



## CHAPTER 7

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# Introduction

This chapter provides an overview of the regional district services that will form a part of the RGS. Namely, it deals with ‘hard’ services – water, sewer and solid waste. These services are each governed by a separate and complex series of laws and regulations with no single coordinating agency or enforcement body. The extent and nature of regional oversight is also different for each service. In addition, each individual service is delivered through a separate infrastructure and delivery system with its own unique characteristics and issues.

In this chapter, water, sewer and solid waste services and their relationship to regional growth are discussed in three separate sections. Each section begins with a review of the system of infrastructure and programs that allow service delivery. This is followed by an overview of the government bodies and legislation that govern the provision of the service. Finally, each section discusses a number of issues surrounding the relationship between population growth and the individual service under discussion. A closing section at the end of the chapter reviews some points for discussion for the RGS to consider in servicing growth in the Region.

In planning for regional district services, there are two crucial points to keep in mind.

1. The ability to provide these services is directly tied to the ability of the valley to absorb growth. The region’s water operators can only provide so much water without taking necessary flow away from the fisheries or farmers or BC Hydro. Likewise there are limits on the valley’s capacity for the disposal of both garbage and sewage.
2. Infrastructure-intensive services such as these have high associated costs in terms of construction, operation and maintenance. Every additional metre of water main or sewer pipe entails higher initial costs of construction, and higher annual costs of service and repair.

The planning of regional district services is directly linked to land use planning. The more dispersed our settlement patterns, the more our infrastructure must be extended, the more expensive it is, and the greater impact it will have. Due to their potential impact and cost, extensions of these services must be carefully considered. Proper land use planning must, therefore, be the driver of infrastructure. The RGS provides a key opportunity to come together as a region and discuss our priorities and objectives for land use patterns, services, and infrastructure.

There are two other long-range planning efforts being undertaken in conjunction with the RGS, a regional sewer plan and a regional water supply strategy. The regional water supply strategy will provide a long-term plan for domestic water supply based on an assessment of available water supply sources, water quality and treatment, the capacities of the distribution system and the cost of service provision. The regional sewer plan will create a rational long-term plan for managing liquid waste based on an assessment of current levels of service and potential treatment options. The RGS is being developed along with the regional sewer plan and regional water supply strategy and will help to coordinate the planning of growth with the provision of services. This chapter is intended to provide the necessary background to begin a region-wide conversation on the relationship between population growth and regional district services.

## Regional Services and Growth Management

The key services of water, sanitary sewer, storm sewer and solid waste are affected by the type of land use adopted throughout the Comox Valley. Delivered well, these services provide sanitation, and control disease. These are services often taken for granted, with the associated infrastructure buried below ground. However, their importance is such that proof of sufficient supply is generally a condition of development approval. Infrastructure extensions must, therefore, be guided by an understanding of where and how growth should occur considering the capacity of, and infrastructure costs associate with, these services.

# Water

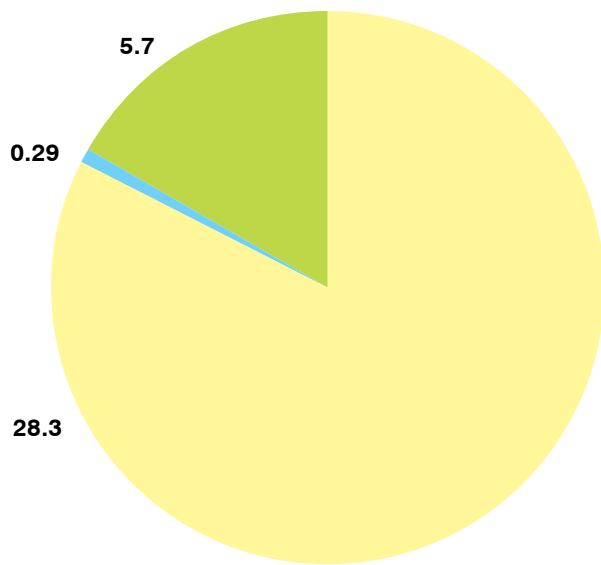
In the Comox Valley, water is arguably the greatest limiting factor to growth. High levels of population growth coupled with high consumption levels have placed a strain on water supply and delivery systems. As we move forward with the growth strategy, we must keep in mind that the nature and pattern of future growth will have a great impact on the Valley's water supply and delivery infrastructure. Development that proceeds without sufficient attention paid to impact on the Valley's water system will place a strain on the fiscal and environmental health of the Comox Valley. Conversely, development which seeks to minimize water consumption, while maximizing the efficiency of water delivery will help to ensure that future generations of Comox Valley residents can provide for their own water needs.

When considering water service provision, there are two separate but related issues: water quality and water quantity. This section focuses almost exclusively on water quantity. While urban and regional growth affects water quality, these problems can be mitigated through the enactment of various site planning measures and engineering standards. Water quality issues will be dealt with in detail by the Regional Water supply strategy.

## Water Systems in the Comox Valley

Comox Lake is the largest in the Comox Valley and the primary point of supply for the region. Just how much water can be extracted from this system is guided by the various licenses that have been granted as outlined in the 2004 BC Hydro Water Use Plan for the Comox River. The Plan fully divides the majority of available water in this system between the three licenses of the Department of Fisheries and Oceans, BC Hydro, and the CVRD (Figure 7.1). The Ministry of Environment and the Integrated Land Management Bureau issue licenses. Licensees are granted extractions (or diversions) of water generally measured in cubic metres per second.<sup>4</sup>

### Water Licenses on Comox Lake in m<sup>3</sup>/s



**Figure 7.1**

- BC Hydro
- Department of Fisheries and Oceans
- Comox Valley Regional District

Water is extracted from the following sources:

