Maura Walker & Associates
ENVIRONMENTAL CONSULTANTS

Capital Regional District

Solid Waste Management Plan
Existing Solid Waste Management System

Prepared by:
MWA Environmental Consultants Ltd.

In association with:
Jeff Ainge and Associates Inc.

May 7, 2018

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ENVIRONMENTAL CONSULTANTS

May 7, 2018

Anke Bergner
Environmental Resource Management
Capital Regional District
625 Fisgard Street
PO Box 1000
Victoria BC
V8W 2S6

Dear Ms. Bergner,

Re: Existing Solid Waste Management System Report

We are pleased to submit the DRAFT report that describes the existing solid waste management system in the Capital Regional District and provides a review of the implementation status of the current Solid Waste Management Plan. It is expected that the information contained in this report will be enhanced by input from Regional District staff and the Solid Waste Advisory Committee. The final version of this report will become an appendix to the Solid Waste Management Plan.

We appreciate this opportunity to be of service and look forward to working with you on this planning process.

Yours very truly,

MWA ENVIRONMENTAL CONSULTANTS LTD.

Maura Walker
Principal, Lead Planner

Executive Summary

The Capital Regional District (CRD) is undertaking a review of the 1995 Regional Solid Waste Management Plan (SWMP). The *Environmental Management Act* mandates regional districts to develop plans for the management of municipal solid waste and recyclable materials. The purpose of the SWMP is to provide the CRD with a guiding document that will direct the Region's solid waste management activities over the next 10 years, while also considering longer-term objectives and opportunities.

This document outlines the implementation status of the 1995 Plan and describes the current waste management system in the CRD. This information will be used as the baseline for developing an updated SWMP.

From 1989 to 2016, the CRD reduced the per capita disposal at Hartland from 671 kg per capita per year down to 348 kg per capita; a reduction of 48%. In 2016, there was 133,196 tonnes of solid waste disposed at Hartland landfill. The implementation of a kitchen scraps disposal ban in 2015 resulted in a 6.6% decrease in organic waste being landfilled in 2016.

Waste composition studies conducted by the CRD at Hartland landfill indicate that the largest components of waste currently being landfilled (by weight) are organics, paper, plastic and wood.

Solid waste activities in the CRD include: curbside collection services, recycling depots, return centres for Extended Producer Responsibility (EPR) products, reuse opportunities, transfer stations, recyclables processing facilities, yard and garden waste composting facilities and two landfill sites. These activities are undertaken by public, private and non-profit organizations and are reflective of a complex and mature solid waste management system.

The annual budget for the CRD's solid waste services was $19.5 million in 2016, which includes all activities at Hartland landfill and all solid waste diversion programs. The solid waste services are funded primarily through tipping fees revenue (69% of revenues). The CRD's curbside recycling collection of packaging and printed paper is funded through an EPR program, which accounts for 24% of revenue. Additional revenue is received through the sale of recyclables and energy generated by landfill gas.

This report describes the system as it exists in 2018. A previous report was prepared in 2012; however, the process to update the SWMP was put on hold from 2015 to 2017. A number of changes have occurred since that 2012 report was prepared. Many of the issues that were identified in the previous report have been resolved and new challenges have arisen. These challenges are described at the end of relevant sections.

Glossary

Term	Definition/Description
Asbestos Containing Materials (ACM)	Materials common in older homes which can release harmful fibres into the air when disturbed such as during renovating and deconstructing houses. Examples of the most common asbestos containing materials include vinyl sheet flooring/vinyl floor tile, drywall joint compound (from drywall installed pre-1990), plaster and ceiling tile, stucco, and central heating taping, wrap and gaskets from furnaces. Asbestos containing material (ACM) is accepted by appointment at Hartland Landfill
CD	Construction and demolition
CD Waste (also referred to as C&D, and CR&D Waste)	Waste materials generated from construction, demolition and renovation activities. CD materials often contain bulky, heavy materials, such as concrete, wood, metals, glass, and salvaged building components.
Carpet	Carpet, rugs
Clean wood waste	Uncontaminated wood or wood products, from which hardware, fittings and attachments, unless they are predominantly wood or cellulose, have been removed (e.g., clean wooden shakes and shingles, lumber, wooden siding, posts, beams or logs from log home construction, fence posts and rails, wooden decking, millwork and cabinetry). Clean wood waste excludes: • Any engineered or chemically treated wood products, such as products with added glues or those treated for insect or rot control (oriented strand board, plywood, medium density fibre board, wood laminates or wood treated with chromated copper arsenate, ammoniacal copper arsenate, pentachlorophenol or creosote); • Upholstered articles; • Painted or varnished wood articles or wood with physical contaminants, such as plaster, metal, or plastic; • Any wood articles to which a rigid surface treatment is affixed or adhered. • Clean wood waste also excludes other materials found in the construction and demolition waste stream such as gypsum or drywall, fiberglass, asphalt or fiberglass roofing shingles, metals or plastics.
Composite materials	Packaging and products comprised of more than one type of material, such as plastic laminated to paper or foil. Examples of composite materials include dog food bags, children's toys made of plastic and metal, diapers, sanitary products, and bulky Items like luggage and sofas.
Compostable Paper Products	Fibre products and packaging which can be composted after use. Examples include soiled paper products, facial tissues, paper toweling
CRD	Capital Regional District
Dirty wood waste	Treated wood, painted wood. All wood products and materials that are not "clean" (refer to definition of "clean wood waste" above)
Disposal	Waste that is sent to landfill
Diversion	Waste that is generated but that is handled through recycling or reuse instead of being disposed.
EA	Electoral area
E-waste	Electronic waste
Extended Producer Responsibility (EPR)	An environmental policy approach in which a producer's responsibility (physical and/or financial) for a product is extended to the post-consumer stage of a product's life cycle. There are two key features of EPR policy: (1) the shifting of responsibility (physically and/or economically, fully or partially) upstream to the producer and away from local governments, and (2) to provide incentives to producers to take environmental considerations into the design of the product.
Fines	Cigarette butts, bottle caps, bits and pieces, etc.

Term	Definition/Description
Glass	Beverage containers (deposit and non-deposit bearing containers) Glass food containers (jars) Non-container glass (broken glass, picture frames etc.)
Gypsum	Drywall
HHW	Household Hazardous Waste: Includes items covered by stewardship programs (such as compact fluorescent light bulbs, paint, solvents, used oil and containers, batteries) and items not covered by stewardship programs
ICI	Industrial, commercial and institutional
ICI waste	Waste generated by institutions (such as schools), commercial establishments (such as stores, restaurants) and industrial establishments (light manufacturing)
Inert Waste	Dirt, rocks, ash
Kitchen Scraps	Compostable waste generated by residential, business, institutional and commercial sources such as fruits, vegetables, meat, meat by-products, dairy products, baked goods, cereal, grains, pasta, bones, egg shells, coffee grounds and filters, tea bags, nuts and shells, houseplants and cut and dried flowers, and soiled paper products such as paper towels, tissues, food packaging, plates and cups
Metal	Beverage containers (deposit and non-deposit bearing containers) Metal food containers (cans) Household metal (keys, nails, hangers etc.) Non-household metal (siding, pipes)
MF	Multi-family
MSW	Municipal solid waste: refuse that originates from residential, commercial, institutional, demolition, land clearing or construction sources, or refuse specified by a director to be included in a waste management plan (as defined in the Environmental Management Act, BC)
Organics	The portion of the waste stream that is considered readily compostable, including food waste, yard waste and compostable paper (non-recyclable paper such as paper toweling and facial tissues).
Pet Waste	Dog feces, cat litter box waste
Packaging and Printed Paper (PPP)	A product category defined under the BC Ministry of Environment Recycling Regulation requiring a Product Stewardship plan. Applies to residential recyclables only, broadly defined as: • Printed paper • Paper packaging • Cartons and paper cups • Steel containers • Aluminum packaging • Plastic containers • Glass containers • Expanded foam containers • Film plastic
Product Stewardship	A term used in British Columbia to describe a government strategy to place the responsibility for end of life product management on the producer and consumers of a product and not the general taxpayer or local government. Also known as Extended Producer Responsibility (EPR).
Recycling Regulation (Province of BC)	The Recycling Regulation under authority of the Environmental Management Act sets out the requirements for Product Stewardship in B.C. In some cases, producers of designated products may appoint a stewardship agency to carry out their duties in accordance with an approved plan.
Reduction	Waste that is prevented from being generated. This may be achieved through changes in consumption habits or changes in the way products are sold.
Residential waste	Waste generated by households

Term	Definition/Description
SF	Single family (up to and including duplexes, triplexes, fourplexes and may include townhouses with curbside access)
Textiles	Clothing, footwear, rags, cloth material
Waste management hierarchy	A concept that refers to the 5Rs of waste management: reduce, reuse, recycle, recover, residuals management. The hierarchy places greater emphasis on up-stream waste management activities, such as reduce and reuse.

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1 Introduction

The Capital Regional District (CRD) is undertaking a review of the 1995 Regional Solid Waste Management Plan (SWMP or Plan). The *Environmental Management Act* mandates regional districts to develop plans for the management of municipal solid waste and recyclable materials. The purpose of the SWMP is to provide the CRD with a guiding document that will direct the Region's solid waste management activities over the next 10 years, while also considering longer-term objectives and opportunities.

The CRD will use the Ministry of Environment's *Guide to Solid Waste Management Planning*, released in 2016, to ensure that the planning process meets the requirements of the Ministry of Environment. These guidelines replace ones previously released in 1994 and recognize that more flexibility in how plans are updated is required due to the broad range of solid waste management challenges and opportunities faced by BC regional districts. However, one of the key requirements of the Ministry remains that sincere, demonstrated consultation with affected stakeholders is incorporated into the planning process.

There are four steps to review a SWMP as set out in the *Guide to Solid Waste Management Planning*. The first step being the decision to initiate the planning process, establishing committees and developing a project budget. The second step is an assessment of the current system and a report on the implementation status of the 1995 Plan. The third step is the review of options to address the region's future solid waste management needs and the selection of preferred options. The final step will be a broad community and stakeholder consultation process to obtain input into the selected options. During each step of the planning process, the CRD will consult with their multi-stakeholder Solid Waste Advisory Committee.

This document outlines the implementation status of the 1995 Plan and describes the current waste management system in the CRD. This information will be used as the baseline for developing an updated SWMP.

1.1 The 5R Pollution Prevention Hierarchy

The province recommends that regional districts use the 5R pollution prevention hierarchy (Reduce, Reuse, Recycle, Recover, Residuals Management) to develop their solid waste management plans. The order of preference in the pollution prevention hierarchy is for waste management at one level to only be undertaken when all feasible opportunities for pollution prevention at a higher level have been taken. Figure 1-1 on the next page shows the hierarchy.

Figure 1-1: Pollution Prevention Hierarchy

1.2 Guiding Principles

According to the Ministry's guidelines, the SWMP should be founded on guiding principles, which are clearly stated in the plan. The Province has proposed eight guiding principles, listed below, for regional districts to follow in developing their solid waste management plan. These principles can be modified if a solid rationale is provided for any changes. Additional locally relevant guiding principles can be added to ensure that the principles are reflective of the CRD. It is anticipated that the Solid Waste Advisory Committee will consider these principles early in the process to update the CRD's SWMP.

1. Promote zero waste approaches and support a circular economy

Encourage a shift in thinking from waste as a residual requiring disposal, to waste as a resource that can be utilized in closed-loop systems. Zero waste approaches aim to minimize waste generation and enable the sustainable use and reuse of products and materials. At the local level, look to remove barriers or encourage opportunities that will contribute towards the establishment of a circular economy.

2. Promote the first 3 Rs (Reduce, Reuse and Recycle)

Elevate the importance of waste prevention by prioritizing programming and provision of services for the first 3 Rs in the 5 R pollution prevention hierarchy (see Figure 1-1). Encourage investments in technology and infrastructure, and ensure they occur as high up on the hierarchy as possible.

3. Maximize beneficial use of waste materials and manage residuals appropriately

Technology, best practices and infrastructure investments should continue to develop to recover any remaining materials and energy from the waste stream, and to manage residuals for disposal.

4. Support polluter and user-pay approaches and manage incentives to maximize behaviour outcomes

Producer and user responsibility for the management of products can be supported through the provision of market-based incentives, disposal restrictions on industry-stewarded products, zoning to support collection facilities, and support for reuse and remanufacturing businesses. Education and behaviour change strategies aimed at consumers and businesses will help foster further waste reduction, reuse and recycling. For example, user fees can be managed as incentives to increase waste reduction and diversion.

5. Prevent organics and recyclables from going into the garbage wherever practical

Maintaining a system to prevent organics and recyclables from going into the garbage will provide clean feedstock of greater economic value as well as a potential end product use to the recycling industry, while reinforcing behaviour to reduce, reuse and recycle. Innovation in separation solutions, establishment and enforcement of disposal restrictions or other creative means will influence this approach.

6. Collaborate with other regional districts wherever practical

Collaboration on many aspects of solid waste management (e.g., to access facilities and markets, share campaigns and programs) will support the most efficient and effective overall municipal solid waste system.

7. Develop collaborative partnerships with interested parties to achieve regional targets set in plans

Strengthen partnerships with interested parties to achieve regional targets. All waste and recycling service providers, industry product stewards and waste generators are key interested parties in achieving these targets. Cooperative efforts will optimize successful outcomes. Encourage a marketplace that will complement stewardship programs and drive private sector innovation and investment towards achievement of targets.

8. Level the playing field within regions for private and public solid waste management facilities

Solid waste management facilities within a given region should be subject to similar requirements. A consistent set of criteria should be used to evaluate the waste management solutions proposed by private sector and by a regional district or municipality.

2 Solid Waste Management Planning in the CRD

The CRD's first SWMP was approved by the Province in 1989. It was updated in 1991 and again in 1995. Since it was approved, eight amendments have been added to the Plan and most of the original goals have been achieved.

The Province of BC requested that the CRD update the 1995 Plan to reflect the changes that have been made since 1995, including the eight amendments and changes to the solid waste management system, such as the significant expansion of Extended Producer Responsibility as a means of managing solid waste. Updating the Plan will also allow for consideration of future options for solid waste management in the CRD within the current context and to create an updated vision.

In 2012, the CRD embarked on a process to update the 1995 SWMP. At that time, a separate advisory committee was formed, called the Public and Technical Advisory Committee, to provide input into the development of an updated plan. This committee reviewed a number of reports prepared by consultants, including a 2012 Existing System Report and technical memoranda outlining options for consideration in the new plan. This process, however, was put on hold in 2015 to investigate integrated resource management opportunities. In November 2017, the Board approved restarting the process to update the SWMP.

This report describes the system as it exists in 2018. Since the original 2012 report, a number of changes have occurred. Many of the issues that were identified in the previous report have been resolved and new challenges and opportunities have arisen. These changes are described at the end of relevant sections.

2.1 Implementation of the 1995 SWMP

Table 2-1 lists the key actions that were included in the 1995 Plan and subsequent amendments and the current status of those actions. The CRD has been actively pursuing all aspects of the 1995 Plan and amendments and has successfully implemented the majority of actions outlined in those documents.

Table 2-1: Implementation Status of 1995 Solid Waste Management Plan and Amendments

1995 Solid Waste Management Plan Component	Implementation Status
3Rs Components	
10.1.1 Maintain residential user pay garbage collection	Maintained. Limit of one can a week or every two weeks in municipalities that provide collection programs.
10.1.2 Continue to provide grants to non-profit repair and reuse organizations	Maintained.
10.1.3 Continue to operate reusable goods drop-off area at Hartland landfill	Maintained. Operated in cooperation with local non-profit organizations.
10.1.4 Continue with Green Bonus Program	Green Bonus Program was discontinued. CRD sponsors waste reduction award for an EcoStar event organized by a local non-profit organization.
10.1.5 Continue with Diversion Council	Council was discontinued in 2002.
10.1.6 Maintain the policy that once viable recycling alternatives have been identified for specific recyclables, that material will be banned from disposal	Maintained. CRD has banned a number of materials from disposal at Hartland Landfill since 1991.
10.1.7 Maintain $75/tonne tipping fee for approximately 3 years and adjust thereafter as required	Complete. Current tipping fees are $110/tonne.
10.1.8 Continue to provide residential curbside recycling service and add new materials when feasible. Continue with drop boxes in rural areas where curbside services are not provided	On May 19, 2014 a new province-wide Extended Producer Responsibility program for residential packaging and printed paper (PPP) commenced which shifted the responsibility for the management of these materials from local governments to producers. The CRD has entered into agreements with the stewardship agency, Recycle BC and has contracted the collection work to a curbside service provider and depot recycling societies. The drop box service was cancelled in 2000.

1995 Solid Waste Management Plan Component	Implementation Status
10.1.9 Continue to provide apartment recyclables collection and add new materials when feasible	The CRD apartment recycling funding program was discontinued as of May 19, 2014 when Recycle BC assumed responsibility for PPP management from multi-family dwellings.
10.1.10 Continue to operate municipal recycling depots at established locations	The municipal depot program was discontinued in 2001.
10.1.11 Discontinue plaza recycling depot program	Complete.
10.1.12 Continue to provide a recycling depot at the landfill and add new materials when feasible	The public drop-off area at Hartland accepts over 80 items from 28 product categories.
10.1.13 Continue to provide operating grants to Salt Spring and Southern Gulf Islands recycling depots	The CRD has entered into an agreement with Recycle BC and contracted PPP collection to local recycling societies on the islands. The CRD covers the funding shortfall for the collection services.
10.1.14 Continue telephone book recycling program	Discontinued in 2012. Telephone directories are accepted in the curbside recycling program.
10.1.15 Develop a diversion credit program	Requested proposals to receive diversion credits for mattresses, asphalt shingles and household batteries. No proposals received. No further initiatives are planned.
10.1.16 Monitor residential demand for home composters and initiate additional distribution when required	Over 27,000 home composters were distributed between 1992 and 2007. Units continue to be offered through CRD-funded Victoria Compost and Conservation Education Society.
10.1.17 Discontinue apartment worm composter distribution program	Complete.
10.1.18 Continue to promote worm composting in schools	Worm composting in schools continues to be promoted through the Victoria Compost Education Centre.
10.1.19 Continue to provide funding to the Victoria Compost Education Centre	Funding continues to be provided through a service agreement.

