such as the HardHats Program, and will work with the Canadian Homebuilders Association in Victoria to create job training and employment opportunities for those who need them most. The team is also working with the University of Victoria, Camosun College, and Royal Roads University to provide student cooperative opportunities for companies located on the site, throughout the phasing of the project. The project's highly cooperative, community-oriented approach sets it apart from other developments of this scale.

Project Information

Client:	Windmill Development Group / VanCity Enterprises
Architect:	Busby Perkins+Will Architects
Structural:	Read Jones Christofferson
Mech/Electric:	Keen Engineering
Civil:	Komex International
Ecology/Stormwater:	Aqua-Tex Scientific Consulting
Green Building:	BuildGreen Consulting
Landscape:	PWL Partnership
Location:	Victoria, BC
Construction:	2006 -2016
Budget:	\$300 million

Area

Site Area:	14.9 acres	Residential:	87, 982 sm
Building Size:	120, 320 sm (total)	Retail:	5, 119 sm
Height:	10 storey maximum	Environmental:	5, 880 sm
Parking:	1, 417 stalls	Office:	7, 206 sm
Hotel:	13, 470 sm	Seniors:	4, 900 sm





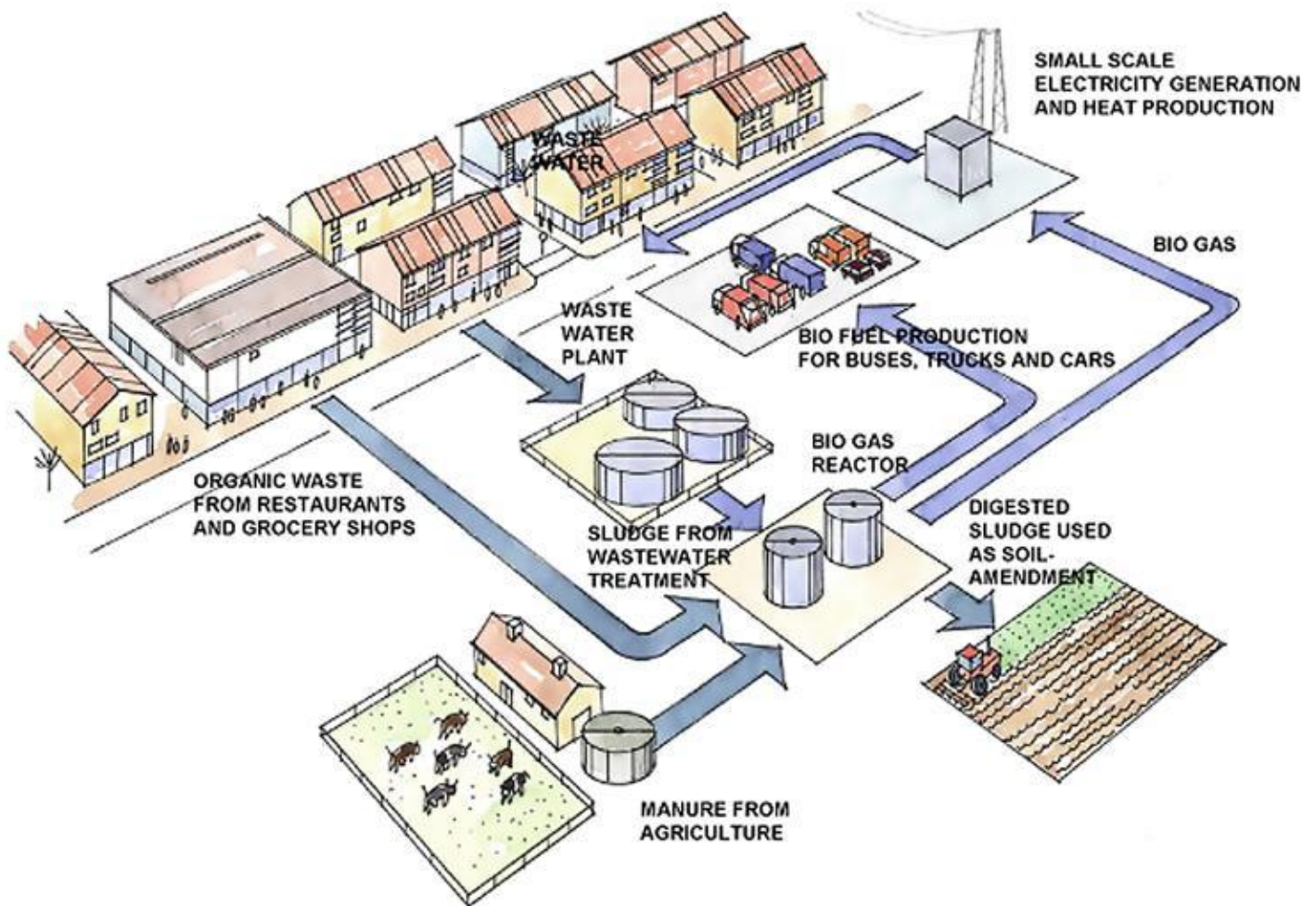


5.0 Systems & Technologies

Due to the wide variety of opportunities and constraints and the heterogeneity of the CRD, we are fully committed to determining the most appropriate technology for each area/region within the CRD. Regardless of the technologies chosen, they must:

- harvest energy
- work with nature, not against it
- treat waste as a feedstock for the next process
- eliminate pollution and green house gas emissions to the greatest practical extent
- be proven and effective at the scales they will be employed
- be cost effective

The graphic below illustrates a type of resource recovery scenario that has been employed successfully in Sweden. Based on a preliminary analysis of the infrastructure needs of the CRD, we propose the system outlined in the following graphic as a baseline to be augmented over the design process.





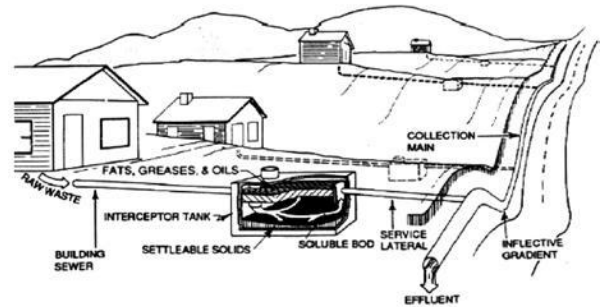
Selected Process Technologies

