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Solid Waste Management Plan Review and Update

Stage 1: Existing System Report

Prepared for

Regional District of Nanaimo

12 December 2013

Executive Summary

The Regional District of Nanaimo (RDN) has begun a review and update of the 2004 Solid Waste Management Plan (SWMP) which will be conducted in three stages. The first stage, the subject of this report, is an assessment of the current system and the implementation status of the 2004 Plan.

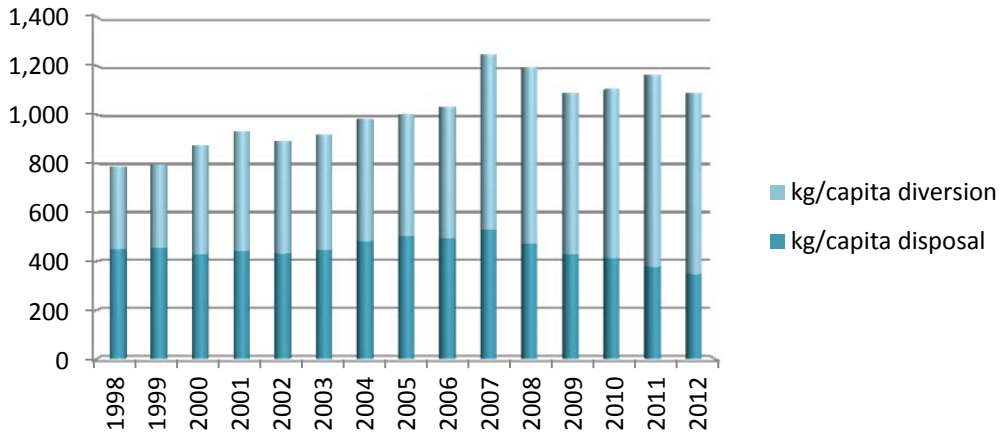
The RDN has fully implemented the key components of the 2004 SWMP, including:

- Banning commercial organic waste from disposal as garbage
- Implementation of an organics collection program for single-family homes
- Implementation of the Waste Stream Management Licensing Regulatory Bylaw
- Expansion of the capacity of the Regional Landfill within the existing property boundary through the construction of a geogrid toe berm.

The successful implementation of the SWMP has resulted in the RDN diverting a significant portion of solid waste away from landfilling to recycling and composting. In 2012, the RDN disposed 52,516 tonnes of garbage and diverted 112,853 tonnes to recycling, composting and extended producer responsibility programs, thereby achieving a diversion rate of 68%.

The per capita disposal (landfilled) rate for the RDN in 2012 was 347 kg per year, one of the lowest rates in British Columbia and across Canada.

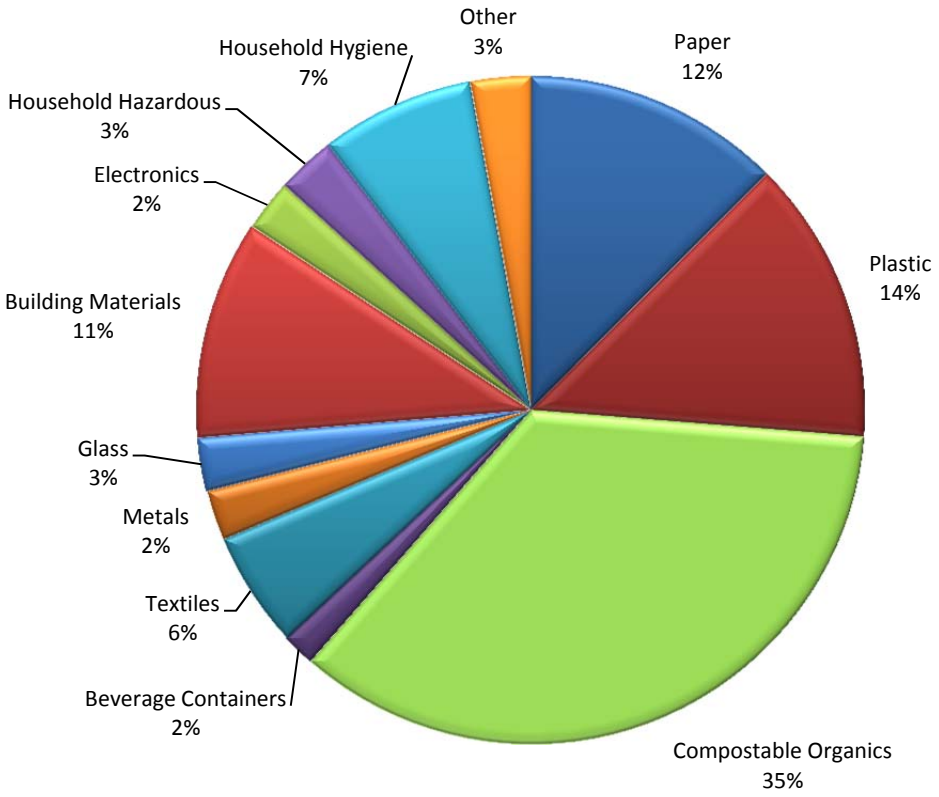
Despite the RDN's success in increasing the amount of diversion, the overall quantity of solid waste generated (the amount landfilled + recycled + composted) continues to increase. The figure below shows per capita waste generation data from 1998 to 2012.