1995 Solid Waste Management Plan Component	Implementation Status
10.1.20 Move composting operation to the north side of the landfill site and, subject to funding and Board approval, establish an agreement with a private corporation to construct and operate an in-vessel composting plant	The composting operation was moved to the north side of the landfill (Willis Point) but the CRD Board did not ratify the agreement for the in-vessel composting plant. In 2002 the composting operation was discontinued and yard and garden waste is now collected in the public drop-off area, chipped and used on site.
Hartland Landfill	
10.1.21 Upgrade the gas collection system and potentially modify to allow for energy recovery	A revenue-generating landfill gas-to-electricity system has been constructed and began operating at Hartland landfill in January 2004. The landfill gas collection rate was 61.8% in 2016. The generator produces enough energy to power 1,100 homes annually.
10.1.22 Establish a quarrying operation to provide aggregate for internal use	On-going, as required.
10.1.23 Continue to accept screenings and waste sludge as controlled waste	On-going.
10.1.26 Continue to accept non-anatomical biomedical waste for disposal.	Only non-hazardous and non-anatomical waste from biomedical facilities is received for disposal at Hartland. Sharps from domestic sources are received as controlled waste.
10.1.27 Close Phase 1 and open Phase 2 in accordance with plans for the site and utilize the property for a number of other solid waste related functions	Complete.
Disposal	
10.1.28 Resolve the issue of including the Highwest Waste Recycler site in the SWMP by 30 April 1996	An independent technical review of the burning activities at the Highwest Waste Management Facility (HWMF) site was conducted. In 2008, the Ministry approved SWMP Amendment No. 6 which allows the inclusion of the HWMF into the SWMP. HWMF operate under a new Operating Certificate as a landfill and is no longer burning wood waste.

1995 Solid Waste Management Plan Component	Implementation Status
10.1.29 Prohibit the disposal of solid waste at any site within the region other than at Hartland landfill and any other sites listed within the SWMP	Hartland landfill is the only site in the region that accepts municipal solid waste for disposal. The HWMF (now owned by Tervita) continues to accept construction and demolition (C&D) debris under a new operating certificate.
11.1.2 and 11.1.3 Establish Land Clearing Debris receiving centres to accumulate waste, then burn the material under an operating certificate using an air curtain burner only. Review policy in 1998 with a goal of a total burning ban by 2000	No sites established. Given the goal of a total burning ban, no future burn site proposals are anticipated.
11.2.2 Examine the banning of yard waste once land clearing debris receiving centres have been established	No receiving centres were established. Yard waste burning continues to be subject to existing local burning bylaws.
11.4.2 No burning of demolition and construction waste is allowed, except at the HWMF	Burning of clean wood at the HWMF ceased in 2009.
11.5 Subject to Board approval, possibly purchase air monitoring equipment to monitor air emissions from the HWMF facility and to ensure that the electoral 'receiving centres are operating properly	Air monitoring equipment was not required because no electoral receiving centres were established and the HWMF ceased burning C&D waste.
Other Programs and Activities	
10.1.24 Maintain and continue with environmental education programs	Maintained. The CRD has a number of education and outreach programs. The Hartland Learning Centre opened in October 2011.
10.1.25 Household Hazardous Waste Management Paint Stewardship Program: Develop a permanent depot system within the region Other Hazardous Wastes: Work with industry and the province to provide safe disposal for batteries, pesticides, herbicides, reactives and corrosives	A network of depots, including Hartland, has been established in the region for paint, pesticides, solvents and flammable liquids. Additional hazardous materials are managed under stewardship programs (used oil, lead acid batteries, electronics, electrical products, batteries and lighting products). Since 2004, the Hartland public drop off area has been accepting residential quantities of household hazardous waste that are not covered under an EPR program.

1995 Solid Waste Management Plan Component	Implementation Status
12.0 Use a stepped approach to prevent the abandonment of waste materials collected for recycling	Step one, circulating storage limit guidelines to industrial property owners, was implemented in 1996. It has not been necessary to proceed with additional steps as further incidents of recyclable materials abandonment have not occurred.
13.0 CRD bylaw restricts the disposal of solid waste at Hartland landfill originating from outside the region and the plan is to only allow the HWMF and composting facilities to receive waste from outside the region	Bylaw remains in place. In 2007, the CRD Board authorized acceptance of out-of-region waste from the CVRD in the event of an emergency. Hartland Landfill accepts small quantities of asbestos containing materials from out of region.
14.0 Develop receiving sites and agreements with local haulers and recyclers to manage disaster debris.	Disaster debris management will be part of the CRD's emergency management plan.
Financial	
15.1 Funding for all landfill capital projects will be drawn using available funds in Bylaws 1905, 1994, 1604 and 1783 as well as funds generated from operations	All funding for capital projects has been, and continues to be, drawn from these sources. In 2008, the Minister approved SWMP Amendment No. 7 to allow for borrowing funds to finance Hartland capital works projects. Since 2012, capital works have been funded from the annual operating budget and the Sustainability Reserve.
15.2 All funding for the Solid Waste operating budget is derived from tipping fees, the sale of recyclable materials or other revenues generated from operations	The Solid Waste operating budget is currently funded from tipping fees, product stewardship programs and sale of recyclable materials and electricity.

Amendment 1 (2005)	Implementation Status
To allow the Capital Regional District (CRD) to regulate composting in the CRD through the adoption of a regulatory bylaw under Section 25 (3) of the *Environmental Management Act*.	Bylaw implemented
Amendment 2 (2001)	**Implementation Status**
To allow the Capital Regional District (CRD) to regulate transfer stations on Salt Spring Island through the adoption of a regulatory bylaw.	Bylaw implemented
Amendment 3 (2004)	**Implementation Status**
To modify the legal description of Hartland Landfill to include additional land that was acquired as a buffer strip.	Implemented
Amendment 4 (2004)	**Implementation Status**
Add a new Section 16.0 that outlines the CRD's public review process for solid waste related matters.	Implemented
Amendment 5 (2004)	**Implementation Status**
Establishes procedures for resolving conflicts associated with the Hartland Landfill.	Implemented
Amendment 6 (2007)	**Implementation Status**
Include the Highwest Waste Management Facility in the SWMP and set operating requirements (replaces Section 10.1.28 in the Plan). This section includes cessation of burning at the site by the end of 2009.	Implemented
Amendment 7 (2007)	**Implementation Status**
Replace Section 15.1 of the Plan with "Funding for all Hartland Capital Works will be borrowed through loan authorization bylaws or cash flow generated from solid waste operations in accordance with the CRD *Solid Waste Disposal Local Services Establishment Bylaws."*	Implemented
Amendment 8 (2013)	**Implementation Status**
To allow the siting, construction and operation of a biosolids treatment and resource recovery facility at Hartland Landfill for treatment, processing, storage and beneficial utilization of screenings and waste sludge.	In development

3 Plan Area

The Capital Regional District (CRD) is the regional government for 13 municipalities and three electoral areas, covering an area of 2,341 sq. km on the southern tip of Vancouver Island. A map showing the administrative boundaries of the CRD is provided in Figure 3-1.

Member municipalities include:

- Central Saanich
- Colwood
- Esquimalt
- Highlands
- Langford
- Metchosin
- North Saanich
- Oak Bay
- Saanich
- Sidney
- Sooke
- Victoria
- View Royal

Unincorporated areas are organized into electoral areas. The three electoral areas in the CRD are:

- Salt Spring Island Electoral Area;
- Southern Gulf Islands Electoral Area, which includes Galiano Island, North Pender Island, South Pender Island, Saturna Island, Mayne Island, and smaller islands in the vicinity; and
- Juan de Fuca Electoral Area, which includes East Sooke, Malahat, Otter Point, Port Renfrew, Shirley, Willis Point, and inland rural areas.

First Nations communities located within the region include: Beecher Bay, Esquimalt, Malahat, Pacheedaht, Pauquachin, Penelakut, Songhees, Tsartlip, Tsawout, Tseycum and T'Sou-ke Bands. Each of these Bands has reserve lands within the boundaries of the CRD as shown in Figure 3-2.

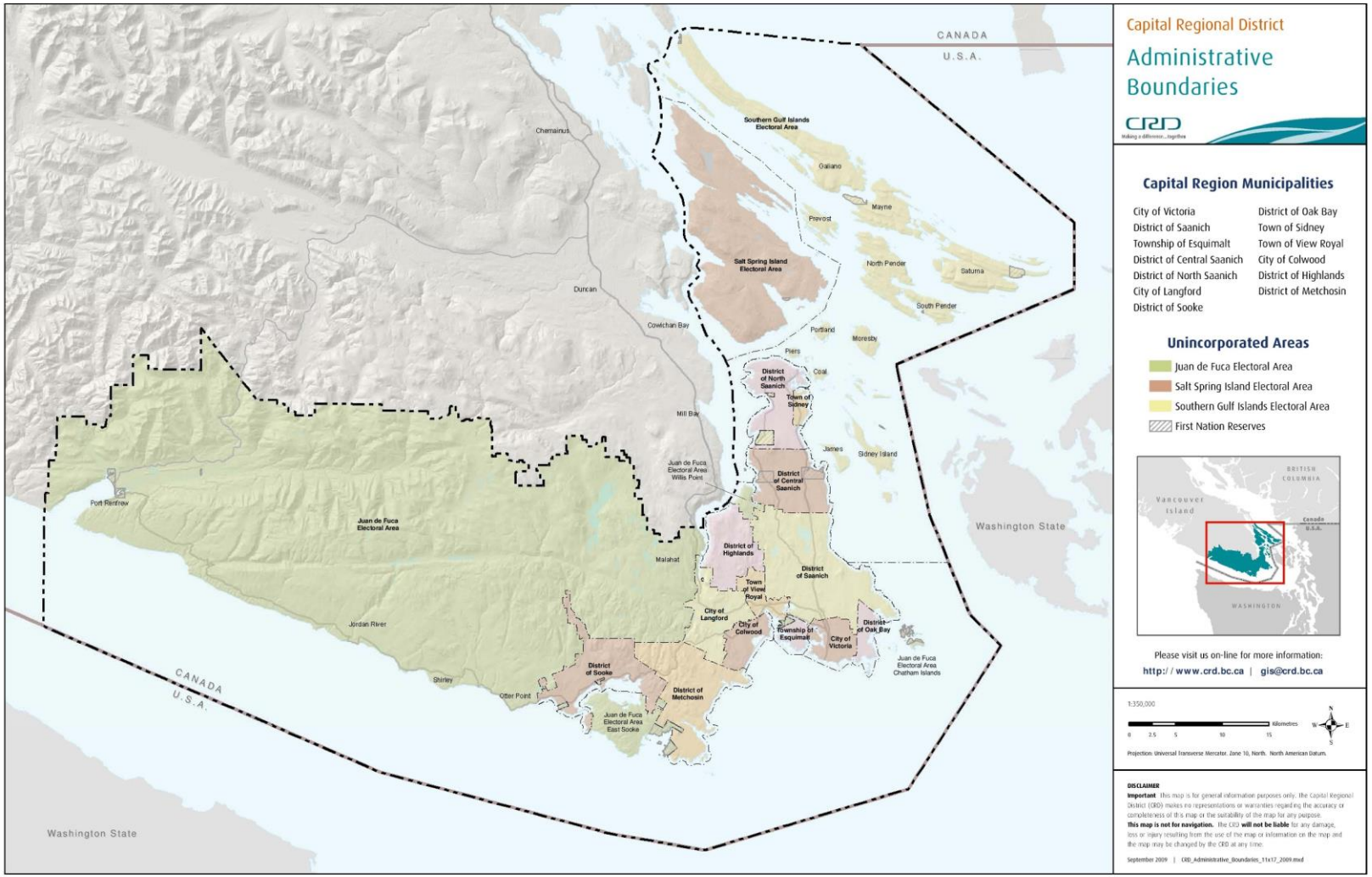

Figure 3-1: Map of the Capital Regional District

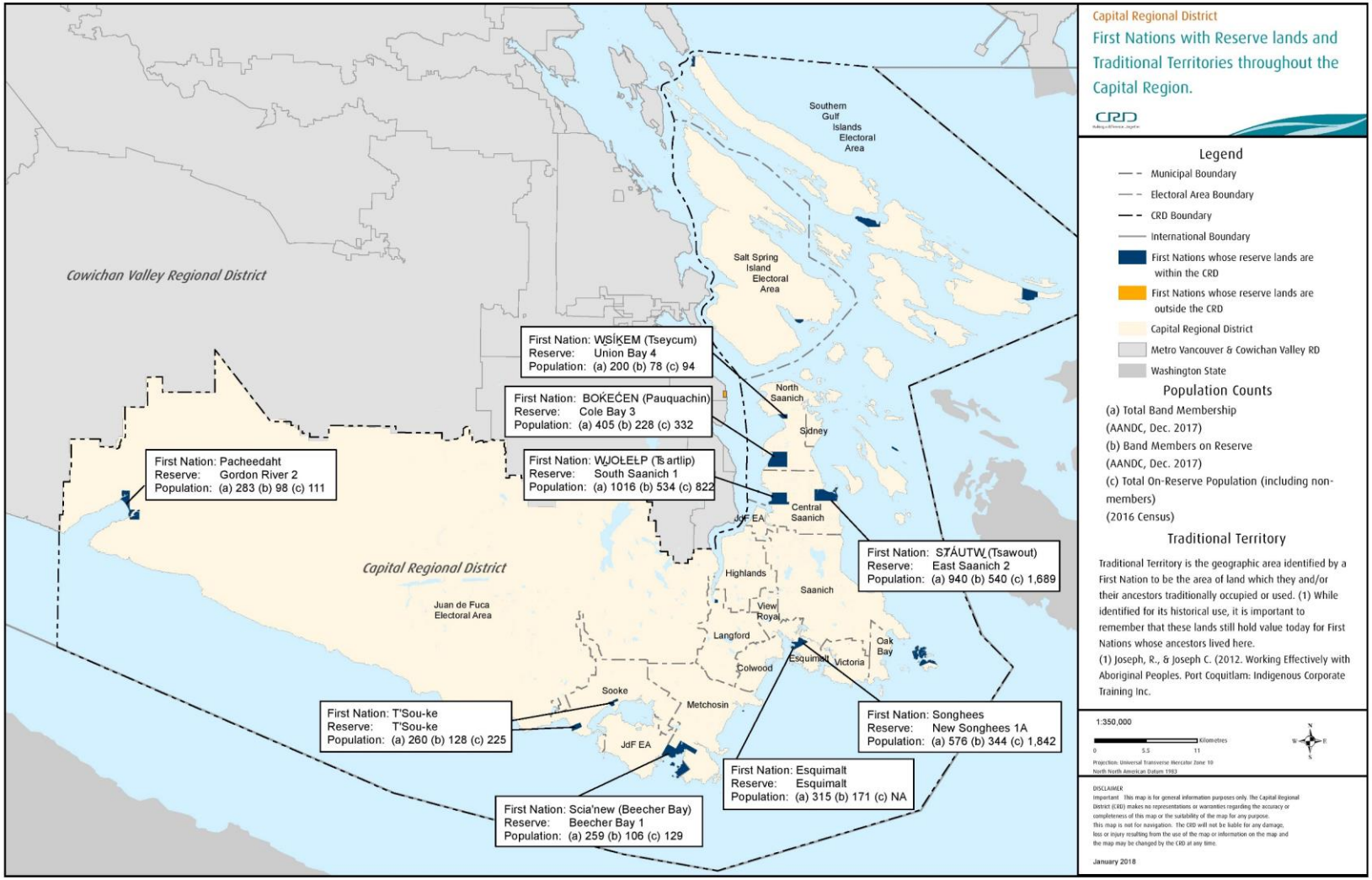

Figure 3-2: First Nation Reserves in the CRD

3.1 Population and Growth Estimates

There were approximately 383,360 people residing in the CRD in 2016[1]. Figure 3-3 shows the proportion of CRD population of each municipality and electoral area. Population growth estimates indicate that the CRD will grow by 11% by 2026 and by 20% by 2036.[2]