- Water is normally extracted from the BC Hydro Penstock, just upstream of the Puntledge generating station.
- During limited times of the year, water is extracted directly from the Puntledge River, just downstream of the generating station. The raw water is then chlorinated and distributed by the Region to Local Service Areas in the three Electoral Areas and the municipal delivery systems of Courtenay and Comox. The CVRD currently charges all water purveyors it provides a bulk rate of \$0.47/1000 litres.
- Allen Lake (drawn at Perseverance Creek) and Henderson Pond (drawn at Cumberland Creek), fed to four main reservoirs, and distributed via two 300 mm supply mains to residents in Cumberland and the Royston Improvement District which serves residents in the Royston area of Electoral Area A - Baynes Sound. The Royston Improvement District supplies its customers through bulk water purchases from Cumberland Public Works. In 2003 the Village of Cumberland added a license to the waters of the Vanwest Lakes to bolster its water supply. Cumberland currently has water licenses for extraction at a rate of 9690 m<sup>3</sup>/day up from its former license of 5,673m<sup>3</sup>/day.
- Langley Lake serves as the water source for the Union Bay Improvement District from Spindrift to Fraser and Gartley Point to Kentwood. The Union Bay Improvement District 's water license is for 20.5L/s.
- Tsolum River is the water source for the Mission Hill area of Courtenay and is provided by the Sandwick Improvement District through an infiltration gallery<sup>2</sup> adjacent the river.
- Watutco Enterprises Ltd. Draws water from the Oyster River to supply the Saratoga Beach Area.
- Cowie Creek and two source wells provide the source of water for Tstable River and south to the Ship's Point Improvement District. This water is provided by Fanny Bay Waterworks.

- Three groundwater source wells provide water for the Ship's Point Improvement District, whose general boundaries are Ships Point Road, Tozer Road, Baynes Drive, Vivian Way and Wentle Way.
- Mount Washington's water is drawn from private wells.
- The sources of water for the Bates Beach Boathouse, Mosley Road Water Supply Society, 0698013 B.C. Ltd., Alders Beach Resort, Tranquility Bay Water, Black Creek / Oyster Water are not available at this time. This information is expected to become available as the Water System Inventory, undertaken as part of the Regional Water supply strategy, progresses.

The information provided above should not be taken to be a definitive list of water users in the Comox Valley RGS area, but rather an attempt to briefly describe the major systems in operation.

## Comox Lake Regional Water System

Water is drawn from an intake at the Puntledge River through transmission (supply) mains to the Regional chlorination facility where the water is chlorinated to standards set by the Canadian Drinking Water Guidelines. Next, water is pumped to reservoirs closer to the Courtenay, Comox and the Local Service Areas. Transmission mains that run under or along streets take water from the reservoirs through cities, towns and villages. Distribution mains deliver water from transmission mains to individual houses or buildings.

## Jurisdiction

In British Columbia, the provision of water is regulated by over 20 federal government bodies, seven provincial agencies, 29 regional authorities, 157 municipalities, over 200 improvement districts, numerous crown corporations and non-governmental organizations. For the purposes of growth planning in the Comox Valley, the following governmental bodies and organizations have direct relevance.

## Federal and Provincial

### Federal and Provincial

The following table lists the federal and provincial ministries that touch on water.

	Ministries	Primary Area of Water Jurisdiction
Provincial Ministries	Ministry of Health	water quality standards
	Ministry of Environment	"water licenses (in concert with Integrated Land Management Bureau); water supply management "
	Ministry of Forests and Range	forestry and grazing practices affecting water quantity and quality
	Ministry of Agriculture and Lands	agricultural practices affecting water quantity and quality
	Ministry of Transport	subdivision approval authority, roads and highways
	Ministry of Energy, Mines and Petroleum Resources	energy, mining and petroleum extraction affecting water quality and quantity
	Ministry of Community Services	regional and community planning; water system planning
	Integrated Land Management Bureau	provincial land use and resource management planning
	Vancouver Island Health Authority	VIHA Drinking Water Officer administers the regulations of the Drinking Water Protection Act
Federal Ministries	Environment Canada	"national water quality standards; health of fisheries; First Nations drinking water supply; water infrastructure "
	Department of Fisheries and Oceans	fishery and ocean regulation
	Department of Indian Affairs and Northern Development	water on First Nations reserves
	Department of Agriculture and Agri-Food	"agricultural practices affecting water; protection and enhancement of agricultural water supply"
	Transport Canada	federal highways; marine transportation
	Health Canada	national drinking water and food processing guidelines

Figure 7.2

## **Regional Districts**

Regional districts are the planning authorities for rural, unincorporated areas. As such, their decisions directly affect water use and water provision. Regional districts have historically negotiated with residents of their unincorporated areas to determine the level of service provision. Regional districts are also responsible for the creation of regional growth strategies which direct the location and nature of growth within their boundaries. Regional district services, such as water, are one of several important topics that Regional Growth Strategies must engage.

The CVRD, as a water operator licensed by the Ministry of Environment, distributes water directly to several Local Service Areas in the three Electoral Areas and sections of Denman Island. In addition, the CVRD distributes bulk water to Courtenay and Comox, which in turn distributes it to residents through their municipal delivery systems. In addition, certain areas in the valley receive water via an Improvement district.

## **Municipalities**

Under the Local Government Act (2006) municipalities have the authority to provide water to residents. Municipalities can obtain water directly from a water source through a water license, or indirectly through another operator, such as a Regional District. Water provision considers infrastructure costs and water capacity, which is regulated through licensing. Municipalities are also responsible for land use planning decisions that directly affect water use and water service provision. In the CVRD Comox and Courtenay obtain their water from the CVRD directly, while Cumberland obtains its water from Allen and Henderson Lakes.

## **Improvement Districts**

Improvement districts are autonomous local authorities governed by elected trustees focused on providing services to local landowners. They are granted, through provincially issued Letters Patent, powers to provide specific services to an area within a set boundary. These powers include the ability to enact and enforce regulations and charges, to assess and collect taxes, to acquire, hold and dispose of lands, to borrow money and to expropriate lands required to carry out its functions. Improvement Districts must conform to regional growth strategies.