The existing solid waste management system in the RDN is diverse and reflects a mature waste management system. The key components of the existing system are:

- The adoption of "zero waste" as the waste diversion target – meaning that the RDN will continuously strive to reduce the amount of waste requiring disposal;
- A Regional Landfill that is designed and operated to maximize environmental protection;
- Curbside collection of recycling, kitchen scraps and recyclables for all single-family homes;
- User pay waste management fees for both the landfill and the curbside collection services;
- A policy of banning materials from disposal as garbage once a stable alternative use is identified
- An organics diversion strategy that enabled diversion of both residential and commercial food and yard waste;
- A Construction/Demolition Waste Strategy that banned the disposal of clean wood waste to drive the development of a recycling industry for waste from construction and demolition activities; and
- A waste stream facility licensing system that ensures that private waste management facilities operate at a high standard.

In the fall of 2012, with the zero waste target in mind, and as a first step in updating the RDN's solid waste management plan, the RDN conducted a composition study of the waste sent to the Regional Landfill to determine what types of waste continue to be landfilled and by whom. This pie chart shows the proportion of the various waste materials being landfilled, based on weight. The data from the study indicates that roughly 35% of the waste currently landfilled could be composted and 20% could be recycled.



A review of scale house records indicates the sources of the waste received at the landfill, which are summarized in the table below. This table shows that 57% of the garbage is commercial waste generated by local businesses and institutions, and 22% is generated by homes.

Waste Source Type	Tonnes (2012)	% of waste disposed
Curbside residential waste	8,928	17%
Multi-family residential waste (estimated)	2,626	5%
Commercial waste	29,934	57%
Self-hauled waste[1]	11,028	21%
Totals	**52,897**	**100%**

The RDN's 2012 expenditure for operating the regional disposal system and undertaking a variety of zero-waste initiatives was $17.3 million. Additionally, the 2012 combined expenditure for curbside collection services provided by the RDN, City of Nanaimo and Town of Qualicum Beach was $7.7 million.

[1] Self-hauled waste refers to garbage brought to RDN solid waste facilities by private vehicles (passenger vehicles, pick-up trucks and vans) that manually remove waste from their vehicles. These vehicles are typically driven by residents and small contractors. For safety and efficiency purposes, unloading of self-haul vehicles is segregated from the large, commercial-scale waste collection vehicles that mechanically unload waste.

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1 Introduction

In British Columbia, each Regional District is mandated by the Provincial *Environmental Management Act* to develop a Solid Waste Management Plan that provides a long term vision for solid waste management, including waste diversion and disposal activities. Plans are to be updated on a regular basis to ensure that the plan reflects the current needs of the regional district, as well as current market conditions, technologies and regulations.

The Regional District of Nanaimo (RDN) has begun a review and update of the 2004 Solid Waste Management Plan (SWMP) which will be conducted in three stages. The first stage is an assessment of the current system and the implementation status of the 2004 Plan. The second stage is the identification of options to address the region's future solid waste management needs, the selection of preferred options, and the development of a draft Plan. The third and final stage will be a community consultation process to obtain input into the draft plan and subsequent finalization of the updated Plan. Throughout the process, a combined public and technical advisory committee (the "Regional Solid Waste Advisory Committee") will be involved in the assessment and recommendation of options for consideration by the RDN's Board of Directors.

This report is part of the Stage 1 process and is an overview of the current (2012-2013) system to manage solid waste in the RDN. This report provides data on waste diversion and disposal and provides a description of the solid waste management policies, programs and activities happening within the RDN.