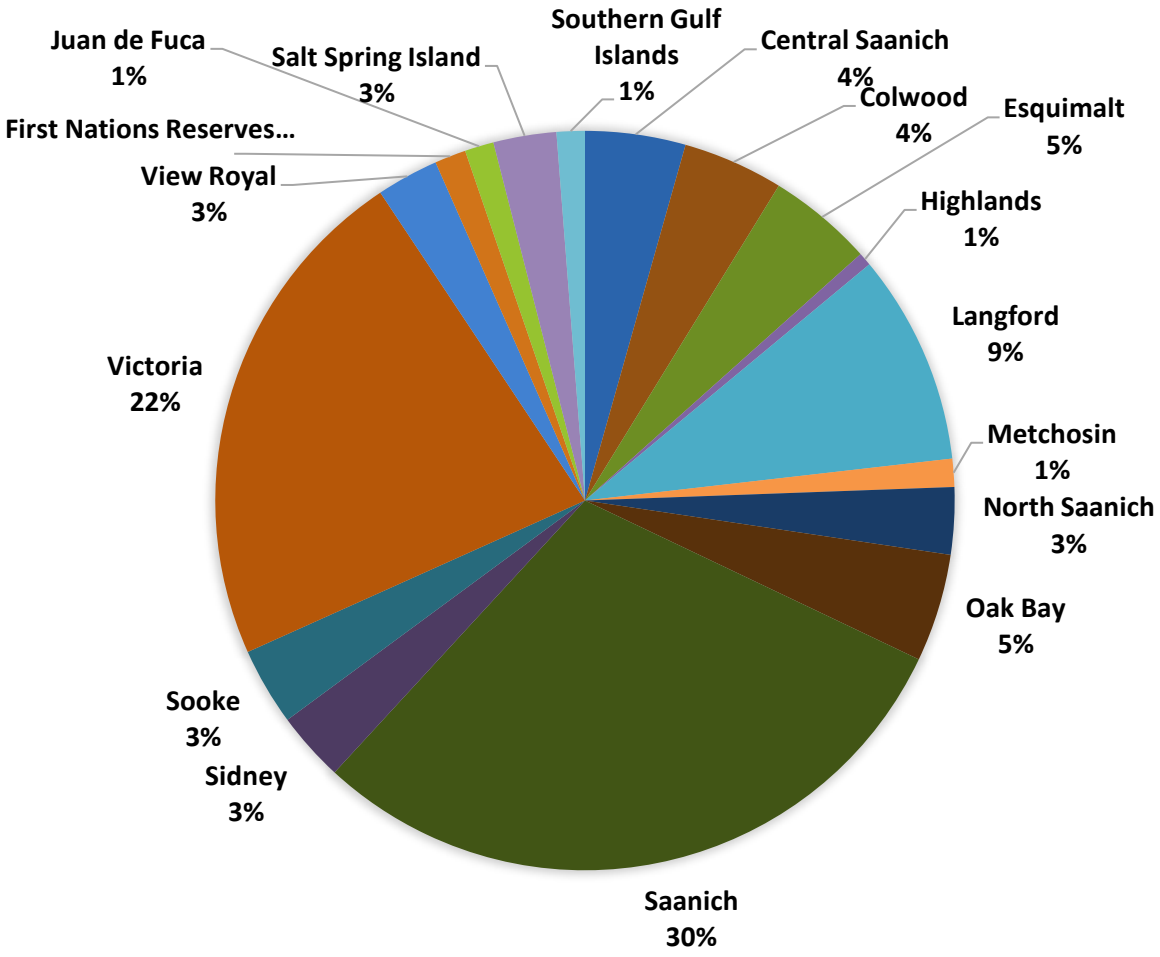

Figure 3-3: 2016 CRD Population by Administrative Area[3]

[1] Data source: CRD Regional Planning Services

[2] Source: http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationProjections.aspx

[3] Data source: BC Stats 2016 Census of Population and Housing
http://www.bcstats.gov.bc.ca/StatisticsBySubject/Census/2016Census/PopulationHousing/MunicipalitiesByRegionalDistrict.aspx

3.2 Economic Data

The CRD has a well-diversified economy. A large public sector comprised of the Provincial government offices, universities and colleges and military installations are the key drivers of this area's economy. The area also has a growing technology and health services sector, along with a vibrant tourism industry. Retirement living and residential expansion continue to shape the demographics of this community.

Based on 2016 statistics, the main employment sectors in the CRD are health care (13% of employment), public administration (12%), retail (11%), accommodation and food services (9%), and professional, scientific and technical services (8%).[4]

3.3 Housing

Table 3-1 provides a breakdown of the housing types in the CRD, based on 2016 Statistics Canada data and building permits for residential structures.[5]

Table 3-1: Housing in the CRD[6]

Housing in the CRD (2016 Canada Census)		
	#	%
Single Detached Houses	70,630	41.5%
Semi Detached Houses*	32,375	19.0%
Row Houses	10,380	6.1%
Apartments (all types)	54,775	32.2%
Mobile Homes	1,990	1.2%
Total	170,150	100.0%
* includes flats, duplexes		

[4] Source: 2016 Census Profile Statistics Canada

[5] Data provided by the CRD. Does not include housing on First Nation Reserves.

[6] CRD

4 Characterization of the Solid Waste Stream

This section of the report provides a high-level quantitative assessment of the CRD's solid waste and includes information on the composition of waste disposed in the CRD (what types products and materials are being thrown away), who are the contributors to the waste stream and by what amount, and how much waste is disposed on an annual basis.

4.1 Composition of Waste Disposed

In 2016, the CRD contracted Tetra Tech to undertake a composition study of the waste disposed at the Hartland landfill. The CRD has been undertaking these studies regularly since 1990 to gain a deeper understanding of the nature of the waste being disposed and to identify potential opportunities for waste diversion. All data presented in this section has been taken from Tetra Tech's report *2016 Solid Waste Stream Composition Study.*

Figure 4-1 shows the estimated composition, by weight, of the waste landfilled at Hartland in 2016. The largest component of the garbage arriving at Hartland landfill was compostable organics (21.1%), followed by wood and wood products (17.0%), paper (15.4%), and plastic (14.3%). Wood and wood products were primarily identified in the on-site transfer station bins and CR&D waste streams.

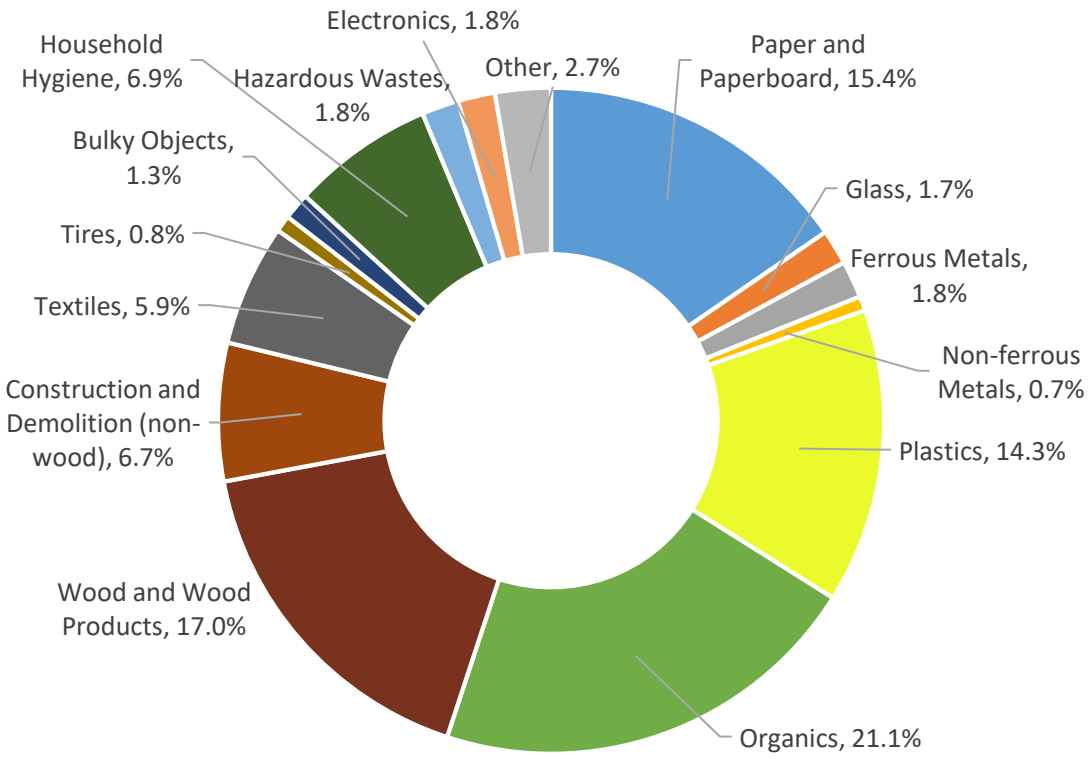

Figure 4-1: Estimated Composition of All Waste Landfilled at Hartland (By Weight), 2016

At time the waste composition data was compiled in the fall of 2016, it was estimated that 133,000 tonnes of waste would be disposed by the end of 2016. Based on the estimated weight of garbage, and the total estimated population of 378,232 the total waste generation rate is 348 kg/capita in the CRD. Using the waste composition data collected in this study and the waste disposal data, the total waste disposed per capita per year by material stream was calculated by Tetra Tech. This includes approximately 75 kg of organics per capita, followed by 61 kg of wood and wood products, 55 kg of paper and paperboard and 51 kg of plastics. Of the total 75 kg/capita of organics, 35.8 kg/capita was identified as avoidable food waste, 24.8 kg/capita was unavoidable and backyard compostable, 5.7 kg/capita was donatable, 4.6 kg/capita was yard and garden waste, and 3.2 kg/capita was unavoidable and non-backyard compostable.

Figures 4-2 to 4-4 show the estimated composition of landfilled waste from each of the main types of waste generators:

1. Residential Waste;
2. Industrial, Commercial and Institutional (ICI) Waste, which includes garbage generated by multi-family residential buildings;
3. Self-Haul Waste, and
4. Construction, Renovation and Demolition (CR&D) Waste.

It should be noted that the information in this section reflects the composition of the solid waste disposed at Hartland landfill only.

4.1.1 Residential Waste Composition

Figure 4-2 provides an estimate of the composition of the residential waste stream, representing garbage collected from homes on collection routes which have curbside service. The largest component of the garbage was compostable organics (28.2%), followed by household hygiene (15.9%), paper (14.8%), and plastic (14.8%). Compostable organics mainly comprised food waste (26.1%), of which 13.5% of food was avoidable and 9.7% was unavoidable and backyard compostable. A total of 1.7% of the food waste was identified as being donatable in its current form. The largest component of household hygiene waste was diapers (6.6%), followed by cat litter (4.5%) animal feces (2.9%) and other hygiene products (1.9%). The largest component of paper was other paper (primarily compostable paper such as napkins, paper plates, and food soiled paper) at 6.4% followed by paper packaging (2.8%) and printed paper (1.5%). The largest portion of plastic was plastic film packaging (3.5%), followed by durable plastic products (3.3%).

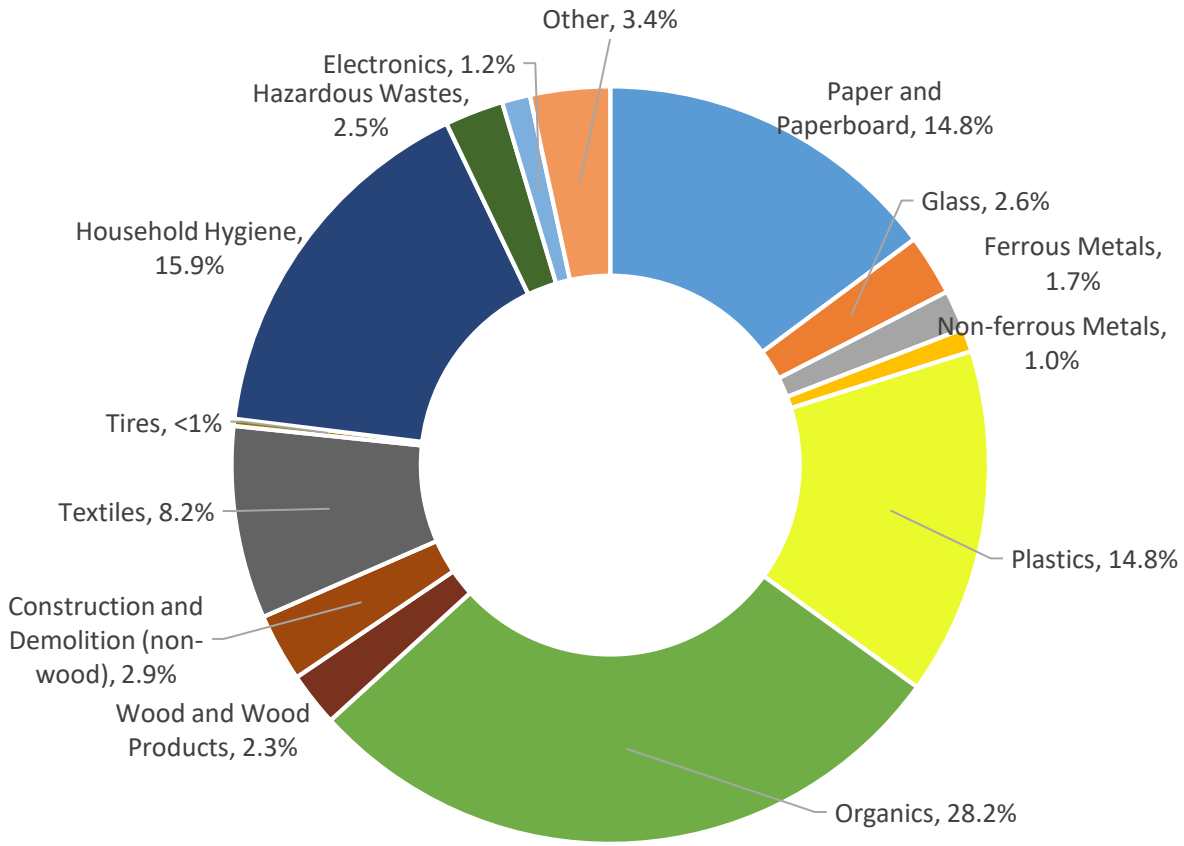

Figure 4-2: Estimated Composition of Curbside Residential Waste (By Weight), 2016

4.1.2 Multi-Family Waste Composition

A separate dataset was established for multi-family residential buildings (generally apartments and condominiums). Figure 4-3 provides an estimate of the composition of the garbage disposed of by the multi-family sector. The largest component of the garbage was compostable organics (31.1%), followed by paper (16.2%), plastic (15.5%), and household hygiene (11.5%). Compostable organics mainly comprised food waste (28.4%), of which 12.2% of food was avoidable and 11.3% was unavoidable and backyard compostable. A total of 2.9% of the food waste was identified as being donatable in its current form. The largest component of paper was other paper (primarily compostable paper such as napkins, paper plates, and food soiled paper) at 6.0%, followed by paper packaging (2.7%), other paper (2.0%) and 1.1 % of both corrugated cardboard and newsprint, and 1.0% paper packaging for liquids. The largest portion of plastic was durable plastic products (4.5%) followed by rigid plastic containers (2.5%) and film packaging (2%). The fourth largest portion of the garbage stream was household hygiene (11.5%) which consisted primarily of diapers (6.5%) followed by cat litter (2.3%), animal feces (1.5%) and other hygiene products (1.1%).

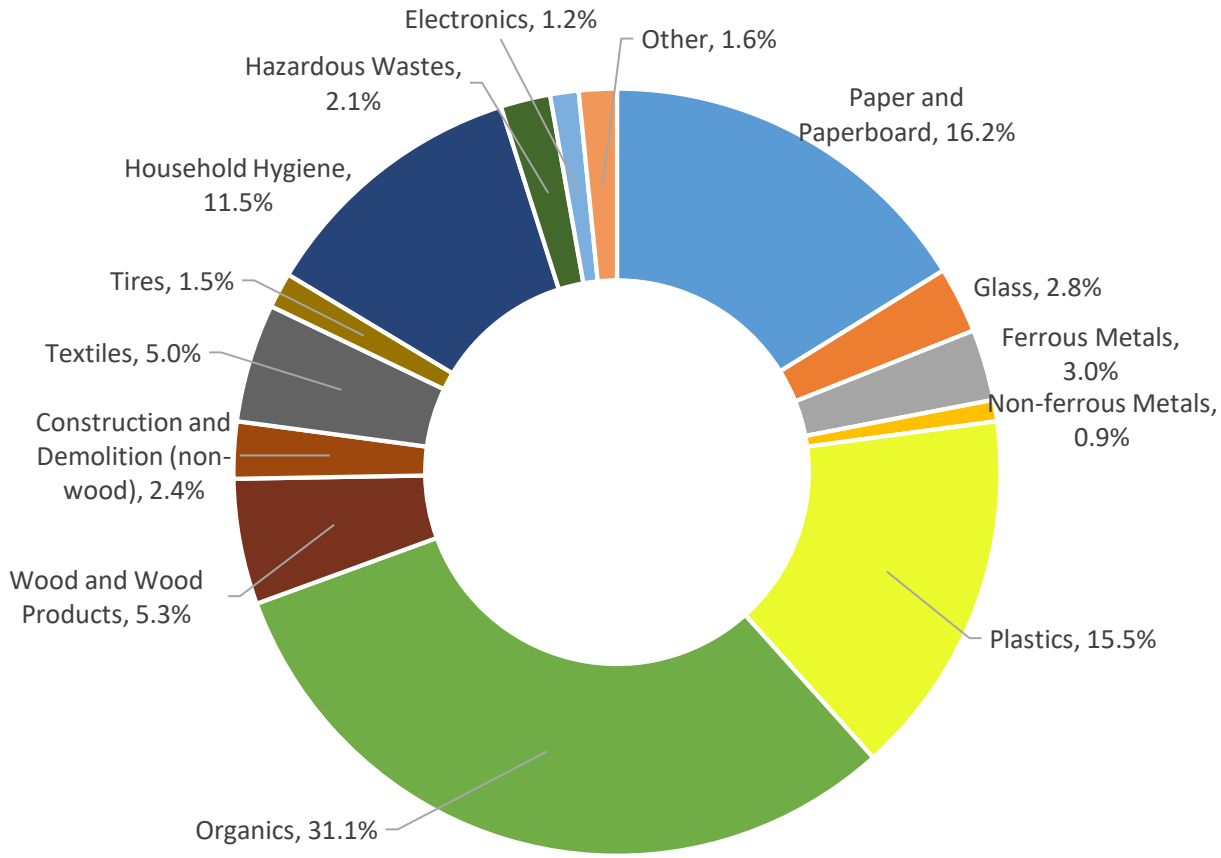

Figure 4-3: Estimated Composition of Multi-Family Residential Waste (By Weight), 2016

4.1.3 ICI Waste Composition

Figure 4-4 provides the estimated waste composition of waste generated by the IC&I sector. The largest component of the garbage was compostable organics (23.3%), followed by paper (22.9%), plastic (17.6%), wood (8.2%) and textiles (7.2%). Compostable organics mainly comprised food waste (22.0%), of which 12.2% of food was avoidable and 7.0% was unavoidable and backyard compostable. A total of 1.9% of the food waste was identified as being donatable in its current form. The second largest category was paper (22.9%) which included compostable soiled paper (8.3%), paper packaging (3.0%), printed paper (2.8%) and corrugated cardboard (2.8%), other paper (2.6%) and paper packaging for liquids (2.3%). Plastics (17.6%) included durable plastic products (5.3%), film packaging (2.9%), other film (2.4%), #2 and #4 film packaging (2.3%) along with other categories making up the remainder. Wood included treated wood (6.5%) followed by wood furniture (0.7%) and clean wood (0.6%).