The RGS study area includes five Improvement Districts: Ship's Point Improvement District, Fanny Bay Waterworks District, Union Bay Improvement District, Royston Improvement District and Sandwick Improvement District. Water is the primary service provided by each of these Improvement Districts.

## **Private Water Utilities**

Persons or businesses that own or operate equipment or facilities for the delivery of domestic water - are also permitted to provide water within the Province of British Columbia. The Ministry of Environment regulates these utilities.

There are a number of private water utilities in the CVRD: Watutco Enterprises Ltd, Mount Washington Alpine Ski Resort Ltd., Bates Beach Boathouse, Mosley Road Water Supply Society, and 0698013 B.C. Ltd., Alders Beach Resort, and Tranquility Bay Water.

## **Private Wells**

Areas are found in Merville, Dove Creek, Point Holmes, Plateau Road, and other rural areas throughout the CVRD where private residents supply water to their homes independent of a public or private water operator, usually via private wells.

## Water Supply Related Policies

This sub-section provides a summary of local and regional water supply related policies.

### Rural Comox Valley OCP

The CVRD's Rural Comox Valley OCP contains a number of policies related to the conservation of water supply and reduction in water demand. The OCP places a priority on the protection of water resources, as the plan's second overarching goal is to "protect the quality and quantity of ground water and surface water." This goal is supported by several policies.

One Environmental Quality Policy states:

- The land use policies in the Plan shall work to ensure an adequate supply and quality of water for fish bearing streams and existing settlement and economic activities.

Local Community Service, Tourist Services and Highway Services, and Industrial policies set out that the criteria for evaluation of proposals for new development shall include:

- Compatibility of intended use with adjacent land and water uses and natural resource areas;
- the provision of adequate water supply

Further objectives and policies supporting the goal of supply protection and the reduction of demand include:

- To reduce potable water consumption
- Water meters shall be encouraged to be installed on all community water systems.
- Low flow appliances and fittings shall be required in all new dwellings or structures to promote reduction in potable water consumption.
- Land owners, local municipalities and senior government agencies shall be encouraged to work cooperatively with the Regional District in the undertaking of water supply studies to

identify future demand for water both from resource industries, in particular agriculture, and from residential and other urban land uses, and determine the most economically and environmentally appropriate methods of meeting future water needs of the Comox Valley.

- Working cooperatively with land owners, local government, senior government agencies, non-governmental organizations and the public on the water supply study

The CVRD has several other important non-OCP bylaws relating to water demand and supply:

- The Regional District of Comox-Strathcona Water Supply Development Cost Charges Bylaw 2001 and subsequent 2006 amendment create a development cost charges structure to provide funds to assist the CVRD to pay the cost of providing, altering or expanding water facilities, increasing supply or building storage improvements.
- Bylaw 2867 is a three stage water conservation bylaw which places residents on an odd/even day alternating lawn watering schedule and restricts lawn watering and other activities such as filling pools during times of peak demand. There are also a number of other bylaws governing water fees and bulk water rates.

### Courtenay OCP

The City of Courtenay also has a number of policies governing water supply:

- Only make municipal water and/or sewer services available to areas within municipal boundaries.
- Continue to lead efforts in storm water management, water supply, garbage and sewage disposal to protect the environment
- Seek methods to continue to protect the Comox Lake Watershed
- The City supports the protection of groundwater sources and surface water supplies

One significant aspect of the Courtenay OCP water supply policy is the incorporation of the Water Balance Model, a stormwater management system that encourages the retention of stormwater for reuse within developments. The City has several policies supporting this model of development.

Most importantly the Courtenay OCP has an entire section on water supply that contains a number of strong policies:

- The City is committed to maintain a program of establishing looped mains and to replace undersized mains where required.
- For new development, a computer evaluation of system improvements is required, concentrating on reservoir locations, water main sizing and distribution.
- The Comox Valley Water System [will] not be expanded beyond the current boundaries, prior to an area becoming part of a municipality.
- The City [will] not support any increase in the capacity or extension of the water system outside a municipal boundary.
- The City support implementation of a water-metering program for all properties within the water system.

#### **Comox OCP**

Policies concerning water supply and demand are also found in the Town of Comox's OCP:

- The Town does not support any major water consuming use that would jeopardize the fish bearing capability of watercourses.
- Where practical, all new development and redevelopment requiring potable water service must be connected to the Town's water system.
- Upgrade the water distribution system as identified in the Town's Water Report and if necessary update the Water Report every five years.
- Maintain and investigate expanding water conservation measures, including the implementation of universal metering.
- Conduct a regular review of the Town's water service model to ensure adequate supply of water for future growth.

Beyond the OCP policy the town of Comox also address water supply and demands through these other provisions;

- The Comox subdivision and development servicing by-law requires metres for SFO containing secondary suites.
- Third reading is given to amendments to require metering for all SFO, Commercial, Multifamily and Institutional for all SFO.
- Commercial, Multifamily, Industrial and Institutional buildings are required to be metred.

#### **Cumberland OCP**

The Village of Cumberland's OCP has the fewest policies related to the preservation of water supply and water demand management. The OCP has the protection of the "quality and quantity of groundwater and surface water," as a primary land use principle, in addition to the objective to:

- Protect the fish-bearing capacity of local waterways from negative impact by new development through the application of a variety of environmental standards including water conservation where appropriate.

Cumberland's OCP also seeks to reduce capital and operational costs through the employment of green infrastructure. Green infrastructure is defined in the OCP as "maintaining and designing natural landscapes within developed areas that utilize the capabilities of soil and vegetation to absorb and filter stormwater." However, except for these policies pertaining to site design techniques which effectively manage stormwater, there are no polices that directly address water conservation through community organization or demand management techniques.