1.1 History of Solid Waste Planning in the RDN

The Province approved the RDN's first Solid Waste Management Plan (SWMP) in 1988. The main elements of this plan were a transfer station, a resource recovery facility and a sanitary landfill to manage the residuals from the facility (estimated to be 20% of the waste stream). The resource recovery plant was never built due to the inability of the facility's proponent to secure financing. Consequently, the RDN's new landfill was receiving 100% of the waste stream and was filling up much faster than anticipated at its inception. As a result, the RDN did a review of their solid waste management plan in 1992 to re-focus the plan on the reduction of waste sent to the landfill. As a result of this review, user pay garbage collection, curbside recycling and a backyard composting program and a disposal ban on cardboard were implemented.

In 1994, a full plan amendment began. This plan amendment was done in two parts. The first was the development of a "3Rs Plan" that was approved in 1996. This plan contained programs and policy initiatives to reduce the RDN's annual solid waste disposal needs by approximately 70%. The two major elements of the plan were the development of a privately built and operated composting facility for source-separated organics and a privately built and operated construction and demolition waste recycling facility.

The second part was the development of a residual waste management plan to address the portion of the waste stream that would not be eliminated or diverted through composting or recycling. The residual waste planning process assessed a wide array of processing and disposal options and conducted detailed

assessments of MSW composting (as a means of further reducing the amount of waste requiring disposal) and waste export (as an alternative to siting a new landfill in the RDN).

A new plan was approved in 2004 that brought together:

- the 3Rs Plan (now called the "Zero Waste Plan" due to the RDN adopting "zero" as their new waste diversion target in 2002);
- the outcomes of the residual waste management planning process; and
- a bylaw to license private solid waste management facilities.

1.2 Implementation Status of 2004 Solid Waste Management Plan

The key components of the 2004 solid waste management plan were:

- **Banning commercial organic waste from disposal as garbage**: This initiative supported the newly opened, privately built and operated composting facility (an objective of the original 3Rs Plan).

- **Implementation of an organics collection program for single-family homes**: This service was fully implemented throughout the RDN, including all municipal areas, by 2011.

- **Implementation of the Waste Stream Management Licensing Regulatory Bylaw**: The bylaw was implemented in 2005.

- **The export of garbage received at the Church Road Transfer Station to the Cache Creek Landfill**: The RDN exported garbage delivered to the Church Road Transfer Station through a contract with the Greater Vancouver Regional District (now called Metro Vancouver) from 1998 to 2005 as a means to preserve space at the Regional Landfill.

- **Expansion of the capacity of the Regional Landfill within the existing property boundary through the construction of a geogrid toe berm**: Construction of the first toe berm was completed in 2004. This expansion allowed for the cessation of waste export and for all RDN garbage to be disposed at the Regional Landfill.

Table 1-1 provides a list of the components of the zero waste plan and the residual waste plan, along with their implementation status at the time of preparing this report. All of the key components of the SWMP have been implemented. The Plan estimated that upon implementation, a diversion rate of 75% could be achieved; however the RDN achieved a 68% as of 2012 indicating that the 75% diversion estimate in the 2004 plan was optimistic. See Section 3.1 for more detail on the RDN's diversion rate.

Table 1-1 Implementation Status of the 2004 Solid Waste Management Plan

2004 SWMP Zero Waste Components	Implementation Status
• Maintain compost education program	Done
• Maintain school education program	Done
• Maintain zero waste promotion and education	Done
• Maintain illegal dumping program	Done
• Continue to expand disposal bans as new diversion opportunities are established	Done. Disposal bans expanded to include commercial organic waste, yard waste, clean wood waste and products managed through EPR programs
• Conduct a waste composition study	Done. Completed in 2004 and 2012
• Provide technical assistance to waste stream management licensees	Done
• Conduct a curbside food and yard waste collection study	Done
• Maintain yard waste collection at RDN disposal facilities	Done
• Maintain recycling services at RDN disposal facilities	Done
• Maintain residential curbside garbage and recycling collection	Done
• Design and conduct a pilot organics collection program	Done
• Conduct a study on the market capacity for construction and demolition waste	Done
• Conduct a review of enhancing user pay for RDN curbside waste collection services	Done. Full user pay not implemented, but current can limit (plus tags) is close to full user pay
• Develop a RDN Zero Waste Policy to help guide RDN purchasing and operations	Not implemented.
• Implement a single family organics collection program (depending on outcome of pilot project)	Done
2004 SWMP Residual Waste Components	**Implementation Status**
• Export waste received at the Church Rd. Transfer Station to Cache Creek landfill until end of 2007	Done
• Export waste out of RDN for disposal **once** the Regional Landfill is full	Regional Landfill is not yet full
• Increase the capacity of the Regional Landfill through the construction of a geogrid toe berm (Phase 1)	Done
• Continue to develop a post-closure plan for the Regional Landfill	Done
• Acquire land for a new transfer station that will support full waste export	Done
• If needed, undertake Phase 2 of the geogrid toe berm at the Regional Landfill	Done
• Undertake a review of New and Emerging technologies that can reduce disposal needs or provide an alternative to landfilling all of the RDN's residual waste	Done