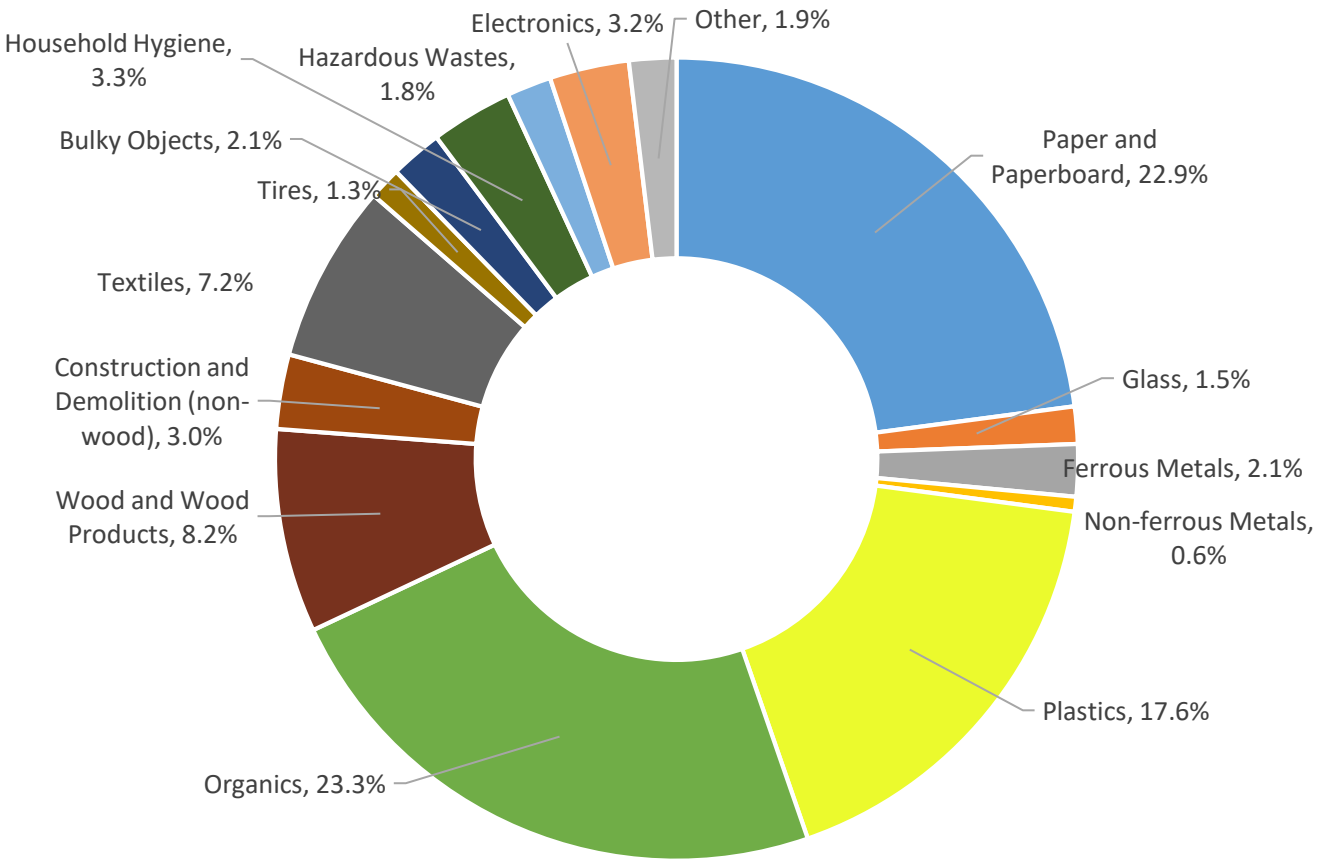

Figure 4-4: Estimated Composition of ICI Waste Landfilled at Hartland (By Weight), 2016

4.1.4 Self-Haul Waste Composition

Self-haul waste refers to any garbage that is delivered to the public drop-off area at Hartland. Self-haul waste originates from residential and some ICI sources. Figure 4-5 shows the estimated composition, by weight, of the garbage self-hauled to Hartland landfill.

The largest component of the garbage was wood and wood products (43.4%), followed by construction and demolition (13.3%), other (consisting predominantly of sealed opaque garbage-type bags which were not opened for inspection as part of the composition study 10.0%), plastic (9.4%) and organics (8.4%).

Wood and wood products consisted of treated wood (19.7%), wood furniture (7.6%), painted wood (5.8%), pallets/skids (4.4%), wood shingles (3.1%), plywood/particle board (2.5%) and clean wood (0.6%). Construction and demolition materials included carpet (5.5%), flooring (1.8%) and smaller amounts of shingles, roofing, drywall, insulation and other CR&D waste.

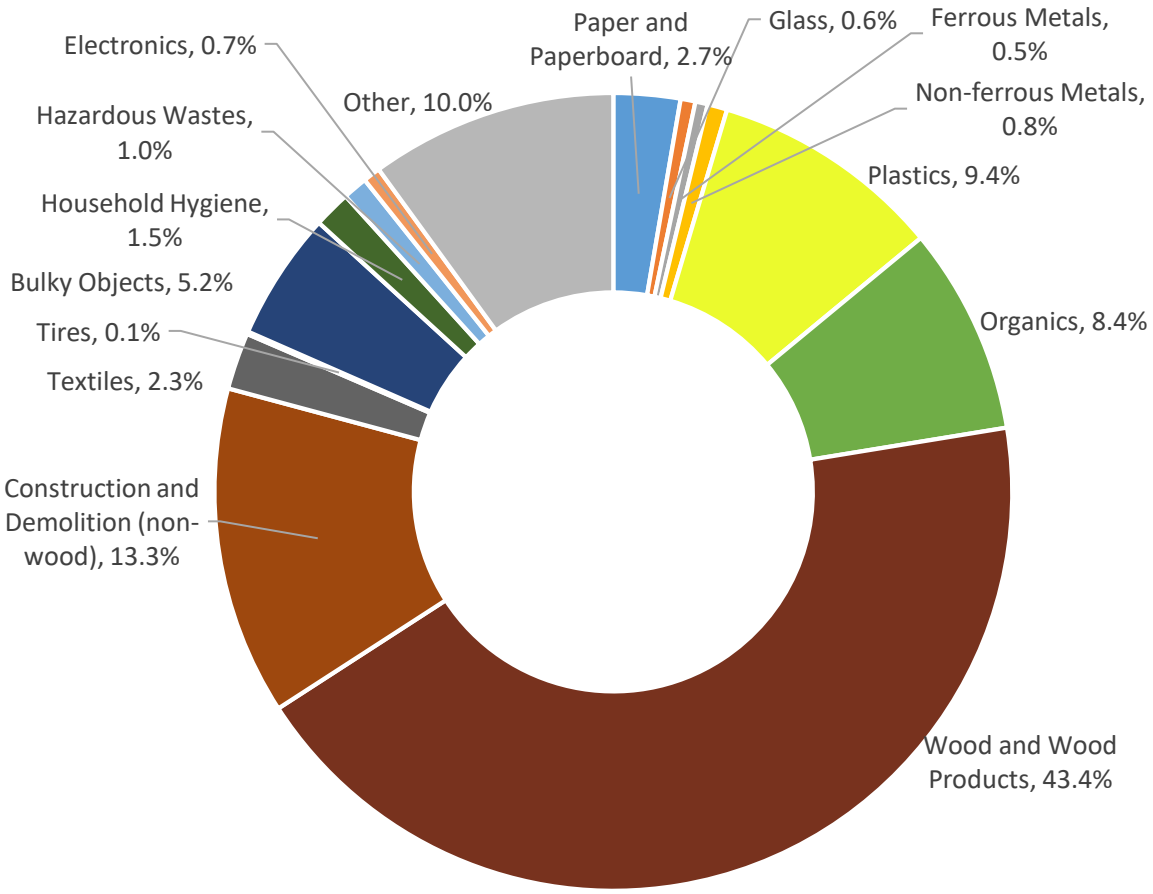

Figure 4-5: Estimated Composition of Self-Haul Waste Landfilled at Hartland (By Weight), 2016

4.1.5 Construction, Renovation & Demolition (CR&D) Waste Composition

Figure 4-6 shows the estimated composition, by weight, of the CR&D waste disposed at the Hartland landfill. The largest component of the CR&D garbage was wood and wood products (63.9%), followed by construction and demolition (23.6%), and plastic (5.5%).

Wood and wood products consisted of treated wood (28.5%), pallets/skids (10.9%), painted wood (8.2%), plywood/particle board (6.9%), wood shingles (6.3%), clean wood (2.9%), and wood furniture (0.2%). Construction and demolition materials included asphalt singles (14%), roofing felt (3.9%), insulation (3.6%) and small amounts of flooring, drywall and other CR&D waste.

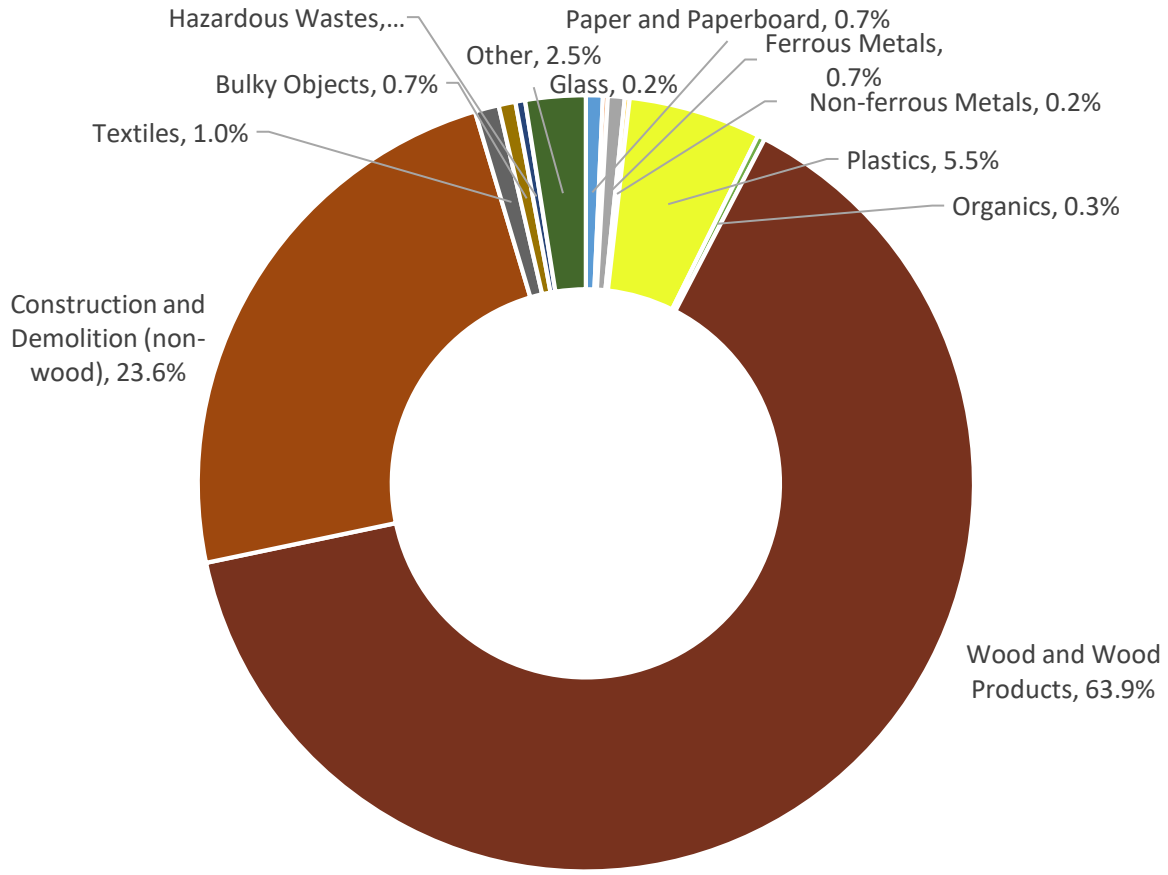

Figure 4-6: Estimated Composition of Construction, Renovation and Demolition Waste Landfilled at Hartland (By Weight), 2016

4.1.6 Change in Overall Waste Composition from 2001 to 2016

Table 4-1 shows the change in overall waste composition between 2001 and 2016 as recycling and organic waste diversion services have become more prevalent.

Table 4-1: Comparison in Waste Composition at Hartland Landfill

Primary Category	2001[7]	2004[7]	2009/2010[8]	2016
	Kg/Capita			
Paper and Paperboard	62	67	67	55
Glass	9	9	8	6
Ferrous Metals	13	12	10	6
Non-ferrous Metals	3	4	3	2
Plastics	54	59	54	51
Organics	119	128	120	75
Wood and Wood Products	37	41	53	61
Construction and Demolition (non-wood)	33	27	32	24
Textiles	15	20	23	21
Tires	3	2	3	3
Bulky Objects	6	4	3	4
Household Hygiene	30	29	38	25
Hazardous Wastes	1	5	3	6
Electronics	4	11	8	6
Other	8	12	8	10
Waste Generation (kg/capita)	399	429	433	357

[7] The categories from the 2001, 2004, and 2009/2010 waste composition study were reorganized and recalculated to allow for direct comparison with the 2016 results

[8] The 2009/2010 kg/capita was recalculated to include the tonnage of waste that arrived at the Tervita Highwest Landfill. No tonnage data is available for Tervita Highest Landfill in 2001 and 2004.

The Tetra Tech report identified the following trends based on the historical waste composition studies:

- From 2010 to 2016, the percentage of organics in the waste composition decreased by 6.6%. The change in the waste generation rate for organics shows a significant drop of 45 kg/capita from 120 kg/capita in 2010 to 75 kg/capita in 2016. The decrease is likely due to the implementation of organics diversion policies and programs in the CRD.
- The only material to have increased in waste generation compared to all other years since 2001 was wood and wood products, now representing 61 kg/capita. This is primarily wood from construction, renovation and demolition activities. All other primary materials have either stayed consistent or have decreased in the overall weight arriving at Hartland.
- From 2010 to 2016, the percentage of paper in the waste composition decreased by 0.1%, however the total change in the waste generation rate for paper shows a drop of 12 kg/capita from 67 kg/capita in 2010 to 55 kg/capita in 2016. This change is likely reflective of the lower overall consumption of paper in the marketplace and of increasing recycling activity.
- From 2010 to 2016, the percentage of plastic in the waste composition increased by 1.8%. However, the change in the waste generation rate for plastic shows a drop of 3 kg/capita from 54 kg/capita in 2010 to 51 kg/capita in 2016. This is likely due to increased recycling of plastic, but also of the light weighting of plastic packaging.
- The total amount of textiles has been relatively consistent since 2001, fluctuating between 15 and 23 kg/capita and a total of 21 kg/capita calculated in 2016.
- For all the other materials, the amounts were slightly lower than or relatively consistent compared to previous years.

4.2 Contributors to Waste Disposed

Figure 4-7 shows the relative contribution to solid waste disposed by sector for Hartland landfill in 2016, as calculated by Tetra Tech as part of the 2016 waste composition study. The Highwest Waste Management Facility intermittently accepted waste in 2015 and 2016 and did not accept any waste between August 2016 and January 2017, so the data used to generate this chart represents all waste landfilled in the CRD in 2016.

As shown, the largest contributor to the waste disposed is the ICI sector (41%), with curbside residential waste representing the next largest contributor (25% of waste disposed). The tonnes of waste contributed by the CR&D sector tend to vary significantly from year to year, depending on the local economy and the number and type of major construction projects in the area.

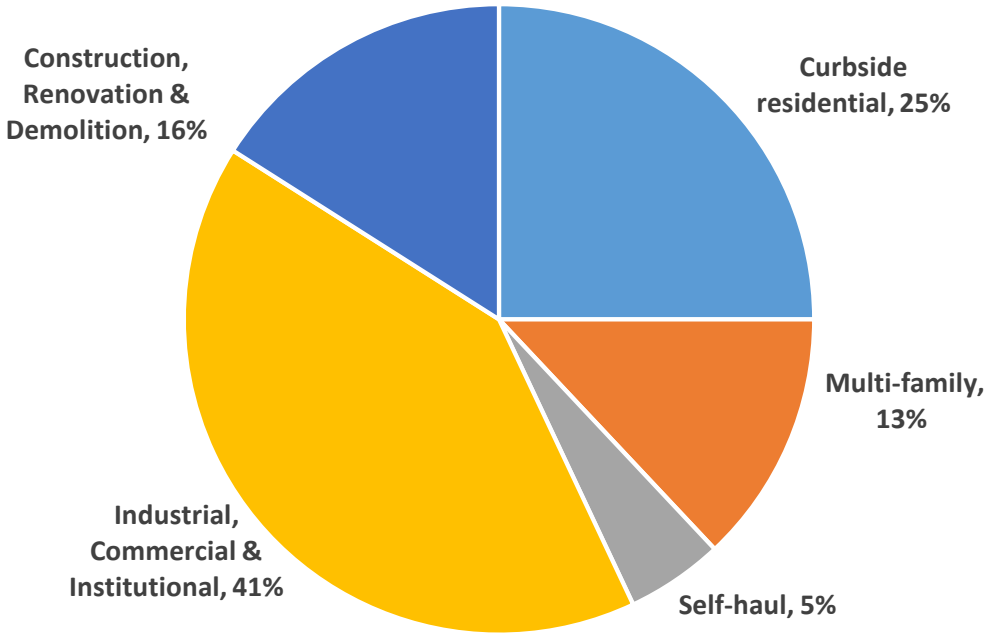

Figure 4-7: Sectors Contributing to Waste Disposed

Please note that the above data refers to disposal only and does not include tonnes diverted to recycling and composting.