## Issues

**The Role of Water in Growth** – Population and employment growth cannot occur in the Comox Valley without an adequate supply of water. Emphasis must be placed on the location and phasing of future development, in relation to servicing capacity and infrastructure. Water plays a special role in planning for regional growth and development. Because its supply is a prerequisite of development, the provision of water to an area is one way to expedite or catalyze growth in that location. Likewise, restricting the provision of water to specific sensitive areas is a strategic means of ensuring that development does not occur in such places. It should be noted that in the Electoral Areas there is no stormwater system for land clearing activities.

**Supply and Demand** – A number of additional water-related issues present themselves when considering the future growth of the Comox Valley. Ultimately, these issues come back to the question of supply. The available supply of water in each area of the Comox Valley will ultimately determine the amount of development that can occur. Nearly as important is the issue of cost. While it may always, in theory, be possible to find water for development (you can always drill deeper, transport over greater distance, or use more advanced technologies to obtain it) in reality, costs, both economic and environmental, will determine whether or not water is available.

**Demand is also a key consideration** – Methods of engineering and design can play a great role in the amount of water consumed by a given development. Traditional development is water and infrastructure intensive. The sprinkling and irrigation of extensive gardens, lawns and golf courses causes such a draw on water resources in the Comox Valley that water consumption increases from an annual average of 675 litres per person day to nearly 2000 litres per person per day during the driest summer days. The average Canadian uses approximately 630 litres /day. This figure includes water for residences, small commercial and industrial buildings, water lost through leaks and water used for

fire fighting. Considering only household water use, the average Canadian uses around 340 litres per day. This is an extremely high number, given that humans only require five litres on a daily basis for survival, or 60-80 litres when we consider sanitation, food preparation and bathing. Water consumption levels of Comox Valley residents are twice as high as the average person in France and eight times as high as the average Dane.<sup>3</sup>

By planning development intelligently and efficiently, water use can be reduced dramatically. Further reductions are possible through water conserving methods of engineering, architecture, urban design and landscaping. Just as importantly, changing the water consumption behavior of people in the region can lead to a dramatic reduction in water use.

**Lot size** – The sprinkling and irrigation of lawns, filling of swimming pools, washing of cars and driveways, can account for between 50 -70 percent of household water use annually. Lawn watering alone can easily make up 50 percent of household water usage. This largely accounts for the tripling of Comox's water consumption levels during the summer. A study of water usage in Seattle found that an increase in density from 4 housing units per acre to 12 housing units per acre led to a 158 percent decrease in water used for landscaping. This was attributed to a decrease in private landscaped open space. There have been similar findings for cities across the United States and Canada. The implication is clear: homes set on large open lots require vastly larger amounts of water on an annual basis.

Additionally, homes on larger lots require more expensive infrastructure, as the distance between buildings and transmission mains is invariably greater. This distribution infrastructure accounts for higher share of total infrastructure and pumping costs than does transmission infrastructure.

**Density and leakage** – The leakage of water delivery systems is a widespread problem. No system is completely watertight. Depending on their age, quality of construction and maintenance,

water systems on average can lose between 6 to 25 percent of their total flow through breaks and leaks. The City of Montreal is famously now losing a full 40 percent of its potable water through its crumbling water mains.

Aside from age, length and system pressure are the two important determinants of leakage. Longer systems with more pipes and more connections tend to leak more than shorter ones. Higher pressure must be maintained on systems that transport water over greater distances. Thus, developments that are lower density and more spread out will likely require longer systems, whereas shorter systems serving compact development can be much more water efficient.

**New vs. Old Infrastructure Investment** – The Canadian Waterworks Association and the Federation of Canadian Municipalities recognize a growing gap in infrastructure spending in BC. This means a growing backlog in infrastructure in need of repair or replacement. According to the FCM, over 33 percent of water distribution infrastructure in Canada's older cities reached the end of its service life in 2002, with another 34 percent set to reach that state by 2020. Governments at all levels will have to develop new means of financing the replacement of these ageing pipes, pumps, reservoirs and treatment plants.

Investment in new infrastructure rather than older failing infrastructure can perpetuate this problem, if crucial municipal resources are diverted from needed repairs. The extension of regional and municipal infrastructure to development in new locations can absorb funds more prudently spent renovating existing infrastructure and adds an additional burden on taxpayers to cover long term capital and operational costs. Additionally, the capital and operational costs of infrastructure vary directly with proximity to existing development. For every kilometer a building or neighbourhood is from a central pumping facility, the more expensive its services will be.

Development that occurs within the existing service area, can often take advantage of existing excess water system capacity; distributing the system's capital costs over an enlarged tax base, and reducing the costs per resident. Where development within a water service area must add capacity, or requires additional or upgraded infrastructure, it can provide an invaluable source of funding to alleviate municipal infrastructure deficits. Development within or immediately adjacent to existing urban areas can thus be an effective means of financing the replacement of ageing water infrastructure while cutting the overall costs of water provision.

**Water Quality** – In addition to the supply of water, the collection and management of stormwater is an important component of ensuring the overall health of the Comox Valley waterways and natural areas. As development occurs and impermeable areas increase, stormwater management becomes a larger concern. Modern management techniques are moving from engineered solutions to replication of natural collection and cleaning of water (e.g. ponds, grading). This approach can be further enhanced through increasing the amount of permeable areas required in new developments.

# Sewer

The provision of sewer services shares a number of similarities with the provision of water services. Sewage treatment is among the most elementary services provided by local governments. The disposal of sewage or liquid waste is of such importance that it is a prerequisite of new development. Guiding the extension of trunk sewer services to the appropriate location at the appropriate time is a strategic means of controlling the pattern of growth.

While not always the case, large trunk sewer services are generally laid at the same time as water transmission mains. Decisions concerning these services are best made in tandem. However, within the Comox Valley there remain a number of exceptions to this general rule. Sewer services are not always communal; many rural villages still provide for sewage through private septic systems. This occurs even in areas which are serviced by communal water systems, such as those provided through Improvement Districts or private water utilities.