• Continue to promote existing take-back programs operated by product stewardship organizations and encourage the establishment of new stewardship programs	Done
• Maintain the temporary permit for the landclearing waste burn facility on Doumont Road (subsequently renamed Weigles Rd.) until a preferable alternative is in place	Done. Burn permit cancelled in 2006.
• Work collaboratively with other Vancouver Island regional districts to identify cooperative strategies for waste management system improvements	Done
2004 SWMP Other Components	**Implementation Status**
• Implement Waste Stream Management Licensing Regulatory bylaw	Done (Bylaw No. 1386, 2004)

1.3 2010 Solid Waste Management Plan Amendment

In 2009, the RDN updated the Regional Landfill Design & Operations Plan to address issues with Cell one – an area of the landfill that had been closed and capped. The remediation of cell one required that additional garbage be placed on top of the closed cell prior to conducting re-capping the cell. As the Design & Operations Plan was part of the 2004 Solid Waste Management Plan, this change to the landfill's design required a Solid Waste Management Plan amendment. This amendment was approved by the Minister of Environment in August 2010.

2 Plan Area

2.1 Description of the RDN

The Regional District of Nanaimo is located on the central east coast of Vancouver Island. Communities within the regional district include the municipalities of Nanaimo, Lantzville, Parksville, and Qualicum Beach, as well as seven unincorporated Electoral Areas. A map showing the locations of each of these municipalities and areas is provided as Figure 2-1.

The Regional District delivers a variety of regional services that are common to both the electoral areas and municipalities, such as sewage treatment, district recreation, regional parks, solid waste disposal, and transit. The Regional District also provides local services to electoral areas, such as community planning, watershed protection, community recreation, community parks, and utilities. Member municipalities provide similar services within their own jurisdictions.

The RDN is governed by a 17-member Regional Board, comprised of ten directors from locally-elected municipal councils, and seven directors elected by Electoral Area residents.

2.2 Demographic Data

BC Stats reports the 2011 population for the Regional District of Nanaimo as 146,574. Of this number, 26% (37,550) lived in electoral areas and the remaining 74% (108,075) lived in municipalities.

Name	2011 Population[2]
Lantzville	3,601
Nanaimo	83,810
Parksville	11,977
Qualicum Beach	8,687
Electoral Area A	6,908
Electoral Area B	4,045
Electoral Area C	2,834
Electoral Area E	5,674
Electoral Area F	7,422
Electoral Area G	7,158
Electoral Area H	3,509
First Nation Reserves	949
Total for RDN	**146,574**

[2] At time of writing, BC Stats reports varying numbers for RDN population, likely due to revisions happening as 2011 Census data is refined. The source of the data is: http://www.bcstats.gov.bc.ca/StatisticsBySubject/Census/2011Census.