4.3 Disposal and Diversion

The amount of waste landfilled is typically a reflection of two primary drivers: the range of diversion opportunities available for residents and businesses, and the level of economic activity. For many years, BC regional districts attempted to measure the amount of solid waste disposed *and* diverted within their boundaries and reported this information to the Provincial Ministry of Environment. Over time, it became clear that most regional districts had good data on disposal, but because much of the recycling and composting activity in the province is undertaken by the private sector, that data on diversion was less reliable. Many regional districts developed their own individualized calculations over time which resulted in inconsistent data.

Consequently, beginning in 2012, the Province asked that each regional district only report on the total tonnes of municipal solid waste disposed and use the per capita disposal rate as the new metric. They created the BC Waste Disposal Calculator to ensure the same methodology for measuring disposal was used by all regional districts.

4.3.1 Disposal

The CRD has always used per capita disposal tonnages at Hartland landfill to measure progress towards waste reduction targets. The Ministry's disposal calculator changed the CRD's historical calculation in three ways:

- The Ministry asked the CRD to include tonnages from the Highwest Waste Management Facility in their disposal rate calculation as the facility became part of the CRD's SWMP in 2008. This resulted in an increase in the CRD's per capita disposal rate.
- The Ministry's calculator uses BC Statistics for population numbers whereas the CRD had previously used CRD Regional Planning Services population data. The CRD's data were more up-to-date than the BC statistics and reflected more recent population growth. This change resulted in an additional increase to the historical CRD per capita disposal number.
- In 2014, the Ministry introduced new Beneficial Use Guidelines which allow certain solid waste materials that are used in landfill construction and operations to be excluded from being counted as disposal. This resulted in a decrease of the per capita disposal rate.

As a result of the above changes, the per capita disposal data from the 2012 Existing System Report differs from the current information. Table 4-2 shows per capita disposal numbers from 2012 to 2016, using the revised approach based on the Province's disposal calculator.

Table 4-2: CRD Disposal (2012-2016)

		Hartland Landfill				
Year	Population[9]	Received	Beneficial Use	Landfilled	Tervita Highwest Landfill [10]	Disposal Rate (kg/person)
2012	368,935	129,279	n/a	129,279	7,880	372
2013	371,265	123,210	n/a	123,210	13,025	367
2014	372,463	120,942	-1,636	119,306	18,000	369
2015	377,810	114,476	-2,034	112,442	18,000	345
2016	382,645	134,167	-971	133,196	0	348

[9] BC Stats

[10] 80% of facility's total disposal in recognition of out-of-region waste being landfilled at site

The Highwest Waste Management Facility (described in Section 11.4) is licensed to receive 22,500 tonnes of non-putrescible waste per year. Approximately 80% of this waste (18,000 tonnes) is generated inside the CRD and is included in Figure 4-8. Waste generated outside the CRD boundaries is not included in the CRD's disposal calculations. Note that for much of 2016, the Highwest facility was closed for most of the year and received very little waste during that year. In 2017, the site re-opened for business.

Figure 4-8 shows the tonnes of waste disposed at the Hartland landfill from 1989 to 2011, and for the Hartland landfill *plus* the tonnes landfills privately owned Highwest facility from 2012 to 2016. The addition of the Highwest's tonnes provides a complete picture of the tonnes of solid waste disposed in the CRD.

Figure 4-8 shows a significant reduction in the amount of waste sent to landfill during the 1990s due to increasing recycling activities, but that this trend stopped from 2000 to 2007 when there was a significant economic upswing. The downward trend resumed in 2008, after the economic slowdown. Tonnages at Hartland landfill decreased steadily, especially in 2015, with the introduction of the kitchen scraps ban. However, this has been off-set by the new calculation method and increased economic activity in 2016 and 2017. Overall, since 1989, the CRD reduced the per capita disposal rate from 671 kg per capita per year down to 348 kg per capita in 2016; a reduction of 48%. 2017 per capita disposal data are not yet available but are expected to be higher as more garbage was received at Hartland landfill.

The BC Ministry of Environment has a provincial goal of reducing BC's per capita disposal to 350 kg by 2020. The CRD's per capita disposal rate surpassed this goal in 2015 and 2016. The challenge will be to maintain the CRD's low disposal rate, as the region is experiencing economic growth which has resulted in increased tonnages at the landfill.

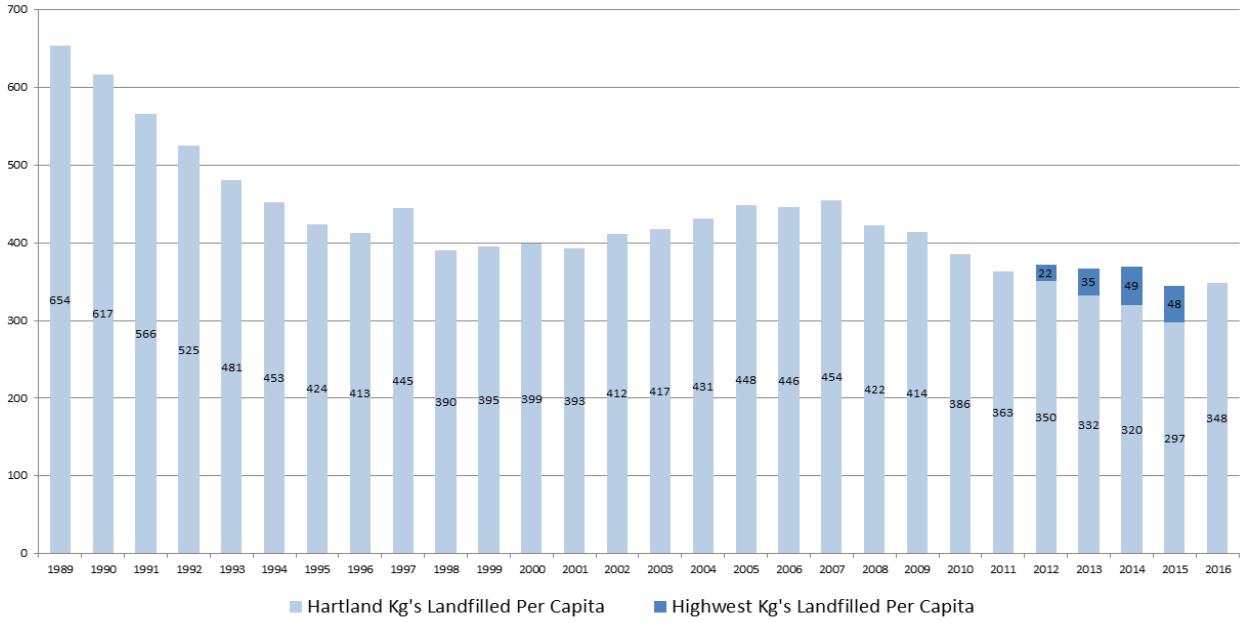

Figure 4-8: CRD Per Capita Disposal Rate (kg), 1989-2016

4.3.2 Diversion of Waste

As noted above, measuring diversion is particularly challenging and consequently, disposal rates are used instead as an indicator of the success of diversion initiatives such as recycling and composting programs.

Using the waste composition data prepared by Tetra Tech in 2016, it is possible to estimate how much of what is currently landfilled could be diverted from disposal and managed in a manner higher up the waste management hierarchy. Table 4-3 shows, for each waste generator type, the estimated diversion potential of what is currently landfilled at the Hartland landfill, including what percentage is potentially recyclable (based on currently available markets), compostable, or could be managed through an extended producer responsibility (EPR) program. These estimates are based on the waste composition data for each of the materials found in the landfilled waste that could be diverted, as listed in Table 4-4.

Table 4-3: Estimated Diversion Potential of Landfilled Waste

Potentially Divertible Landfilled Waste	Single Family	Multi-Family	ICI	On-Site Bins	CR&D	Average
Recyclable (including residential PPP)	10.40%	12.20%	14.90%	2.70%	1.40%	10.70%
Compostable	35.60%	38.40%	32.40%	7.00%	0.20%	27.50%
EPR products (including deposit-bearing beverage containers)	3.30%	3.80%	5.10%	1.60%	0.40%	3.90%

Table 4-4: Divertable Components of Landfilled Waste

Recyclable (including residential PPP)	Compostable	EPR products (including deposit-bearing beverage containers)
Newsprint Printed Paper Corrugated Cardboard Paper packaging – dry goods Paper packaging – liquids Glass containers – bottles and jars (non-deposit) Ferrous Food containers Other ferrous metals Non-Ferrous Food containers & foil Other non-ferrous metals Plastic containers – bottles & jugs – non-deposit	Soiled paper (compostable) Food waste – backyard compostable (unavoidable) Food waste – non-backyard compostable (unavoidable) Food waste – avoidable Food waste – donatable Food waste – fats, oil and grease Yard & garden waste	Paper Beverage Containers – deposit Glass beverage containers – deposit Ferrous metal beverage containers – deposit Non-ferrous metal beverage containers – deposit Plastic beverage containers – deposit Vehicle tires Light bulbs, tubes & ballasts Batteries – automotive Batteries – household Oil and antifreeze EPR paints & containers (latex and oil) EPR solvents & pesticides Light bulbs, tubes & ballasts TV & audio/video equipment Computers & peripherals Telephones & answering machines Cell phones Electronic/electrical instruments (incl. toys) Alarms & Thermostats Heating & cooling products Small appliances & power tools Outdoor power equipment

Challenges/Opportunities

Since the 2012 Existing System Report, the economy has changed which has resulted in increased tonnages at Hartland landfill. This has increased revenues, but also the per capita disposal rate. If this trend continues, it may be a challenge for the CRD to sustain its low disposal rate and meet the province's target of 350 kg/capita by 2020. On the other hand, the amounts of potentially divertable landfilled waste present an opportunity for reducing tonnages.

4.3.3 Import and Export of Waste

In addition to the waste disposed at the Hartland landfill and the Highwest Waste Management Facility, there is some export of waste to private landfills outside of the CRD. Hartland landfill does not officially accept imported waste from out of region. However, undeclared waste is believed to be imported into the CRD from private haulers that provide service elsewhere on Vancouver Island, although the specific quantity of export and import of waste is not known.

To date, the Ministry has not granted permission to regional districts to control the flow of waste by requiring that solid waste generated be disposed of in region. This means that waste haulers are free to dispose the refuse they collect wherever it is most financially advantageous to do so. There are a number of privately-owned landfills in the Lower Mainland, Fraser Valley and Washington State with competitive fees to which solid waste from this region can be exported. Many of these facilities also offer the competitive advantage of accepting all material types, including drywall and recyclable materials, for disposal. This allows haulers to avoid the significant costs of separating and recycling these materials.

5 Existing Waste Management System

Solid waste facilities in the CRD include recycling depots, return centres for EPR products, transfer stations, recycling processing facilities, reuse organizations, food banks, yard and garden waste composting facilities and landfill sites. These facilities are supported by a range of collection services, education programs, and government policies and bylaws. These services are undertaken by public, private and non-profit organizations.

The CRD bases their approach to solid waste management on the hierarchy presented in Figure 1-1 on page 2, such that reduction, reuse, recycling, resource recovery and residual management are all integrated into the existing system.

The breadth of the solid waste activities in the CRD is reflective of a complex and mature solid waste management system. Sections 6 through 16 of this report provide a description of each of the components that make up the existing solid waste management system. The presentation of the components generally follows the waste management hierarchy, starting with initiatives that minimize the amount of waste that needs to be managed (through reduction and reuse), and finishing with residual waste management (landfilling). At the end of each section, challenges and opportunities specific to the activities are identified.

6 Reduction and Reuse Activities

The key reduction and reuse activities in the CRD include:

- The CRD encourages backyard composting through providing financial support to the Victoria Compost Education Centre (see more about VCEC in Section 9.2). Backyard composting is one of the most effective methods of reducing the amount of waste that enters the solid waste management system.
- There is a reuse area located at Hartland landfill where facility users can place reusable goods. The CRD partners with non-profit organizations for the management of those reusable items,

(these include textiles, books, household items and bicycles), which are redistributed through a variety of networks operated by these associations.

- There are reuse areas/free stores located at the recycling depots on the Southern Gulf Islands.
- There are several private and non-profit organizations that have locations for the drop-off and purchase of used goods.
- The CRD supports not-for-profit organizations involved in the reuse of goods by allowing non-saleable goods to be disposed at Hartland landfill at a reduced tipping fee.
- There are several on-line classified services, such as Craigslist, Kijiji, Varage and UsedVictoria.com, for the sale and purchase of used goods, as well as Freecycle.org which requires no monetary transaction to acquire or dispose of used items.
- As in many larger centres there is a growing acceptance of the "sharing economy" and for locally based solutions, for example community organizations hosting Repair Cafes, and the creation of the Victoria Tool Library.
- Several retailers have limited the provision of free-of-charge single-use shopping bags for customers as a means of encouraging the use of reusable bags. In January 2018, the City of Victoria approved the adoption of the Checkout Bag Regulation Bylaw. The bylaw is proposed to take effect July 1, 2018, with enforcement starting January 2019.

Additionally, the CRD undertakes a wide range of education activities where reduction and reuse are part of the curriculum. These activities are described in Section 16.

Challenges/Opportunities

As already identified in 2012, one of the biggest barriers to reducing and reusing are the high material consumption levels in our society. The opportunity to encourage behaviours to move up the waste reduction hierarchy and sustainable product design are encapsulated in the idea of creating a "circular economy", which also forms part of the first guiding principle for solid waste planning.

7 Recycling

This section deals with the next step in the 5R pollution prevention hierarchy: recycling.

7.1 Residential (single family) Collection

The CRD has provided residential curbside recycling in the Capital Region since 1989. The program now serves all single family dwellings, with the exception of some homes in the electoral areas. In 2011, the Province amended the Recycling Regulation to make producers of residential packaging and printed paper (PPP) responsible for collecting and recycling their products. In 2013, a newly formed not-for-profit organization Multi-Material BC (MMBC) received approval for a stewardship plan for the collection and recycling of residential PPP in B.C. The CRD, along with many other existing local government recycling collectors in the Province, entered into an agreement with MMBC (since rebranded as Recycle BC) to continue contracting the collection of PPP on their behalf. This new model for residential recycling collection began in May 2014.

Under the agreement with Recycle BC, the CRD provides 123,457 households (2016 count) with curbside recycling service for packaging and printed paper. The CRD Blue Box Program successfully transitioned to a three-stream recycling model with glass containers collected separately from the other materials.

All of the First Nations reserves within the CRD boundary participate in the CRD's curbside recycling service with the exception of the Pacheedaht on the Gordon River reserve which have a service agreement with the CRD to use the CRD recycling depot and transfer station in Port Renfrew.

7.2 Multi-family Collection

Prior to May 2014, and the launch of the new provincial PPP recycling program (Recycle BC), the CRD had developed a funding program in 2000 that provided funding to apartment owners and managers to help off-set the costs of private collection services for recyclables. Of the approximately 45,000 multi-family residential units in the CRD, an estimated 90% (42,000) took advantage of this funding.

Under the BC Recycling Regulation, producers of PPP are also responsible for multi-family residences so the CRD program ceased in May 2014. Similar to contracting local governments to continue collecting single family PPP materials at the curb on its behalf, Recycle BC is able to enter into agreements with private haulers and local governments to collect PPP materials from multi-family residential customers. Recycle BC reports that fewer than 2,000 multi-family households in the CRD are serviced by private contractors who have signed on to their program. The majority of multi-family buildings continue to receive recycling collection from waste haulers who have not contracted to Recycle BC.

7.3 Recycling in the Electoral Areas

Residents of Salt Spring Island and the Southern Gulf Islands are provided recycling services through recycling depots in their communities. Depots are located at:

- Salt Spring Island
- Galiano Island
- Mayne Island
- Pender Island
- Saturna Island

In addition to PPP recycling, these depots which are operated by community not-for-profit associations, offer recycling services for additional items and in some cases also offer other services such as a free store. Recycle BC's financial incentives for collection of PPP materials are insufficient to cover the cost of PPP collection at these depots, resulting in significant financial shortfalls for the depot operators. To date, the CRD has been covering the funding shortfall; however, continuation of this is an issue for consideration.

Figure 7-1: Mayne Island Recycling Depot

Figure 7-2: Pender Island Recycling Depot

In the Juan de Fuca Electoral Area, many residents are serviced by the curbside program. Port Renfrew residents are serviced through the CRD recycling depot and transfer station. Recycle BC provides funding for the collection of PPP at this depot and the CRD provides additional recycling bins for metal and other recyclables.