However, regardless of the manner in which provided, sewer services are a critical element to consider in planning for the future development of the Comox Valley. These infrastructure decisions must be guided by a solid understanding of where and how the people of the Comox valley want growth to occur.

## Sewer Systems in the Comox Valley

There are presently three communal sewer systems in operation in the Comox Valley. One system serves the City of Courtenay, the Town of Comox and CFB Comox, a second services a subdivision on Jackson Drive, and a third serves the Village of Cumberland. The first two systems are owned and operated by the CVRD,

while the Village of Cumberland operates the latter. The sewage disposal needs of those areas of the Comox Valley not contained within these three service areas are presently provided for by small, private septic systems. The three communal water systems are below below:

### 1. Courtenay, Comox and CFB Comox Sewer Service

The City of Courtenay and the Town of Comox maintain separate sanitary sewer collection systems and storm sewer systems within their municipal boundaries. The sanitary sewer collection systems discharge sewage into the Regional sewer system at local lift stations.

Daily, over 14,000 cubic meters of sewage from these municipalities and the Canadian Forces Base is transported via two forcemains to the Comox Valley Water Pollution Control Centre (CVWPCC). This secondary treatment facility was constructed in 1984. Treated effluent from the plant is released three kilometers from shore in the Strait of Georgia in 80 meters of water. The plant's sludge is composted using aerated static piles, and a portion of this material is incorporated into the CVRD's innovative biosolids composting program. The final product is sold as a nutrient rich compost under the brand name, Skyrocket.

### 2. Jackson Drive Sewer Service

This local package sewage treatment system was requested of a developer of lands along Jackson Drive by the Regional District to replace an older, failing sewer system. The system is paid for by residents by means of a parcel tax.

### 3. Cumberland Sewer Service

The Village of Cumberland maintains its own separate sewer system. Wastewater from this combined sanitary and storm sewer system is treated through an aerated sewage lagoon. Treated effluent is discharged to Maple Lake Creek, and a settling pond is utilized to store final precipitates. The Village is in the process of completing a Liquid Waste Management Plan. The plan will likely result in the recommendation of significantly expanded treatment facilities, and the separation of combined storm and sanitary sewers to increase the capacity of the existing sewage treatment system and sewage lagoons.

## Current Projects

In addition to these sewer systems the CVRD has, in the past several years, been working in the creation of Liquid Waste Management plans with the goal of creating communal sanitary sewer systems in certain areas. The Saratoga Beach and Miracle Beach communities began a Liquid Waste Management planning process in 2001 that went through initial planning phases, but was ultimately voted down in a referendum. Royston and Union Bay went through a similar process from 2003 to present. Although the Liquid Waste Management Plan has been approved, federal and provincial funds to begin construction have, as of yet, not been forthcoming. The communities of Marsden and Arden are also involved in the creation of Liquid Waste Management Plans.

## Jurisdiction

In Canada, there are two pieces of Federal legislation which pertain to municipal liquid waste disposal: the Canadian Environmental Protection Act, overseen by Environment Canada, and the Fisheries Act, overseen by the Department of Fisheries and Oceans. These govern the collection and treatment of liquid waste, especially as regards the discharge and disposal of raw and treated sewage.

In British Columbia, the Local Government Act and the Community Charter, overseen by the Ministry of Community Development enable local government to provide and plan for wastewater services. The actual process of sewage collection, treatment and disposal is regulated by the Ministry of Environment and the Ministry of Health. Through the Environmental Management Act and the Municipal Sewage Regulation, the Ministry of Environment regulates community sewer systems. Through the Health Act and the Sewage System Regulation, the Ministry of Health Services governs on-site septic systems.

Through OCPs, local governments plan for development and infrastructure. This includes the identification of suitable urban and rural areas, the expected sequence of urban / rural land development and the timing, location and phasing of trunk sewer services. In addition, regions and municipalities, through their OCPs, may choose to favour communal or individual treatment options.

Where OCPs do not contain detailed plans for sewage infrastructure, a Liquid Waste Management Plan, provided for under the Environmental Management Act, may serve to address these deficiencies. Liquid Waste Management Plans may be undertaken by municipalities or regional districts. They are composed of strategies to plan for future development, an implementation schedule, and operational certificates that ensure waste disposal conforms to Ministry objectives. The Regional Sewer Strategy will serve as a Liquid Waste Management Plan. It will be coordinated with the RGS to ensure consistency between growth management and sewage infrastructure

## Sewer Related Policies

This section reviews the policies of the local and regional governments OCPs regarding the provision of sewer services. While each local government has policies relative to the degree to which they have control over infrastructure, there are no specific policies dealing with the relationship between sewage infrastructure and the phasing or location of growth. None of the local governments in the Comox Valley set out the location or phasing of major sewer services as directed in the Local Government Act in any great detail. Nor do they pertain to the relationship between the provision of sewer services and the timing or pattern of growth.

### **Rural Comox Valley OCP**

The Rural OCP addresses sewers through several different types of policies:

1. The plan sets out policies restricting further development of unserviced subdivisions and only allowing developments serviced by community wastewater systems within Rural Settlement Areas.
2. The Plan lays out policies supporting innovative types of wastewater technologies.
3. The Plan also supports the creation of Liquid Waste Management Plans and Development Cost Charges Bylaws where:
  - The preparation, adoption and implementation of a Liquid Waste Management Plan for the rural electoral areas of the Comox Valley shall be supported.
  - Where deemed appropriate by a Liquid Waste Management Plan, Development Cost Charges, and Local Service Areas bylaws shall be considered as a means of ensuring the appropriate collection, treatment, and disposal of all wastewaters.
4. The plan outlines policies that demonstrate the intent of the region to work with other jurisdictions within the CVRD to accomplish the goals of the OCP. Finally the OCP directs that all Electoral Area Plans and Local Area Plans must address wastewater and stormwater.