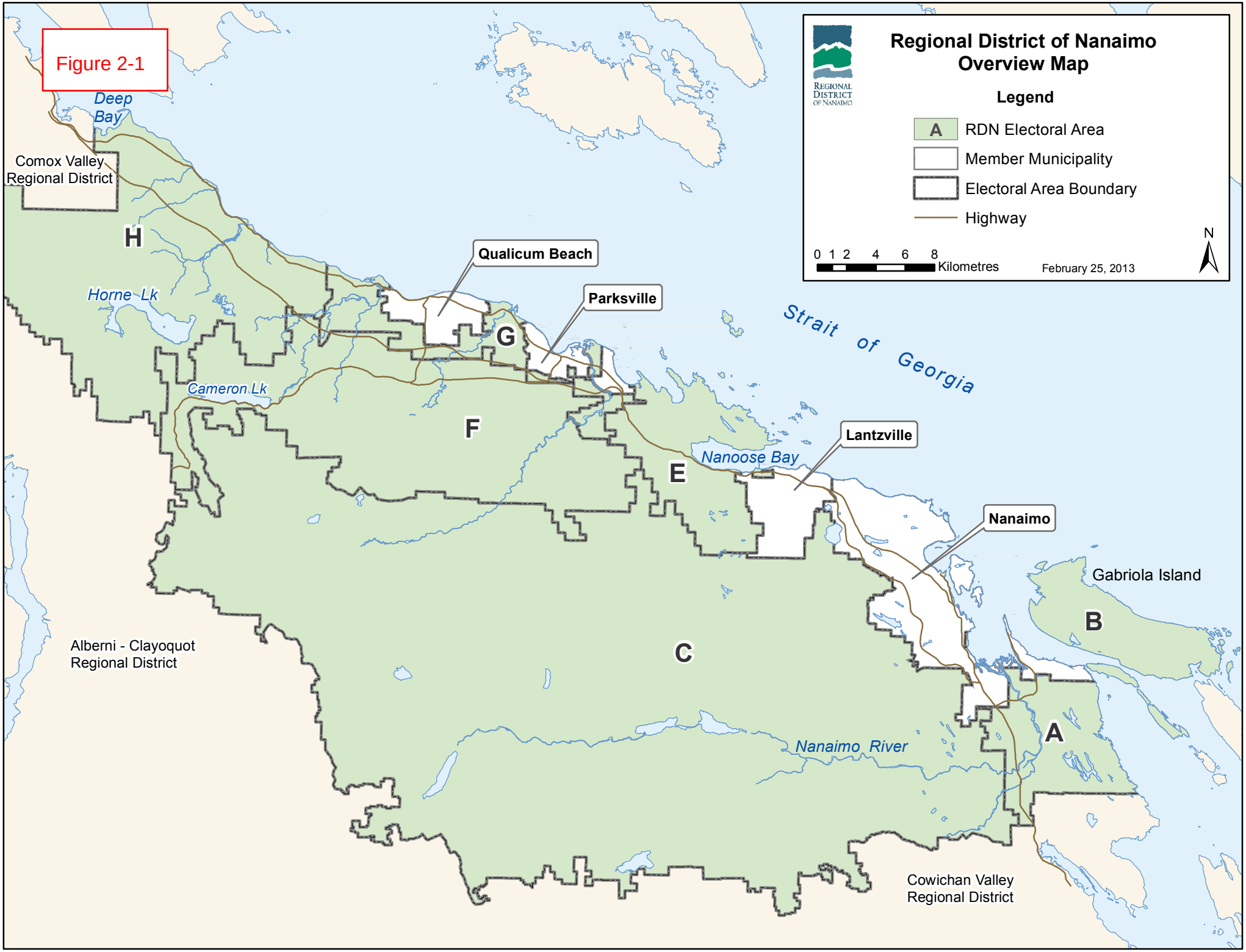


Figure 2-1
Regional District of Nanaimo
Overview Map
Legend
A RDN Electoral Area
Member Municipality
Electoral Area Boundary
Highway
0 1 2 4 6 8
Kilometres
February 25, 2013
N
Deep Bay
Comox Valley Regional District
H
Horne Lk
Qualicum Beach
Parksville
G
Strait of Georgia
Cameron Lk
F
Lantzville
Nanoose Bay
E
Nanaimo
Gabriola Island
B
Alberni - Clayoquot Regional District
C
A
Nanaimo River
Cowichan Valley Regional District

The population of the region increased from 77,624 residents in 1981 to 146,574 residents in 2011. This means an increase of 89% during that time and at an average annual growth rate of approximately 3%.

A population and housing study conducted by the RDN in 2007 estimated a 2006 population of 144,317 residents and used this as the basis to calculate future population growth. The study forecasts a population increase of 60 percent from 144,317 residents in 2006 to 231,184 residents by 2036 (BC Statistics, www.bcstats.gov.bc.ca, Urban Futures, 2007).

The study forecasts that the region will "grow at a slowing annual rate from roughly two percent today (2007) to just under one percent by 2036" compared to the three to five percent growth rates in previous decades. Since this study was done, the Regional District of Nanaimo has experienced lower growth than anticipated with 138,631 residents in the 2006 Census and 146,574 residents in 2011 compared to the predicted population of 158,767. Based on the forecast study and the 2011 Census results, it is anticipated that the Region's population will increase at a slower rate over the next two decades while at the same time growing older.

The Region's population has aged significantly since 1986 with the majority of the population now over the age of 45. Between 2006 and 2011 the median age of the Region's population increased from 46.6 to 49.3. It is predicted that the population will continue to grow older with significant implications for land use, housing, services and employment.