7.4 Collection from the Industrial, Commercial and Institutional Sector

The provincial PPP recycling program (Recycle BC) applies to PPP generated by the residential sector only. Consequently, private sector collection companies collect recyclable materials from the ICI sector. The CRD recyclable materials bans include all EPR materials and apply equally to the ICI sector as they do to the residential sectors. While collection of recyclables is not mandatory, the CRD's disposal bans provide the incentive for the ICI sector to have these materials collected because loads of garbage containing banned materials are subject to fines at the landfill.

7.5 Recycling Depots

In addition to collection services, there are public (CRD and municipal) and privately-operated depots located throughout the region accepting recyclables of many types, kitchen scraps, yard waste, and household hazardous waste. Some of these depots also receive garbage.

7.5.1 Recycling at Hartland Landfill

The public drop-off area at the Hartland landfill accepts a broad range of recyclables, yard waste, household hazardous waste and EPR materials. Over 80 items from 28 product categories are accepted for recycling. This area is intended for residential quantities only, for vehicles with a maximum GVW of 5,500 kg.

Table 7-1: Items Collected for Recycling and EPR at Hartland Landfill

Antifreeze	Appliances – Cooling
Appliances – Large	Appliances – Small (countertop, hairdryers, vacuums, etc.)
Batteries (household, rechargeable & automotive)	Beverage Containers (refundable)
Bicycles	Books (hard and soft cover)
Cardboard and Pizza Boxes	Cartons (milk, soup)
Cell Phones	Clothing (clean, dry and bagged or boxed)
Cooking Oil	Electronics – TVs, computers
Fire Extinguishers	Fluorescent Tubes and Light Bulbs
Glass Bottles and Jars	Household Hazardous Waste (accepted from residents only)
Lighting Equipment	Mattresses
Metals - ferrous (wrought iron, casting, steel)	Metal Containers (tins, aluminum foil, empty aerosol cans)
Motor Oil (filters and empty oil containers)	Metals – nonferrous (lead, copper brass, aluminum, windows, sliding doors)
Paper Products	Paints and Solvents (for recycling or paint exchange)
Plastic (containers and packaging)	Plastic (clean bags and film)
Propane Tanks	Pesticides
Thermostats	Smoke and Carbon Monoxide Alarms
Tires and Tubes (bicycle)	Styrofoam (blocks and trays)
Salvageable Goods[11]	Tires (automotive)

[11] Accepts some reusable items that are in working order. These goods are made available to non-profit or charitable organizations for reuse or resale

Residents are charged $6 per vehicle to drop off recyclables. There is no charge to drop off household hazardous waste and EPR items. Small commercial haulers (GVW less than 5,500 kg) that have been hired by a third party can also use the recycling area but are required to pay a $26 surcharge.

In 2016, 3,110 tonnes of recyclable materials (excluding organics) were collected in the public drop-off area at Hartland landfill.

7.5.2 Private Recycling Depots

In addition to the recycling collection programs and drop off facilities provided by the CRD and municipalities, many private recycling depots operate in the region. These facilities serve both commercial and residential customers.

Many depots operate as collection sites for EPR programs. For example, there are two private depots (Saanich and Victoria Bottle Depots) that have agreements with Recycle BC to accept residential PPP materials; receiving over 600 tonnes of PPP in 2016.

7.6 Processing and Marketing of Recyclables

The recyclables collected through the CRD curbside program and at Hartland landfill are processed and marketed through contracts with private recycling companies. There is no public-sector processing and marketing of recyclables in the CRD, regardless of whether these are collected under the banner of an EPR program or a non-EPR program.

The marketing and processing of recyclables is a business that is not limited by jurisdictional boundaries. In its 2016 annual report, Recycle BC reported that 20,421 tonnes of residential PPP were collected from all sources in the CRD. This amount, along with everything else it collected under its program in the province was sold into the following markets:

- Plastics – Sold to end-markets in BC.
- Paper & Fibres (including aseptic/polycoat containers) – The majority sold to end-markets in China, with the rest either remaining in BC of going to end-markets in the United States and South Korea.
- Glass – Sold to end-markets in BC.
- Metals – Largely sold to end-markets in Ontario, with the rest either remaining in BC or going to end markets in the United States.

Domestic and international marketplace changes for recycling is an issue gaining importance with the “National Sword” policy recently implemented by China. This new policy severely restricts the importation of recyclable materials from sources outside of China by significantly lowering the allowable levels of contamination. Residential PPP collected for and by Recycle BC has not been greatly impacted to date, however other collectors, including private collection companies, may be challenged finding markets for all the recyclables they currently collect. This may result in reducing the level of recycling happening in the CRD until alternative markets are established.

Challenges/Opportunities

A number of challenges within the recycling system in the CRD have been identified in the preceding sub-sections which may form part of further discussions. In brief, these issues include:

- Recyclable materials being disposed in the landfill;
- Securing on-going funding for Southern Gulf Islands recycling depots;
- The emergence of the Chinese National Sword policy and its potential to curtail export of recyclable materials;
- The lack of Recycle BC engagement with those who provide recycling collection services to the multi-family sector; and
- The PPP recycling program applies only to the residential sector, meaning there is not an EPR program in place for PPP generated by the IC&I sector.

Some of these challenges could also represent opportunities. More recyclables can be diverted from the waste stream and the National Sword policy may provide the incentive to build local processing infrastructure and domestic (North American) markets.

Figure 7-3: Baled Juice Cartons from the Recycle BC Program at Merlin Plastics, Vancouver

8 Extended Producer Responsibility

EPR is a provincial policy tool that aims to shift the responsibility for end-of-life management of products (physically and economically) to the producer and away from local governments. This policy is intended to create an incentive for producers to include environmental considerations in design of products.

EPR programs in BC are mandated by Recycling Regulation 449/2004, under the EMA. The regulation requires producers of designated products to develop a program for their end-of-life collection and recovery, and to consult stakeholders (including local governments) when developing their plans.

The range of products managed through EPR programs has expanded significantly in the last decade.

Table 8-1 provides a list of the products currently covered by British Columbia's Recycling Regulation and the resultant programs.

Table 8-1: Regulated Products and EPR Programs in British Columbia

Product Category	Program(s)
Antifreeze, Used Lubricating Oil, Filters and Containers	• BC Used Oil Management Association
Beverage Containers	• Encorp (non-alcoholic and wine, spirits, coolers and import beer in non-refillable containers) • Brewers Distributed Limited (fillable and canned beer)
Electronics and Electrical Products	• Call2Recycle/Recycle My Cell (household batteries and cell phones) • Electronics Products Recycling Association (EPRA) (electronic, including: computers, televisions, audio-visual, medical equipment, office equipment, toys) • LightRecycle (lamps and lighting equipment) • Major Appliance Recycling Roundtable (MARR) (large appliances) • Outdoor Power Equipment Institute (OPEI) (outdoor power equipment) • Canadian Electric Stewardship Association (CESA) (small appliances, power tools, sports and exercise equipment, hobby, craft) • AlarmRecycle (smoke and carbon monoxide alarms) • Thermostat Recovery Program (TRP) (thermostats)
Lead Acid Batteries	• Canadian Battery Association & Interstate Battery System
Packaging and Printed Paper (residential only)	• Multi-Material BC (Recycle BC)
Paint and Solvents and Flammable Liquids, Gasoline and Pesticides	• Product Care (ReGeneration)
Pharmaceuticals	• Health Product Stewardship Association
Tires	• Tire Stewardship BC

The collection infrastructure for mandatory product stewardship programs may consist of return-to-retail and/or stand-alone depot systems. Stewardship agencies, set up by industry to manage the collection system, may directly operate their collection and/or recycling/disposal systems themselves or under contract to service providers including local government. For example, the CRD participates as a collector of EPR products at the Hartland landfill through the collection of paint, solvents, fuels, pesticides, batteries, tires, electronics and small appliances, and the Municipality of Oak Bay participates by collecting paint from Oak Bay residents at their municipal depot.

For residential packaging and printed paper (PPP), the stewardship agency Recycle BC provides recycling services either directly to communities or by working in partnership with local governments, First Nations, private companies, and other non-profit organizations. Within the CRD, over 125,000 single and multi-family homes receive collection services for PPP materials, and 10 depots accept residential PPP under contract to Recycle BC.

In accordance with the BC Recycling Regulation, the costs of collection and management of Product Stewardship programs are to be borne by producers and consumers, not by local governments or taxpayers.

Most stewardship programs charge separate fees at the point of purchase to cover the costs of managing the discarded product, and the fee is shown on the sales receipt as an “eco-fee”. These fees are applied by producers / brand-owners as part of the price of the product; they are not government-applied taxes. The Stewardship Agencies are responsible for educating consumers regarding their programs and for providing information about collection options, fees, and handling practices. Most agencies maintain websites, and / or utilize the services of the Recycling Council of British Columbia to provide web and phone based information on available collection services.

The range and variety of collection systems, programs and locations pose a challenge to local governments, consumers, stewards and producers alike. Residents keen to recycle responsibly may be satisfied having PPP items accepted at the curb yet can become frustrated when required to visit one or more locations to ensure other household items get deposited into the correct recycling program. Over time, and with the evolution of EPR in BC, it is expected that EPR programs and the stewards will start to create more efficient collection systems such as eco-depots (in effect a “one stop shop”) accepting multiple stewarded items regardless of the stewardship agency.

Challenges/Opportunities

Issues and challenges identified in 2012 included the lack of awareness and confusion about EPR programs, which remains relevant today. Uncertainty about the impact of Packaging and Printed Paper recycling however, has been quieted with the performance of Recycle BC, while the current work of the Province regarding EPR programs is to focus on the improvement of existing programs rather than seeking to implement new stewardship programs. There are opportunities for joint education efforts by stewards and local governments.

At the local level, community involvement with, and resistance to siting of, waste management facilities such as recycling centres can be a challenge. The CRD is just one player in terms of regulating waste management. Municipalities and the Province also are involved which can result in confusion and frustration from overlapping jurisdictions and contradictory regulations. Some local jurisdictions responsible for land use planning are being proactive in developing waste management zones, for example, on Salt Spring Island and North Pender Island.

9 Composting & Organics Recycling

9.1 Policies

The CRD has been using landfill bans as an effective diversion policy tool to divert organics from Hartland landfill. In 2006, a yard and garden material landfill restriction came into effect. The disposal ban was implemented once diversion options were well established. Invasive, infectious and noxious plants are not included in the restriction.

The landfill disposal ban on kitchen scraps came into effect in January 2015. The ban contributes to saving a valuable resource, conserving landfill space and reducing greenhouse gas emissions.

9.2 Backyard Composting

Many residents manage yard and garden waste and some of their kitchen scraps in backyard compost bins and digesters. The Victoria Compost and Conservation Education Society is a non-profit organization that provides composting and organic gardening education to CRD residents and businesses through a demonstration site, staff, volunteers, outreach, and workshops for children and adults. The Centre receives funding from the CRD as part of a service agreement.

9.3 Yard Waste Collection Services

There is limited municipal curbside collection of yard waste in the Capital Region. Five municipalities provide curbside collection ranging from an annual pick-up for leaves and tree branches in Victoria, Oak Bay and View Royal, to monthly collection in Sidney, and bi-weekly curbside collection in Saanich which accepts commingled yard waste and kitchen scraps. Some municipalities provide yard waste drop off depots. Residents and commercial haulers (max. of 5,500 kg GVW) can drop off yard waste at Hartland landfill.

There are private companies offering subscription-based yard waste collection services to customers throughout the CRD (available for residential and commercial customers). Additionally, there are several private yard waste drop off locations within the CRD.

9.4 Kitchen Scraps Collection

Six of the region's municipalities provide residential kitchen scraps collection from single family homes, either by way of municipal collection staff or through a contracted service. Private subscription services for collection and various private depot drop-off locations are available to residents in the remaining seven municipalities and three electoral areas. Port Renfrew residents have established a local solid waste service and have access to a transfer station to drop off kitchen scraps.

Multi-family buildings and the ICI sector are serviced by private collection service providers.

The Hartland transfer station received almost 8,000 tonnes of kitchen scraps in 2016 from municipal and commercial collection services.

9.5 Composting Facilities

In 2005, the Province approved the CRD's Bylaw to Regulate the Operation of Composting Facilities. The purpose of the Composting Bylaw is to ensure that composting operations do not contaminate ground or surface water, or generate unacceptable levels of nuisance odour, vectors, litter or dust, and to protect the public from composting operations which violate the requirements of the bylaw. The bylaw supplements existing provincial regulations under the Organic Matter Recycling Regulation (OMRR), by specifying that restricted organic matter requires in-vessel composting; requiring leachate, nuisance odour, vector, litter and dust management plans, and establishing a regulatory system for enforcing the requirements. The bylaw also deals with issues related to inspection, enforcement, storage and abandonment of materials.

The bylaw sets out four classes of licenses, as follows:

- Class 1 – composting general organic matter on an impermeable surface or in-vessel (this type of facility is exempt from licensing unless the facility generates leachate or creates nuisance odours, vectors, litter or dust)
- Class 2 – composting biosolids with general organic matter on an impermeable surface or in-vessel
- Class 3 – composting restricted organic matter
- Provisional – operations not using proven technology to compost restricted organic matter

The processing of yard waste generated within the CRD is handled by the public and private sector. Facilities processing yard waste do not require a license.

There is currently no licensed composting facility in the CRD processing kitchen scraps. Kitchen scraps processing is handled outside the CRD at privately owned and operated composting facilities in the Cowichan Valley or on the Lower Mainland. In January 2018, the CRD Board directed staff to pursue an in-region, or near region, organics processing facility by initiating a new procurement process.

The CRD contracts out the processing of the kitchen scraps received at the Hartland transfer station and the Port Renfrew transfer station. Several municipalities who collect kitchen scraps as part of their residential curbside collection services have their own processing contracts with private sector composting facilities.

Municipalities providing yard waste collection or drop off services for their residents typically compost this material at their public works yard or other municipal facility. Some material, such as mulch from leaves collected in the fall, is repurposed for use in parks and restoration projects (e.g. Saanich). Municipally composted yard waste is often available to residents for a modest fee.

Invasive species are accepted at Hartland landfill for disposal.

Challenges/Opportunities

A public survey in 2012 identified that CRD residents wanted to divert organics from the landfill. Since then, all municipalities that collect garbage have implemented kitchen scraps collection programs and a kitchen scraps ban came into effect in 2015. Lack of local processing capacity remains a challenge, but the CRD Board recently directed staff to initiate a new procurement process for in region or near region facilities.

10 Resource Recovery

The fourth level of the 5Rs hierarchy is resource recovery. The Ministry of Environment defines this stage as the recovery of as much material and/or energy from the solid waste stream as possible through the application of technology. The CRD's current solid waste resource recovery project is the gas utilization facility at Hartland which utilizes captured landfill gas to produce electricity.

10.1 Landfill Gas Management at Hartland Landfill

Since 2012, the landfill gas collection rate has increased substantially. The gas utilization facility at Hartland landfill produces enough electricity to power 1,100 homes. This facility is currently the only CRD solid waste resource recovery project in place.

Figure 10-1: Landfill Gas Utilization Facility at Hartland Landfill

As garbage decomposes in the landfill, landfill gas is generated. Landfill gas is primarily methane but also includes other organic compounds. Methane is a powerful greenhouse gas – 20 to 30 times more potent than carbon dioxide. To minimize greenhouse gas impacts, reduce odours associated with landfill gas and reduce risk of fires associated with the buildup of methane, active collection and management of the landfill gas is a critical part of managing Hartland landfill.

Hartland has been collecting landfill gas for about 20 years. Prior to 2004, the collected gas was flared off and thermally destroyed. Since 2004, the gas is used for generation of electricity and only the excess gas above the generator's capacity is flared. The generator typically produces enough energy to power 1,100 homes annually. In 2013, the CRD purchased their private sector partner's portion of the power project which gives the CRD full control over the landfill gas.

A site specific Landfill Gas Management Plan (LFGMP) was approved in 2012 which detailed a strategy for capturing landfill gas and meeting BC Ministry of Environment collection targets. The Plan includes installation, operation and maintenance of collection infrastructure and routine reporting. This has resulted in landfill gas collection increasing by nearly 40% since 2000 and reductions in greenhouse gas

emissions by approximately 50% since 2010. Collection infrastructure continues to be installed in accordance with the LFGMP.

In 2016, the landfill gas collection rate was 61.8%; below the Provincial target rate of 75%. This lower than forecast collection rate is attributed to reduced waste volumes in recent years. The current landfill gas collection efficiencies are within estimated ranges in the LFGMP. Target efficiencies are expected to be achieved when full build-out of the site is achieved.

10.2 Other Opportunities for Resource Recovery

The CRD has explored other solid waste resource recovery opportunities. In 2011, the CRD, Cowichan Valley and Regional District of Nanaimo collaborated on a feasibility study for a waste to energy facility to serve all three regional districts and a subsequent study was completed to assess the costs of a facility to serve the needs of the CRD only.

In its 2015-2018 Strategic Plan, the CRD Board indicated that pursuing Integrated Resource Management (IRM) was a strategic priority. IRM is defined as the integration of solid and liquid wastes, using currently landfilled or diverted materials along with biosolids, to maximize resource recovery through combined processing of some, or all, of these materials. Since 2015, the CRD has advanced planning of IRM through a number of committees. The committees conducted extensive research on technologies and considered a number of technical reports, a draft project plan outline, a gap analysis, case studies across Europe and North America, and a summary of potential policy and project implications for procurement, including project criteria and risks. In January 2018, the CRD Board decided to conclude the IRM procurement process and to pursue individual resource recovery plans for the region's waste streams.

The CRD will continue to explore IRM opportunities as part of the CRD's SWMP process. As noted earlier, in January 2018, the CRD Board directed staff to pursue an in-region, or near region, organics processing facility by initiating a new procurement process. The project may be a step towards IRM, depending on location. The CRD is also investigating and developing a business case for renewable natural gas (RNG) infrastructure at Hartland landfill to optimize the beneficial use of Hartland's landfill gas. The Hartland landfill site offers integration opportunities for shared solid and liquid waste infrastructure and site services.