### **Courtenay OCP**

The policies in the City of Courtenay's OCP reflect its lack of jurisdiction over sanitary sewage treatment, and pertain solely to collection and transmission:

- For major new developments, the City shall consider the downstream capacity of existing sewer mains to ensure adequate capacity.
- Efforts shall continue to reduce infiltration which has a negative impact on the treatment facilities.

- The Comox Valley Sewerage System will be limited to areas within municipal boundaries.
- The City through the development of a Master Sewer Strategy will develop strategies to facilitate providing alternative trunk networks and systems to transport effluent to treatment facilities.

The City's policies surrounding storm sewers are more comprehensive. As the City continues to use natural drainage courses as the primary storm drainage, policies focus on minimizing storm flows to these water bodies through the use of a Water Balance Model, protecting these riparian corridors from development, and "mitigating the impacts of development on the drainage system to protect the quality of the river systems" through the use of such technologies as oil and grit interceptors.

### **Comox OCP**

The Town of Comox has a single policy regarding sanitary sewer systems:

- where practical, all new development and redevelopment requiring sewage disposal must be connected to the Town's sanitary sewer system;

Its policies governing storm sewers are slightly broader:

- New developments are required to provide storm water collection; generally, storm water must connect to the Town's storm water collection systems;
- New developments may be required to provide facilities to limit negative impacts to fish and other aquatic habitat;
- Storm water run-off must be retained within its originating watershed, wherever feasible; and
- Storm water retention facilities may be used where required to minimize the downstream impact of storm water

## Cumberland OCP

The Village of Cumberland's OCP contains two wastewater related objectives:

- Ensure sanitary sewage collection, treatment, and disposal facilities are maintained to appropriate standards, and mitigate any environmental effects from these systems.
- Provide a system of stormwater drainage, which has zero net impact on the natural drainage systems.

The focus on green infrastructure throughout Cumberland's OCP is in large part to mitigate the infrastructure and operational costs of storm sewer provision. Within all Comprehensive Planning Areas, development applicants must demonstrate that site selection and planning have given consideration to:

- Existing infrastructure, including sanitary sewers, water supply lines and stormwater facilities (both formal and informal) and their relationship to the proposed development program;
- Opportunities and constraints for on-site stormwater management including factors such as natural storage and soil infiltration.
- Stormwater management must, among a number of other objectives, provide "for retention of 90 percent of more of total annual rainfall."

## Issues

**Density of Development** – The density of development is a key factor determining the cost of sewer systems. Lot size, road width, overall form and design of communities: all of these contribute to the outlay of sewer services. Infrastructure costs within new developments are the largest component of the total cost of new infrastructure. Compact development has been shown to reduce the costs of municipal infrastructure, minimizing the number of distribution mains and associated pumping and lift stations.

**Location of Growth and Infrastructure Investment** – While the costs of infrastructure within new developments can often be passed on to the eventual home and building owners by ensuring prices include those costs, the costs of the community-level

infrastructure required to service new growth, such as trunk sewer mains, are frequently passed on to the community as a whole. The strategic siting of growth is therefore of paramount importance in minimizing the tax burden placed on to community residents.

Investments made by Federal and Provincial governments in regional and municipal sewer systems have been dramatically reduced over the past several decades. The trend has generally been towards a shifting of the responsibility for infrastructure funding to regional and municipal governments. In many places this has resulted in a backlog of needed infrastructure investments.

In the Comox Valley, signs of needed sewage infrastructure investment have been visible for some time. Leaking septic systems continue to threaten the waters of Baynes Sound. As a result of septic system seepage, the Union Bay shellfish industry has been closed to harvesting since 1969, and other coastal fisheries remain threatened. It is clear that a strategy for infrastructure investment is needed.

Locating growth in or immediately adjacent to established communities can provide a vehicle for infrastructure investment. Properly funded, upgrades needed to service this growth can benefit residents of both new and existing development without adding an additional burden.

A 2002 study, published in the Journal of the American Planning Association, used an engineering cost model to determine the influence of density on the cost of sewer and water services. The study found that the total cost of servicing a house on a 0.25 acre lot in a compact development near the location where water was pumped and sewage was treated was \$143/yr. The same house, with the same demand on services, on a 1 acre lot in the same location would cost \$272/yr to service. Holding water and sewer use constant, if the house were moved to a 1 acre site far from the pumping and treatment facilities would increase to \$388 per year.

# Solid Waste

Solid waste services are another key piece of regional and municipal service delivery that are intimately tied to development. Growth in population and employment will entail growth in household, business and industrial wastes. However, unlike water and sewer services, the connections between municipal solid waste services and the form and location of growth and development are not as direct.

The issues surrounding municipal solid waste are primarily related to the scale of development and bulk of material produced, rather than the form that development takes. That said, properly planning growth in the region means ensuring that disposal, recycling and compost facilities are strategically located relative to new development and that land use planning supports regional solid waste programs and policies.

## Summary of Solid Waste Systems in the Comox Valley

### **Rural Comox Valley**

The CVRD currently has in place a number of wide reaching programs for waste reduction, administered through the Solid Waste Management Plan:

### **Public Education and Promotion**

Public education and promotion programs are coordinated through a regional education and promotion plan. Education initiatives include the Province's Eco Education BC program for schools and a Master Composter Program, which trains volunteers in community composting techniques to help in their neighbourhoods. The CVRD operates a Compost Education Centre in Courtenay that provides a demonstration ground for the regional biosolid waste program and wide ranging environmental action education for visitors

### **Reduction and Reuse**

To provide incentive for reduction and reuse, the Region is evaluating user-pay initiatives on a case-by-case basis. The CVRD is planning to promote reuse and repair centres in CVRD publications.

### **Material Collection and Recycling**

The CVRD currently runs a number of Multi Material Drop off Depots throughout the CVRD to facilitate the collection of recyclable materials.

### **Compost**

The CVRD operates a cutting-edge biosolids program where wood chips are mixed with the solid treated waste products from the wastewater treatment process and are composted into a usable nutrient-rich mulch for gardens. This product, marketed under the name Sky Rocket compost is available for sale to bulk retail outlets, developers, landscapers, nurseries or individual citizens.