We will examine a broad variety of technologies so that we may provide the highest and best use for the sewage resources of the CRD. Our team has researched the following technologies, all of which have been comprehensively road-tested:

- *Fixed Growth Aerobic Biofilter WWTP* – The biofilter is a very cost effective solution for secondary treatment. It is inherently the simplest aerobic treatment process with very few moving parts or control requirements. The Biofilter achieves a number of distinct advantages including compact footprint, low energy consumption, low sludge production and, importantly, minimal operator attention or maintenance.
- *Membrane Wastewater Treatment System* – The new flat panel membrane treatment process is a good selection for achieving re-use water quality standards in an urban environment. As membranes with a pore size of less than 0.5 microns provide the final clarification, the treatment plant acts as a physical barrier between the treatment process and the final effluent. The pore size is small enough that it blocks many bacteria types. Membranes also provide a very clear low turbidity effluent which enables UV disinfection to work well.
- *Wetland Wastewater Treatment Systems* – Perhaps the most natural wastewater treatment systems available are wetlands which provide good treatment with minimal use of mechanical systems. Through a combination of digestion by microbes and nutrient uptake by plant life, the wastewater is treated. Wetlands can also be combined with mechanical treatment systems to achieve tertiary treatment quality. There are also wetlands systems that are housed in buildings which create unique opportunities for urban environments, and can enhance the CRD's reputation of a "Garden City".
- *Vertical Wastewater Treatment Systems* – A unique method to achieve large scale treatment in a compact footprint incorporates a deep vertical shaft drilled into the ground and lined to provide the treatment tankage. This design, proven in many applications around the world, achieves secondary treatment, or with final filtration equipment, tertiary treatment. The process is also well known for its low power consumption.