Challenges/Opportunities

The CRD will continue to maximize existing resource recovery and investigate new opportunities. Staff are currently exploring options to increase Hartland landfill gas power production or upgrade the gas to renewable natural gas.

11 Residual Waste Management

Residual waste refers to the component of the waste stream that is not reused, recycled or composted and requires disposal. This section describes the residual waste management system in the CRD, from collection to disposal.

11.1 Collection Services

As with kitchen scraps, six municipalities in the region collect garbage at the curb from single family homes, either by way of municipal collection staff or through a contracted service. In areas without municipal garbage collection, residents must bring their garbage to a local drop off location or hire a private garbage collection service. Not all areas in the CRD have private garbage collection services for residents.

Multi-family buildings and the ICI sector contract garbage collection to private service providers.

11.2 Transfer Stations

The CRD owns and operates a transfer station in Port Renfrew. Source separated recyclables and kitchen scraps are accepted at the site for recycling. Garbage is transferred to Hartland landfill.

Additionally, there are several private transfer stations in operation in the CRD. Many of these sites offer recycling services as well.

Transfer stations on Salt Spring Island are subject to Capital Regional District Bylaw 2810, a Bylaw to Regulate the Operation of Transfer Stations on Salt Spring Island which requires all transfer stations to hold a license. This bylaw was put in place to ensure that all transfer stations on the island are operated at a level that ensures the protection of environmental and community health.

11.3 Hartland Landfill

Hartland landfill is located 14 km northwest of Victoria and is the only engineered sanitary landfill in the CRD. The 125-hectare site, which includes 48 hectares of landfill area, is owned by the CRD and operated by a combination of CRD staff and contractors.

Hartland landfill began as an unregulated dump site in the mid-1950s. In 1985, the CRD took over operation of the site. Since that time, over $40 million has been invested in site infrastructure and environmental controls to create an award-winning engineered sanitary landfill.

Figure 11-1: Aerial View of Hartland Landfill

The Hartland landfill site is a multi-purpose facility that includes the following waste management functions:

- Disposal and landfill service for residential and commercial customers;
- Disposal facility for controlled waste[12];
- Recycling depot;
- Product Stewardship and HHW area;
- Salvage area for reusable goods;
- Yard and garden waste collection; and
- Kitchen scraps transfer station.

In 2013, the Minister of Environment approved Amendment No. 8 of the current SWMP which allows the siting of a biosolids treatment facility at Hartland landfill. A Residuals Treatment Facility will be constructed at Hartland North, with completion expected in June 2020.

[12] Controlled wastes are materials that are not suitable for disposal on the active face of the landfill because of specific health and safety or environmental concerns associated with the physical or chemical properties of the waste. Items that are considered controlled waste include animal feces, sewage contaminated grit, catch basin waste and dead animals.

11.3.1 Phase 1 and Phase 2 History

Phase 1 is the original part of Hartland landfill that was completely closed by 1998. This area was filled with approximately 4.5 million cubic metres of garbage. It is permanently covered with a specially designed durable plastic liner and soil cap.

The Final Closure design for Phase 1 was completed in 2010 which included a final cover complete with a new wetland sedimentation pond in addition to gas, leachate and road upgrades. More than 22,000 native trees and bushes have been planted over Phase 1 of the Hartland landfill.

Phase 2 refers to the current active Hartland landfill site which was officially opened on April 30, 1997. It consists of a system of liners and drains to provide for long-term engineered, environmentally secure waste disposal.

Figure 11-2: Closed Phase 1 Area with Replanting

Phase 2 is able to accept approximately 10.3 million cubic metres of solid waste. The most recent final closure was of the north face of Phase 2 Cell 1 in 2011. In 2016, progressive closure of the East and South Faces of Phase 2 Cell 2 was put in place and construction and initial filling of a new landfill cell (Phase 2 Cell 3) began.

11.3.2 Infrastructure

In addition to the landfill itself, the site has other infrastructure that supports its operation. This includes a staffed scale house that weighs all incoming and outgoing vehicles and an automatic scale for major account holders. Weighing of vehicles allows the CRD to track the quantity of the waste received at the facility and to charge fees based on the weight of waste deposited at the site.

Other infrastructure is associated with pollution control and includes leachate and landfill gas management infrastructure. The gas management infrastructure was described in Section 10.1 on Resource Recovery. The leachate management system is described below.

Leachate Management

Water that has filtered through garbage is called leachate. To minimize the leachate generation area, impermeable covers are installed as cover on the landfill and perimeter ditches are lined to divert more clean surface water away from the landfill. The leachate generated in the landfill is contained and conveyed via a micro-tunnel to two leachate storage lagoons. The leachate is tested on a once-a-month basis and released into the local sewer system.

11.3.3 Monitoring

An environmental monitoring, assessment and management program to identify potential impacts of landfill operations on groundwater, surface water and air, is in place in accordance with BC Ministry of Environment requirements. With over 40 years of engineered controls and continuous improvement, groundwater and surface water quality at Hartland Landfill has improved. Monitoring stations includes a series of test wells both on and off the landfill site.

The 2016 landfill gas collection efficiencies were within estimated ranges in the Landfill Gas Management Plan, working effectively and reducing greenhouse gas emissions from closed areas of the landfill. New gas wells installed in Phase 2 as part of the long-term gas management plan resulted in gas infrastructure improvements.

The progressive closure of the East and South Faces of Phase 2 Cell 2 that occurred in 2016 reduced the total leachate generation area of the landfill.

The newly constructed Phase 2 Cell 3 area included installation of new leachate containment with gravity flow conveyance piping that discharges into the upper leachate lagoon. Groundwater quality monitoring data obtained in 2016 indicated that landfill leachate is effectively contained and controlled on site.

Leachate quality monitoring, done at the point that it is discharged to the sewer system, confirms that leachate discharged from the site is in compliance with the CRD's Sewer Use Bylaw which regulates discharges to the sanitary sewer. Surface water monitoring in 2016 indicated that nearby surface water bodies are not impacted by leachate.

11.3.4 Estimated Lifespan

Based on current estimates and assuming no major changes to the volume of waste being disposed, the landfill is expected to be full around 2049.

11.3.5 Disposal Bans

Over the years, the CRD has sought to ensure the conservation of Hartland landfill space and valuable resources. The practice of banning the disposal of specific wastes at Hartland landfill when viable recycling alternatives are in place, has been used by the CRD since 1991. Current landfill bans include drywall (implemented in 1991), cardboard, directories, large appliances, tires (1993), scrap metals (1995), fill materials (1995), paper (1998), yard and garden waste (2006) and EPR materials designated under BC's recycling regulation (2011). The ban on kitchen scraps was implemented in 2015.
It is estimated that these bans have diverted over 600,000 tonnes of material from the landfill. Figure 11-3 shows the effects that landfill bans have in reducing the tonnages of banned materials over a 26-year period.

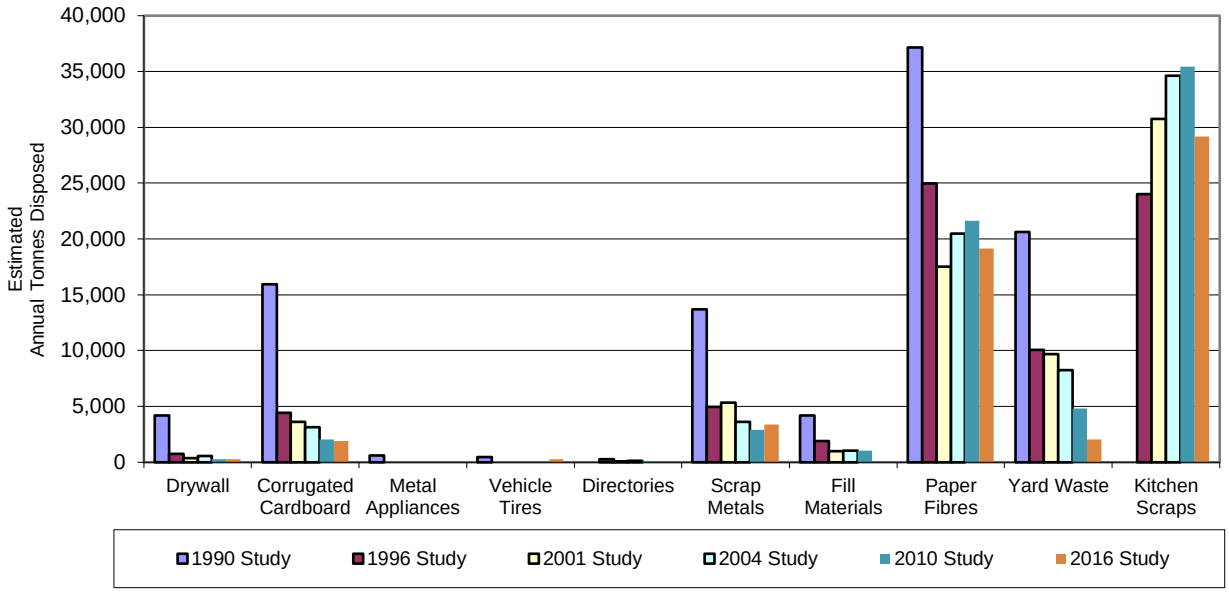

Figure 11-3: Effect of CRD Disposal Bans 1990-2016

11.3.6 Landfill Disposal Charges

The CRD charges different tipping fees for different types of waste materials, to reflect the challenge of managing a particular waste type (e.g. asbestos containing materials are charged a higher tipping fee than regular garbage because they require a greater degree of management) or to encourage materials to be source-separated for recycling instead of disposal (e.g. loads of yard waste are charged a lower tipping fee than regular garbage).

Tipping fees are intended to reflect the cost of providing the landfill service as well as act as an incentive to reduce, reuse or recycle waste materials. Since 1989, the tipping fee for regular garbage has increased from $16 to $110 per tonne in 2018.

Some items received at Hartland landfill are charged on a per tonne basis. A minimum charge and a $10 user fee are applied to materials received at the public drop off area. A list of 2018 tipping fees and user charges is presented in Table 11-1.

Table 11-1: 2018 Tipping Fees at Hartland Landfill

Type of Waste Material	Tipping Fee
General refuse	$110/tonne
Bulky waste	$254/tonne

Asbestos containing material	$157/tonne ($500/tonne for out of region)
Kitchen scraps	$120/tonne
Yard and garden waste	$59-$110/tonne
Clean demolition waste[13]	$110/tonne
Recyclable materials	$6 for residential users $26 for small commercial haulers
EPR materials	No charge
Controlled waste	$157-$500/tonne

11.3.7 Disaster Debris Management Planning

A significant volume of waste can be generated during a natural disaster, such as a flood, landslide, earthquake, tsunami or significant storm event. There have been disaster experiences where the amount of debris generated was equivalent in volume to years, and sometimes decades, of typical solid waste volumes requiring disposal. Experience in other locations has shown that in these situations, significant landfill capacity is consumed; many tonnes of waste are burned; and ad-hoc disposal sites have been established without adequate environmental consideration (including the disposal of hazardous wastes). Consequently, the long-term financial and environmental costs can be devastating for areas that are not prepared.

Disaster Debris is technically not municipal solid waste and is not a required component of the solid waste management plan. Municipalities, however, are required to have in place their own disaster management plans and the CRD is responsible for disaster debris management planning in the Electoral Areas and Hartland landfill. To improve disaster preparedness, the CRD has expertise to assist municipalities in identifying disposal sites and planning in this regard. CRD staff have been following the work of the Integrated Partnership for Regional Emergency Management (IPREM) in Metro Vancouver who are working on a disaster debris management operational plan. The CRD would like to minimize the impact of disaster debris on Hartland landfill, which has been built to withstand seismic events.

11.4 Private Disposal Facilities

There is one private disposal facility in the CRD, the Highwest Waste Management Facility (HWMF) in Victoria, which is currently owned and operated by Tervita. The following is a description of the site based on the 2011 Design and Operations (D&O) Plan prepared by Conestoga-Rovers and Associates.

[13] A hazardous materials assessment is required for material to be accepted.

11.4.1 Highwest Landfill

The Highwest property is located on a 22.8 hectare parcel of land located at 1943 Millstream Road. The approximate location is shown in Figure 11-4.[14] The legal property description is: District of Highlands, British Columbia within Section 15, except those parts in plans 7077, 7599 and 16010, Range 3 West.

Figure 11-4: Location of Highwest Landfill

The Highwest Landfill's D&O Plan includes:

- Fill plan
- Designs for the future landfill cells and leachate collection system
- Final contour plan
- Landfill gas management plan
- Environmental monitoring plan

The site is currently regulated under the existing operating certificate (OC), dated September 24, 2009, and the authorized works include the selected waste landfill and related appurtenances. The OC supersedes Waste Management Permit PR-05280 issued on April 10, 1979 and amended on April 19, 1995. The OC permits 22,500 tonnes of non-putrescible waste per year to be landfilled. Therefore, the

[14] Map taken from Highwest Landfill 2011 Design and Operations Plan by Conestoga-Rovers and Associates

material it receives for disposal includes construction and demolition debris and non-hazardous industrial and commercial discards.

Landfill Design

The Highwest facility was originally developed as a natural attenuation landfill. A monitoring program is in place to assess compliance with permit requirements at the property boundary. When the landfill was incorporated into the CRD's SWMP in 2009 a larger landfill footprint was approved and a leachate management plan was developed. The full landfill footprint has since been developed meeting approved minimum buffer zones and boundary setbacks.

The landfill is divided into eight cells. As per the D&O plan, the landfill base has been lined in accordance with the Landfill Criteria (i.e., a Primary liner consisting of 1.5 millimetre thick HDPE geomembrane liner and a Secondary liner of Geosynthetic Clay Liner or 0.75 meter thick compacted clay liner with a minimum hydraulic conductivity of 1 x 10-7 cm/sec). Progressive final cover placement will be carried out in areas of the landfill that have reached final waste contours. The final cover will comprise a compacted low permeability material, comprising of 0.6 metre, measured perpendicular to the slope, of low permeability (less than 1 x 10-7 cm/s) compacted soil or equivalent, placement and vegetation of a minimum 150 millimetres of topsoil, a minimum top slope of 10 percent, and a maximum side slope of 33 percent). A Low Linear Density Polyethylene (LLDPE) cap structure was installed on approximately 37,150 m^2 of the landfill footprint in 2016 and 2017 as progressive closure occurs.

The leachate collection system at the site includes toe drains and cleanout risers, stone drainage blankets and collection piping, interceptor pipes and collection sump. In 2016, the leachate management system was modified due to the expansion of Cells 3 and 4. These modifications entailed reducing the leachate storage system from 12 smaller tanks to two larger tanks. The plans were updated and submitted to the Ministry of Environment.

Highwest Landfill is considered a regulated landfill under the Landfill Gas Management Regulation (LFG Regulation) due to its annual disposal capacity. To satisfy the criteria of the Operating Certificate, in 2014 a LFG generation assessment was completed as per the requirements and procedures of the LFG Regulation and the Landfill Gas Assessment Procedure Guidance. Based on this assessment, methane generated annually at the site was estimated at 286.5 tonnes which is below the LFG Regulation threshold of 1,000 tonnes. As a result of this assessment, no further action was required by Tervita and the next assessment is due January 1, 2020.

According to the site's 2016 Annual Report, the remaining capacity of the landfill is estimated to be 244,000 cubic metres, and the remaining site life was approximately seven years (2023).

A Material Recovery Facility (MRF) at the site allows for the segregation and recovery of clean wood material and other recyclable/reusable materials from the incoming waste streams. The MRF is located in a lock-block, asphalt enclosed area to improve product quality control and site drainage. Wood waste such as logs, stumps, and branches, are processed to produce hog fuel for off-site markets as a potential energy source. Wood material sorted from the incoming CR&D waste stream is processed to produce a biomass fuel to be used as an energy source at off-site Energy-From-Waste facilities and other approved end use products. Ferrous materials and any other materials with recyclable/reusable potential are recovered and transported off-site to the appropriate recycling facilities.

11.5 Closed Landfills

This section provides a brief description of public and privately owned landfills within the CRD that have been permanently closed.

11.5.1 Blackburn Road Landfill

The Blackburn Road landfill site is located on Salt Spring Island on approximately 0.7 hectares of privately owned land. The landfill began operation in 1966 under the provincial discharge permit # PR-1839 and was ordered closed by the Province on July 18, 1991 for environmental reasons.

11.5.2 Galiano Island Landfill

The Galiano Island landfill is situated on approximately 0.3 hectares of land privately owned by MacMillan Bloedel Limited. The site began accepting solid waste in 1972; however, the Province did not issue a pollution control permit (# PR05559) for this site until October 1979. The landfill site was operated by the Galiano Club, a non-profit volunteer organization, under a signed agreement with MacMillan Bloedel Limited. On October 31, 1991, the agreement with MacMillan Bloedel expired and MacMillan Bloedel indicated that it was not interested in renewing the permit to allow for solid waste to continue being disposed on its property. However, MacMillan Bloedel did offer to sell the site to the residents of the island for continued use as a landfill site. On October 19, 1991 Galiano residents, by referendum, rejected the proposal to purchase the land. The Galiano Club, being the permittee for the landfill operation, therefore directed that the site be closed on October 31, 1991 and requested that the Province cancel its permit. The site has been fully closed.

11.5.3 Saturna Island Landfill

The Saturna Island landfill site is located on approximately 0.2 hectares of privately owned land. The site was operated by the Saturna Community Club for a number of years without a permit, until June 14, 1973 when pollution control permit # PR-2083 was issued by the Province to the community club to operate the landfill. In 1992, after being advised by the CRD of its intention to eventually consolidate solid waste to landfilling at Hartland landfill, the community club directed that the site be closed after July 1, 1993. The site has been fully closed.