The region is investigating means of incorporating green wastes – leaves, chipped wood, food waste into this program.

### **Town of Comox**

Emterra Environmental hauls Comox's refuse to the Pidgeon Lake Landfill. Weekly service is provided to approximately 3,150 homes. Comox has a one can, 121 litre, limit and charges a fee for the service.

In January 2008 Comox initiated curb side "blue box" pick-up for recyclables. The former public works yard where residents dropped off yard waste was also replaced in January 2007 with a curb side collection program. Curb side collection now picks up yard compostable such as leaves, grass or branches.

### **City of Courtenay**

Salish Disposal hauls Courtenay's refuse to the Pidgeon Lake Landfill. Salish also handles the City's Industrial, Commercial and Institutional waste. Weekly service is provided to roughly 6000 homes. There is a weekly limit of one 121 litre bag. A fee of \$7.50/month plus \$1.25 per additional bag is charged for households, \$6.50 for apartment units.

Salish also collects household recycling every second week through a residential blue box program. Households pay \$12 per year for this service. City residents can also drop-off recyclables to the Pidgeon Lake Landfill, at Multi Material Drop off Depot sites such as Thrifty Foods, Courtenay Country Market, and Driftwood Mall, or at the Courtenay Return Centre, which provides refunds for beverage containers. In addition, a number of private recycling firms offer recyclable collection to businesses and homes. There is no municipally offered centralized composting program.

### **Village of Cumberland**

Cumberland's refuse is hauled by Sun Coast Waste to the Pidgeon Lake Landfill. There is a two can maximum and residents are only charged extra if they exceed this maximum.

Cumberland residents can drop off recyclables at the Pidgeon Lake Landfill. At least one private company offers curbside recycling for a fee.

The Village does not have a centralized composting program.

### **Jurisdiction**

Federally, Environment Canada and the Department of Fisheries and Oceans regulate aspects of Municipal Solid Waste pertaining to transboundary (interprovincial, international) and oceanic movements of hazardous waste, hazardous recyclable material and non-hazardous waste through the Canadian Environmental Protection Act and the Fisheries Act, respectively. In addition, the DFO and Environment Canada set national standards for water quality which must be respected by landfills and waste treatment facilities.

In BC, the Ministry of Environment (MoE) regulates solid waste services through the Environmental Management Act. The Environmental Management Act establishes that regional districts have the authority to make bylaws regulating the management of municipal solid waste and recyclable material and to establish Solid Waste Management Plans. In addition the MoE has established a series of guidelines pertaining to the disposal of waste, such as Establishing Transfer Stations for Municipal Solid Waste and Landfill Criteria for Municipal Solid Waste. The British Columbia Water Quality Guidelines (Criteria): 1998 Edition (BCWQG), and the Compendium of Working Water Quality Guidelines for British Columbia (CWWQG), provide the criteria used to evaluate ground water quality around landfills.

The CVRD prepared an update of its Solid Waste Management

Plan in 2003. This plan regulates all aspects of municipal solid waste, from reduction and reuse, to public education and promotion programs, to material collection and landfill options. Through this plan, the CVRD oversees the region's waste management system.

In the CVRD, Emitterra Environmental is the licensed hauler for Courtenay and Comox, while Sun Coast Waste is the hauler for Cumberland. Solid waste collection in the areas of the region outside of Courtenay, Comox, and Cumberland is provided by private collection firms on a subscription basis.

## Current Solid Waste Related Policies

The City of Courtenay's OCP incorporates solid waste management policy. The Rural Comox Valley OCP establishes criteria for the evaluation of commercial development solid waste, and recommends that all applications within Development Permit Areas 6 and 7 should "include a plan for waste minimization and recycling during the construction phase". Solid waste management in the CVRD is governed by the 2003 Solid Waste Management Plan that outlines the status of and policies for solid waste management in the region. As such, it forms the basis for the above discussion of the waste management system in the CVRD.

The City of Courtenay OCP notes the City's priority to "continue

to lead in efforts to reduce the amount of solid waste going to landfill" through the following initiatives:

- Education, promotion, advertising
- Encouraging recycling
- Encouraging home composting
- Review user fees
- Supporting recycling facilities within major commercial and industrial developments
- Encouraging mandatory garbage collection for the Comox Valley

A single policy in the Town of Comox's OCP mentions solid waste. Specifically, it states that the municipality "does not envision the need for solid waste disposal or sewer waste disposal sites within the Town's boundaries."

The Village of Cumberland's OCP does not include policies on Solid Waste.

## Issues

**Growth and Solid Waste Collection.** The pattern of growth to a large extent determines the efficiency of municipal refuse and recycling services. Towns and rural areas with widely dispersed homes and businesses find it difficult to operate low cost, economically-efficient curbside collection. Growth which occurs in a sporadic fashion can exacerbate this problem, making rural areas more difficult and costly to service. Conversely, by focusing growth within or near existing urban areas, collection becomes more efficient, as trucks travel shorter distances to service the same population.

**Landfill Space.** With growth in the CVRD comes an increase in the amount of solid waste the region will have to manage. The anticipated closure of the Campbell River Waste Management Centre landfill, which currently takes in the waste from Campbell River north and west, including Quadra and Cortes islands will add significantly to the waste handled by the Pidgeon Lake Landfill. Plans currently involve the construction of a transfer station in Campbell River and the diversion of waste from Campbell River to the Pidgeon Lake Facility. This will decrease the lifespan of the landfill significantly from its planned year of closure in 2032. Space has been set aside for a new landfill on adjacent property owned by the CVRD. The new landfill is planned as a full modern facility with a liner, and leachate and landfill gas collection capabilities.