- **Small Bore Sewer System** – A unique gravity based sewer system utilizes HDPE pipe and settling tanks at each building to create a very cost effective and environmentally friendly system. Using fused HDPE pipe, the system is approved for zero inflow and infiltration, greatly reducing the cost of building and operating treatment plants. By removing solids, the pipe diameter is much smaller and pipe gradient less steep thereby achieving significant construction savings.



- **Biosolids Value- Aerobic Digestion** – The (EATAD) Enhanced Auto-Thermal Aerobic Digester process has the potential to provide high value added revenues from the conversion of biosolids to very effective bio-active organic fertilizer. Growth trials conducted for a number of large fertilizer companies have shown significant crop performance benefits from the EATAD fertilizer. Such a system could help reduce the costs for implementing and operating sewage treatment systems as well as enhance the productivity from farm lands.
- **Biosolids Value - Anaerobic Digestion** – Anaerobic Digesters are a proven method for capturing value from the residual biosolids. In an enclosed tank, biosolids are anaerobically digested to create methane which has multiple value added uses. In different applications around the world, methane is used as a fuel for district heating, for powering vehicles or for generating electricity using large engines. Newer processes enable the conversion of methane to different chemical products which can be sold to industrial clients. Even the residual biomass after digestion is a useful soil enhancer.
- **Pretreatment Filter** – The pretreatment filter is a very efficient means of reducing wastewater strength and removing solids prior to the sewage entering the treatment plant. With lower strength sewage, the treatment plant can be designed smaller and importantly consumes significantly less energy in the biological aeration and mixing process. The filter is compact in design and efficiently creates a solid cake from the screenings for ease of handling.







6.0 A Triple Bottom Line - The Benefits

In order to maximize environmental benefits, the system must reconfigure the urban water and energy pattern and generate no pollution. It must take advantage of local climate and geology and contribute to the regeneration of the natural environment.

In order to maximize social benefits, the system must create vital, inhabitable spaces in the midst of our communities, not uninviting industrial wastelands.

In order to maximize economic benefits, the system must generate revenue and not lower the value of adjacent properties.

Our approach will achieve these goals through an integrated design process that harmonizes infrastructure needs with the design of the urban environment.

Economic Bottom Line

- transforms waste into downstream value-added products:
 - electricity
 - heat
 - process water
 - fertilizer
- contributes new real estate revenue
- contributes new tax revenue
- creates the opportunity for carbon credit revenue



- creates a cost synergy by bundling many services into one infrastructure node
- can be built incrementally instead of all at once
- minimizes the need for expensive new conveyance infrastructure, which maximizes the budget for technology
- capital costs and risk management can be handled by PPP partners if appropriate

Social Bottom Line

- adds new programming to communities instead of creating an industrial wasteland
- overcomes NIMBY-ism
- reduces the possibility of catastrophic shock
- combines very well with parkland and landscape
- creates the opportunity for brownfield remediation and urban renewal
- allows different municipalities to move forward at different rates, and with different priorities
- will produce new high-quality jobs

Environmental Bottom Line

- will provide tertiary-quality treatment
- will produce no pollution or carbon emissions
- will be an energy creditor not an energy debtor
- will convert wastes into value-added outputs
- will generate continuous power which will buffer the intermittency of other renewable power sources
- will address heating as major energy need through cogeneration
- will make use of methane and carbon dioxide, two green house gases that would be produced in any case



Appended Team Information

Busby Perkins+Will and our team are in an excellent position to take on this commission. With the bench strength of over 80 local staff, seamlessly networked with 21 offices and 1200 staff world wide (3 locations in our western region - Victoria, Vancouver and Seattle) and a core team of consultants, we have the skills, knowledge and capacity to take on the challenges of the project head on.