11.5.4 Port Renfrew Landfill

The Port Renfrew landfill is located on approximately 0.5 hectares of land privately owned by Fletcher Challenge Canada Limited. The permit to operate a landfill on the site (# PR-2321) was first issued to B.C. Forest Products Ltd. on January 22, 1974, authorizing them to discharge 27 cubic yards per day of domestic and industrial (wood) waste from the logging operation at Port Renfrew. In June 1988, the permit was revised to only authorize the disposal of domestic solid waste at a rate of 5.4 cubic metres per day from the community of Port Renfrew. In October 1989, Fletcher Challenge, the permit holder for the site, requested that the permit be cancelled and the site permanently be closed. The site has been fully closed.

Challenges/Opportunities

Hartland landfill is a significant regional asset. Maximizing air space and the life of the landfill remain the top challenge and priority. Since 2012, the CRD has optimized landfill operations by lowering the

garbage to cover ratio and increasing the compaction rate. Staff are continually assessing landfill capacity and investigating design options and fill concepts to extend the life of the landfill to 2100 and beyond. The potential closure of the Highwest landfill could be a challenge as it may result in an increase in construction and demolition material tonnages at Hartland.

12 Construction and Demolition Waste Management

Construction, renovation and demolition projects (CR&D) projects generate a wide range of materials, most of which are reusable or recyclable, depending on local markets. These include concrete, asphalt, wood, gypsum wallboard, metal, cardboard, asphalt roofing and plastic. The CRD promotes diversion of these materials through disposal bans on cardboard, drywall, metal, and concrete.

In 2013, WorkSafeBC BC introduced new regulations for handling materials that may contain asbestos. Asbestos is a group of mineral fibres that resist fire, heat and electricity. Renovating and deconstructing houses containing asbestos products can release asbestos fibres into the air; and inhalation of asbestos fibres can lead to lung scarring and cancer; hence the new handling regulations. Some of the most common asbestos containing materials include vinyl sheet flooring/vinyl floor tile, drywall joint compound (from drywall installed pre 1990), plaster and ceiling tile, stucco, and central heating taping, wrap and gaskets from furnaces.

Asbestos containing material (ACM) is accepted by appointment at Hartland landfill, providing the customer meets a number of conditions. These include:

- The ability to provide a laboratory analysis (required for disposal of drywall containing asbestos)
- Delivering the ACM as a covered and secured load with the material double bagged and sealed in 6 mil poly asbestos bags
- For loads that weigh more than 1,000kg, and those transported by commercial haulers, a waste manifest is required and the driver/vehicle must be licensed to haul ACM
- Wearing high visibility vests and safety boots at the ACM disposal site

Disposal of ACM coming to Hartland from outside the CRD requires a disposal request form. The charge for out-of-region ACM is $500/tonne (compared to $157 for ACM from within the CRD).

Starting April 2018, customers using the public bin drop off area to dispose of renovation waste have to be pre-approved by submitting a hazardous material survey or test results to prove that the materials do not contain asbestos.

Uncontaminated drywall is not accepted for recycling at the Hartland facility, but can be recycled at local private facilities.

There are several facilities in the CRD that accept source-separated CR&D materials for recycling. It is believed that a significant portion of CR&D waste is recycled or used as a fuel substitute, including:

- Wood waste is chipped and used as hog fuel at pulp mills on Vancouver Island and Washington State
- Clean drywall (gypsum) is recycled
- Metal is recycled
- Concrete and asphalt are recycled
- Asphalt shingles are recycled on a limited basis

There is also significant reuse of building materials and fixtures through salvage operations and retail stores such as Habitat for Humanity's ReStore.

The Tervita Highwest Landfill accepts mixed loads of non-hazardous CR&D waste for disposal. Hartland landfill also receives CR&D waste for disposal, provided that the load does not contain banned materials.

Challenges/Opportunities

Because CR&D waste management is largely conducted by the private sector, the quantity of CR&D waste recycled and disposed is unknown. There are opportunities to divert clean wood waste from landfilling. New WorkSafe BC regulations around handling of asbestos containing materials is a more recent issue of concern and has resulted in different procedures at the landfill to ensure CR & D waste received is clean of hazards. Increased awareness of the safe handling of hazardous materials will protect workers and residents who are renovating their homes.

13 Land Clearing Waste Management

Land clearing waste refers to trees and stumps removed when land is cleared for development. Because of the large and bulky nature of this material, it is difficult to manage at municipal solid waste landfills and composting facilities. In most areas of the CRD, open burning of land clearing waste is prohibited. In these areas, land clearing debris is often ground on site using a mobile grinder and left on the property, or the land clearing waste is transported to a facility for storage and subsequent grinding. There are no permitted burn sites for land clearing waste in the CRD.

14 Household Hazardous Waste

Household hazardous waste (HHW) refers to products that can pose a hazard to human health and the environment if disposed of improperly. This includes products such as motor oil, batteries, paint and pesticides. Most potential HHW is included in the Recycling Regulation and therefore industry-provided take-back (EPR) programs are in place. However, some products (e.g. glues, pool chemicals) are not currently included in the regulation and containers of HHW without labels are not accepted by take-back depots.

Consequently, in 2004, the number of items collected at the Hartland public drop off area was expanded to include non-EPR household hazardous waste (HHW). This expansion provided the region's residents with a 'one-stop' drop for virtually all of their HHW. The material is accepted in residential quantities only, at no charge, for recycling (where feasible) or disposal at a special waste management facility. In 2016, the HHW area at Hartland landfill collected 50 tonnes of non-EPR HHW.

Challenges/Opportunities

There is currently no charge to drop off HHW at the Hartland public drop off area. Management of these materials is becoming increasingly expensive which is a challenge. Hartland is the only location in the region accepting HHW which may be a barrier to ensuring HHW is properly disposed of. There are opportunities to advocate for more HHW products to be included in the BC Recycling Regulation.

15 Illegal Dumping

Illegal dumping and waste abandonment are common issues for most local governments and waste management facilities in the province. Abandoned Waste is waste placed in public spaces, like boulevards, or at non-profit organizations, often with the intention of re-using, but ending up as garbage. Illegal dumping is waste purposefully left in private or public areas instead of using proper recycling or safe and legal disposal methods.

In 2011, the CRD surveyed municipalities, recycling depots and non-profit recyclers to determine levels (volume and frequency), impacts (costs and time) and trends (seasonal variations and locations) associated with illegal dumping behaviours. The information received revealed that the most common materials illegally discarded were furniture and mattresses, while the most frequent location was on municipal boulevards.

While tipping fee increases and landfill restrictions are perceived to be the primary reasons for this activity, there are many factors for this behavior, including lack of knowledge regarding disposal options and the cost of removal services.

To reduce the prevalence of illegal dumping, the CRD:

- Conducted a targeted communication campaign in 2013 and has participated in producing an on-line video (done in conjunction with the Association of Vancouver Island and Coastal Communities);
- Provides funding to non-profit associations to conduct clean-up events in public places, called the Community Clean-up Program. In 2017, the CRD Board expanded the scope of the program to provide funding for the removal of abandoned boats and education in order to take advantage of a new federal funding program. The Board also approved some funding for marine debris removal.
- Supports non-profit organizations involved in recycling clothing and used household goods by providing funding towards the disposal and recycling of unusable materials received as donations and by providing safe disposal of abandoned hazardous materials through the CRD HHW collection at Hartland; and
- Maintaining a page on illegal dumping on the CRD website that provides information on how to reduce illegal dumping and abandonment.

Challenges/Opportunities

Illegal dumping remains an on-going challenge, particularly in urban areas where pick-up of abandoned waste results in significant cost to municipalities. The CRD can support responsible management of unwanted materials by providing education about reuse and recycling opportunities and proper disposal.

16 Education and Outreach

The CRD has a number of education and outreach programs that support all solid waste diversion services in addition to promoting long-term behaviour changes to enhance participation in the first 3Rs. These behaviour changes contribute significantly to the diversion of waste from landfill. The CRD's education services include:

- A school outreach program
- The Hartland Learning Centre
- Landfill Tours
- An online search engine called *MyRecyclopedia.ca*
- Information Desk; 250-360-3030 and infoline@crd.bc.ca
- CRD website: www.crd.bc.ca
- Participation in Vancouver Island EcoStar Awards
- Presentations, media advertising, campaigns, social media and outreach displays throughout the year on a wide array of topics at a wide range of venues.

16.1 School Outreach Program

The CRD offers free workshops and interpretive tours for Grades K-12. The program supports BC Ministry of Education learning outcomes for social studies, personal planning, language arts, science and math. Over the course of 2016, 76 presentations were made, engaging almost 2,000 school pupils in the region.

16.2 The Hartland Learning Centre

The Hartland Learning Centre was opened during waste reduction week on October 18, 2011 at Hartland landfill. The centre provides a venue for classroom and group presentations. The building is a recycled former cottage from Langford, which was once a fully functional residential home. The Learning Centre is the venue for school workshops, as well as community workshops and tours.

16.3 Landfill & Recycling Tours

The CRD provides site tours of Hartland landfill for individuals or groups upon request. In 2016, tours were provided to 58 school groups and six community groups (almost 1,800 participants). An additional 13 technical tours were provided.

16.4 MyRecyclopedia.ca

The CRD maintains a website at http://www.myrecyclopedia.ca/. The website provides information how to reduce, reuse and recycle in the Capital Region, along with the environmental story behind each item, and tips on how to reduce and reuse in daily living. Information is searchable by product type and facility location. Information is kept up-to-date by CRD staff. MyRecyclopedia.ca receives over 200,000 web visits per year.

16.5 Information Desk

The Info Desk (Tel: 250-360-3030; Email: infoline@crd.bc.ca) is an essential part of the CRD education and outreach programs. This service responds to waste reduction, waste management and general Hartland inquiries. In 2016 the Info Desk responded to 2,616 phone calls and 1,402 emails.

16.6 EcoStar Awards

The annual Vancouver Island EcoStar Awards presented by the Synergy Sustainability Institute recognize outstanding environmental achievements and leadership by businesses, organizations and individuals. In 2017, the CRD sponsored four categories:

- Greenest Restaurant which recognized one small & one large restaurant each demonstrating action to reduce waste, energy, water consumption, pollution and greenhouse gas emissions
- Climate Action which recognized an organization or business that is working to reduce/mitigate greenhouse gas emissions
- Waste Management which recognized an organization or business that has managed and measurably reduced and diverted waste
- Water Conservation Award for an organization or business that has made dedicated effort to conserve drinking water, with measurable results.

Challenges/Opportunities

In a 2012 public survey, residents identified a wish for more education about waste reduction and recycling. The CRD is always exploring new ways of educating residents, for example, by piloting adult landfill tours and embarking on a new Love Food, Hate Waste Canada campaign. There are opportunities for working with stewards on standardizing messages across the province.

17 Financing of CRD Solid Waste Services

The 2016 capital and operating expenditure budget for CRD's solid waste services was $19.5 million. This budget covered all activities at Hartland landfill, all solid waste diversion programs, solid waste planning, debt servicing, and a reserve fund for post-closure monitoring and maintenance of the landfill.

A breakdown of the CRD's solid waste system revenues and costs in 2016 is provided in Table 17-1.

Table 17-1: CRD Solid Waste Management Budget

Revenues		% of revenue
Tipping Fees	$17,145,726	69%
EPR Programs	$5,883,654	24%
Power Plant	$369,840	1%
Recycling Program Revenues	$1,161,092	5%
Permits, Fines & Misc.	$127,534	1%
TOTAL	$24,687,846	100%
Costs		**% of Costs**
Recycling Collection Programs	$6,110,331	31%
Landfill Operations	$4,874,202	25%
Hartland Diversion Programs	$2,956,421	15%
Capital Spending	$2,630,772	14%
Power Plant Costs	$1,103,658	6%
Debt Charges	$645,955	3%
Closure & Post-Closure Fund	$447,286	2%
Equipment & Vehicle Fund	$302,864	2%
Planning	$205,952	1%
Community Support Programs	$209,105	1%
TOTAL	$19,486,546	100%
Surplus	$5,201,300	

In the CRD, the majority of funding has traditionally been drawn from landfill tipping fees, with a significant funding source from the PPP EPR program being added in 2014. The sale of recyclable materials, revenue from power generated through landfill gas utilization, and fees and permit remittances round out the revenues. No revenue is received from taxation. There is a common misconception that recycling and other waste diversion programs are 'free' or cost-neutral. In reality, the cost of diversion is greater than landfilling, but diversion of materials results in saving valuable resources and landfill air space.

In times of economic prosperity and growth there is a correlation to increases in tipping volumes (and therefore healthier revenues). Conversely when economic activity dips a resulting decline in landfill volumes is evident.

A sustainable financial business model is essential for the provision of solid waste services. One of the most significant challenges for the CRD in the future will be the funding of diversion programs. Because these programs have been funded from tipping fees associated with disposal, the success of these programs has resulted in less waste being landfilled and consequently less revenue to fund the programs. In order to continue to enhance diversion programs and decrease the amount of waste landfilled, a discussion on alternative mechanisms for funding diversion programming is anticipated.

Because of the success of waste diversion programs and policies resulting in less waste sent to disposal, the CRD has been anticipating that there will inevitably be a point where revenues will not cover the CRD solid waste system costs. The CRD's solid waste function currently has a healthy sustainability reserve fund however, a model for the long-term financial sustainability of the CRD solid waste function is needed.

The CRD is not alone in seeking sustainable funding models for its solid waste system. In 2014, Metro Vancouver submitted a bylaw to regulate waste flow to designated facilities in their region to the province; however, the Minister of Environment rejected the bylaw. Metro Vancouver subsequently reduced tipping fees for large commercial loads, thus sending a positive price signal to private waste hauling customers. Recently, Metro Vancouver approved a "generator levy" on waste to provide base funding of their system, and has asked the province to approve a hauler licensing program.

Challenges/Opportunities

EPR programs, especially the PPP program, have reduced program costs for the CRD; however, funding diversion programs with disposal revenues is unsustainable as the CRD continues to progress towards reducing the per capita amount of waste disposed. The long term financial sustainability of the CRD solid waste function remains a critical issue.

18 Solid Waste Management Plan and Core Area Liquid Waste Management Plan Alignment

The Hartland landfill site is the link between the region's Solid Waste Management Plan and the core area's Liquid Waste Management Plan.

In 2013, the Minister of Environment approved Amendment No. 8 of the current SWMP. This Amendment brought the SWMP into alignment with the Core Area Liquid Waste Management Plan by allowing the siting of a biosolids treatment facility at Hartland landfill.

In 2016, the Minister of Environment provided Conditional Approval of Amendment No. 11 to the Core Area Liquid Waste Management Plan (CALWMP) for the CRD Wastewater Treatment Project. The Wastewater Treatment Project will provide tertiary treatment for wastewater from the core area municipalities of Victoria, Esquimalt, Saanich, Oak Bay, View Royal, Langford and Colwood, and the Esquimalt and Songhees First Nations. The Project will be built to meet provincial and federal regulations for treatment by December 31, 2020.

The Wastewater treatment facility will be located at McLoughlin Point in Esquimalt and will provide tertiary treatment to the core area's wastewater. Residual solids from the facility will be conveyed to a Residuals Treatment Facility (RTF) at Hartland landfill where they will be turned into Class A biosolids. The biosolids are a high quality dried product that will be suitable to several beneficial reuses, including as an alternative energy source. The beneficial reuse will be determined by the CRD through a stand-alone procurement process.

19 Summary of Challenges and Opportunities

The authors identified current and emerging challenges and opportunities throughout the body of the report, which are summarized in Table 19-1 below.

Table 19-1: Summary of Challenges and Opportunities

Waste Composition – Diversion Potential	• Potential challenge to meet Province's per capita disposal rate. • Recyclable, Compostable, and EPR material are being landfilled that could be diverted.
Reduction and Reuse Activities	• High material consumption levels. • Opportunities to encourage the 3Rs, to promote sustainable design, and consider the circular economy.
Recycling (Collection Services)	• Recyclable materials are being landfilled. • Securing ongoing funding for Gulf Island recycling depots. • National Sword (China) policy restricting markets for recyclables. This could encourage local processing capacity and markets. • Lack of Recycle BC PPP recycling collection for multi-family sector. • PPP from the Industrial, Commercial and Institutional sector is not included in the PPP EPR program.
Extended Producer Responsibility	• Multiple EPR programs and locations for items can lead to consumer confusion and frustration. • Opportunities for improved education efforts. • Siting of return depots can involve multiple jurisdictions, and can be resisted at the community level.
Composting and Organics Recycling	• Currently no in-region composting facility, however a procurement process has been initiated (January 2018).
Resource Recovery	• Explore options to maximize Hartland landfill gas utilization.
Residual Management	• Highwest Waste Management Facility (Tervita) has a limited life (2023 without further expansion). • Maximizing airspace at Hartland landfill is a top priority with the goal of extending the life of the landfill beyond 2100
Construction, Renovation and Demolition Waste	• Asbestos containing materials requires special handling and management protocols. • Explore opportunities to divert clean wood waste.
Household Hazardous Waste	• Hartland is only facility in the region accepting non-EPR HHW, which is expensive to handle and manage. Advocate for more to be covered under EPR.

Illegal Dumping	• An ongoing challenge for municipalities. CRD role is to educate.
Education and Outreach	• Opportunities for expanding education campaigns and for working with stewards.
Financing CRD Solid Waste System	• Current financial reserves are healthy in part due to strong economy. • Funding diversion programs with disposal revenue is unsustainable as the CRD work towards reducing per capita disposal rate. Recycling costs more than landfilling.