**Economic and Environmental Costs.** Landfills and waste collection systems are expensive to operate, and contribute to the overall tax burden placed on regional residents. They also entail enormous environmental costs. The process of collection itself is fossil fuel intensive; garbage trucks and other heavy machinery used at landfills emit large amounts of carbon dioxide and other environmentally harmful emissions. Gases, such as methane, emitted from landfills contribute to global warming, and in the Comox Valley account for 19% of the region's total Green House Gas emissions. Leachate from poorly designed and ageing landfills can enter the water table and cause additional environmental harm. This can be especially dangerous where hazardous wastes find their way into the general refuse stream.

Refuse is symptomatic of a larger system of unsustainable resource production and consumption. There are harmful environmental impacts throughout the supply chain of all consumer good, from the initial harvesting of raw materials to primary production, manufacturing, packaging and transportation. By focusing on demand-side measures (reduction, reuse and recycling strategies) impacts can be further mitigated.

# Points for Discussion

This section provides a series of policy ideas related to water, sewer and solid waste services for the RGS to consider. These ideas are based on a thorough review of technical reports and policy documents pertaining to regional district service systems in the CVRD, and a review of current growth patterns.

## **Plan and phase infrastructure extensions carefully**

The location of sewer and water services is a major factor in the siting of new development. Growth is more likely to occur where these services exist in abundant supply. Extending sewer and water mains to one development often has the side effect of catalyzing growth along the supply line, as development in these areas becomes easier to justify. This has historically been one of the main causes of urban and rural sprawl. One way to help ensure that development only occurs in appropriate areas is to concretely identify the key areas where growth makes sense, and phase development from existing serviced areas outwards. In this way, infrastructure extensions are guided by careful land use planning; phasing the extension of infrastructure reinforces the phasing of development. The following policies could be considered in the RGS:

- Ensuring that all Electoral Area and municipal plans contain maps with the location and planned phasing of trunk water and sewer services.

## **Encourage more cost-effective development**

Growth in the Comox Valley will require significant investments in infrastructure. Over their lifespan, these infrastructure systems entail large capital, operational and maintenance costs – costs which are passed on to the taxpayer. Sound fiscal management and regional planning should seek to mitigate these costs to the

greatest extent possible. Organizing development in an efficient pattern is a key means to achieve this objective. Development that is closer to existing communities, is more compact and effectively organized saves on water transmission and delivery, liquid waste collection and solid waste collection costs. The RGS could consider the following policy:

- Encouraging local governments to establish policies for successive development wherein locations closest to the already built up areas must be developed first, before other areas are considered.

## **Encourage and support water conservation**

As is the case in every jurisdiction in BC, water supplies in the Comox Valley are finite. In order to ensure an adequate supply of fresh water for humans, fisheries, and the rest of the natural environment, water conservation is by far the most cost effective strategy for the CVRD to consider. Water conservation means less demand at times of peak supply and in turn it means less investment is necessary in new and upgraded infrastructure. Simple planning measures, like reducing the lot size of new developments, can be very effective in saving water. The installation of water meters throughout the CVRD would also contribute to the positive effect. Replacing old, leaking water mains can increase efficiency of water consumption up to 25 percent in some locations.

In existing and new development the use of drought resistant crops in landscaping can reduce irrigation and sprinkling needs. A stormwater management system for new development, such as that embraced by the City of Courtenay and implemented in several commercial developments (Wal-Mart, Home Depot) sees developments take charge of holding and treating storm water runoff on site, allowing only clean and treated water back into the water system. The RGS could introduce some of these policies:

- Encourage all local governments to embrace a “Water Balance Model” approach stormwater management that requires developed sites to mimic natural systems for all new development.

- Encourage the use of drought resistant landscaping in public, commercial and residential developments.
- Encourage smaller lot development and support higher density development in existing town centres to help reduce lawn watering and manicured spaces.
- Continue supporting universal water metering.

### **Prioritize investment in infrastructure replacement**

Replacing ageing infrastructure in the Comox Valley could be made a top priority for regional investment. Leaking water mains and seeping septic systems are inefficient, costly, and harmful to the water table. The anticipated growth in the Comox Valley, if properly managed, can be harnessed to help cover the costs of replacing existing infrastructure. By locating new development within or proximate to existing development, existing systems are replaced or upgraded rather than having entirely new systems built. Consider, for example, the following ideas:

- Support directing a proportion of new development to existing town centres to reduce infrastructure servicing needs and leverage associated cost savings to improve and rehabilitate existing services.
- Encourage new development to aid in replacing ageing sewer infrastructure.

### **Turn waste into a renewable resource**

The Skyrocket compost initiative has been a resounding success, with the region not only selling out supplies faster than it can produce them, but turning the success of the program itself into a vehicle for public education. The region could embrace this story as a new business model. Liquid waste can have other uses as well – such as electricity generation.

The City of Prince George has recently installed five new turbines at its sewage treatment plant which burns compressed gas emitted from the sewage and is reconstituted to produce 40 percent of the plant's power. The cost of the investment is expected to be offset by utility savings in nine years. The

new Pigeon Lake landfill is planned to incorporate a similar technology, capturing and burning the landfill gasses to create electricity. These technologies have the additional benefit of reducing the amount of atmospheric carbon created.

Recyclable and compostable materials are also valuable renewable resources. By embracing a Zero Waste Strategy, the region could announce its commitment to a more sustainable economy, and begin the transition in earnest. A re-examination of user pay fees would be a key part of this strategy, ensuring that it is as easy for citizens to compost and recycle. A properly structured user pay system can support a more effective, wider reaching, and inclusive system of collection and processing. A regional and municipal purchasing policy designed to support sustainable consumption and waste management practices is another key action for consideration. The following policies could be established.

- Formally endorse a Zero Waste Strategy and begin planning efforts to achieve it.
- Investigate the possibility of lowering property taxes in direct proportion to increased fees for curbside garbage collection.
- Become a leader in landfill gas recovery and electricity generation when the new Pigeon Lake landfill is constructed by ensuring a high environmental standard of design.
- Explore the potential of capturing landfill gases at the existing Pigeon Lake facility.