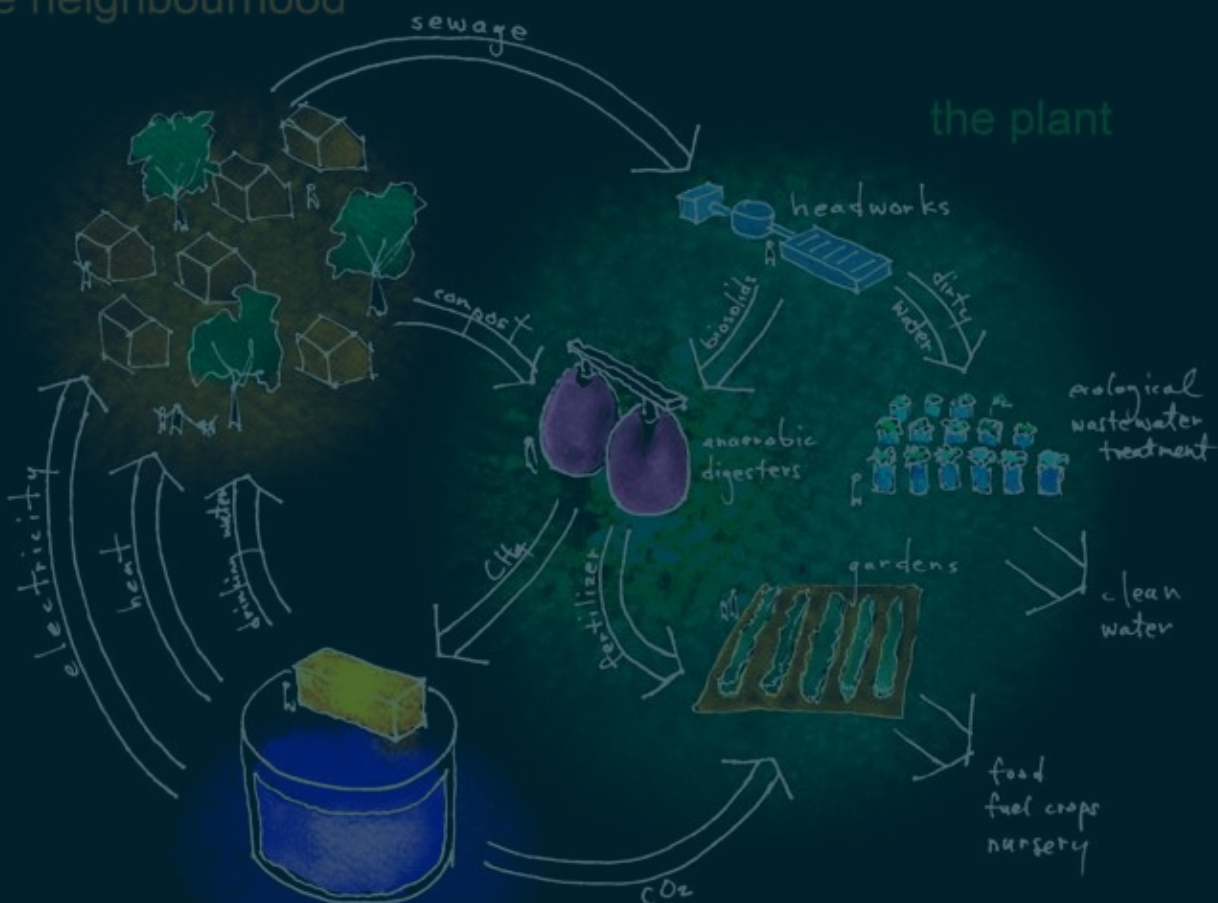
The following pages include detailed firm information including CVs for key team members and information on our consultant group's relevant project experience.

Our core team consists of the following members:

- Busby Perkins+Will
Prime Proponent / Lead Design, Planning and Coordination
- Corix
Systems Design and Business Model Testing
- Urban Water
Systems and Institutional Design and Implementation Models
- Aqua-Tex Scientific
Ecological Site Planning and Water Management Consultants
- John Rowse, BC Onsite Sewage Association
Wastewater Systems & Policies Consultant
- Chris Corps, Asset Strategics Ltd.
Cost, Risk Assessment, Real Estate, Financing and Business Advisory Consultant

the neighbourhood

the plant



fuel cell
cogeneration unit

BUSBY
PERKINS
+ WILL