2.3 Housing

According to Statistics Canada's 2006 Census data, there were 59,875 homes (occupied dwellings) in the Regional District of Nanaimo in 2006.[3] Table 2-1 provides shows the percentage of each type of housing.

Table 2-1 Housing in the Regional District of Nanaimo

Housing Type	% of homes in the RDN
Single-detached houses	68%
Semi-detached houses	4%
Row houses	4%
Apartments, duplex	5%
Apartments in buildings with fewer than five storeys	13%
Apartments in buildings with five or more storeys	2%
Other dwellings	4%

Source: Statistics Canada. 2006 Community Profiles.

[3] Statistics Canada. 2006 Community Profile for Regional District of Nanaimo

3 Characterization of the RDN's Solid Waste Stream

This section provides information on the quantity and characteristics of discarded materials that are collected for recycling, composting and landfilling. The disposal data is further assessed to provide an understanding of the types of materials (paper, metal, organics, etc.) that currently compose the waste being landfilled and which sectors are contributing to the waste.

3.1 Waste Generation Data

The per capita disposal (landfilled) rate for the RDN in 2012 was 347 kg per year. Figure 3-1 shows the variation in the RDN per capita disposal rate from 1992 to 2012, showing a reduction trend in the amount of waste disposed, with the exception of 2004-2008 (during the housing boom).

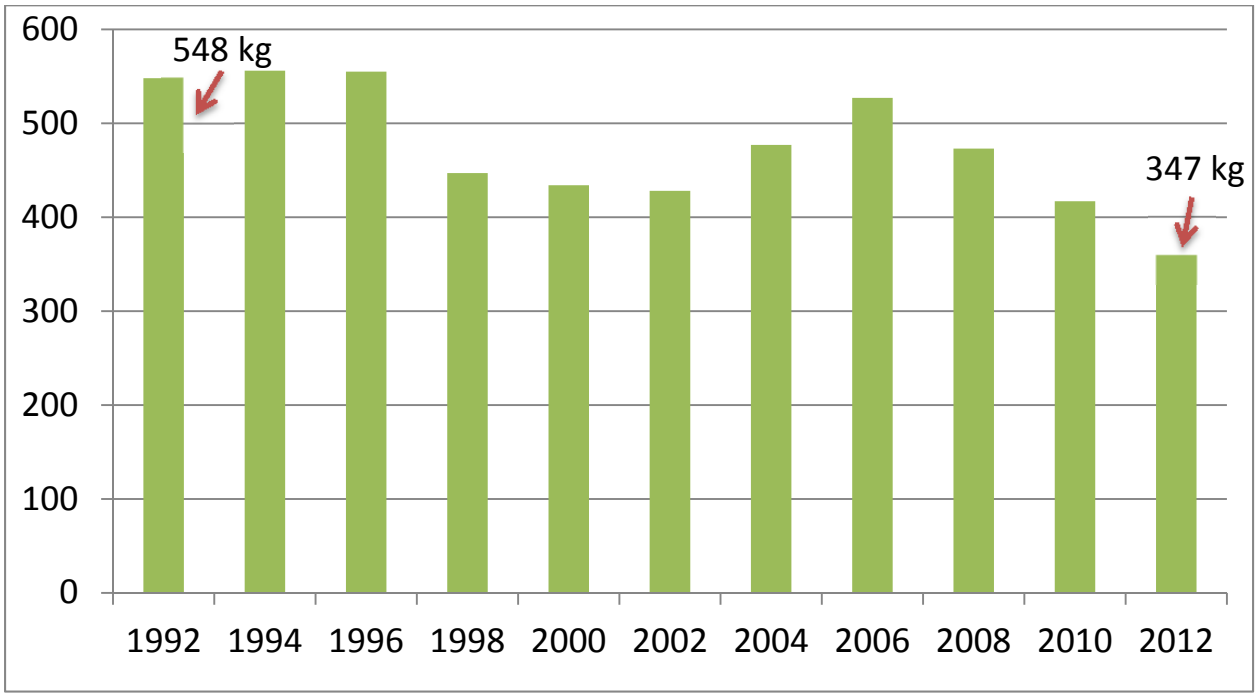


Figure 3-1 1992 – 2012 RDN Disposal Rate (kg/capita)

Disposal data collated by the BC Ministry of Environment for 2010[4] indicates that the RDN has one of the lowest disposal rates in BC (the RDN's disposal rate in 2010 was 410 kg/capita). Figure 3-2 shows how the RDN compared to other BC regional districts in 2010.

[4] At the time of writing this report (May 2013), this data is draft.

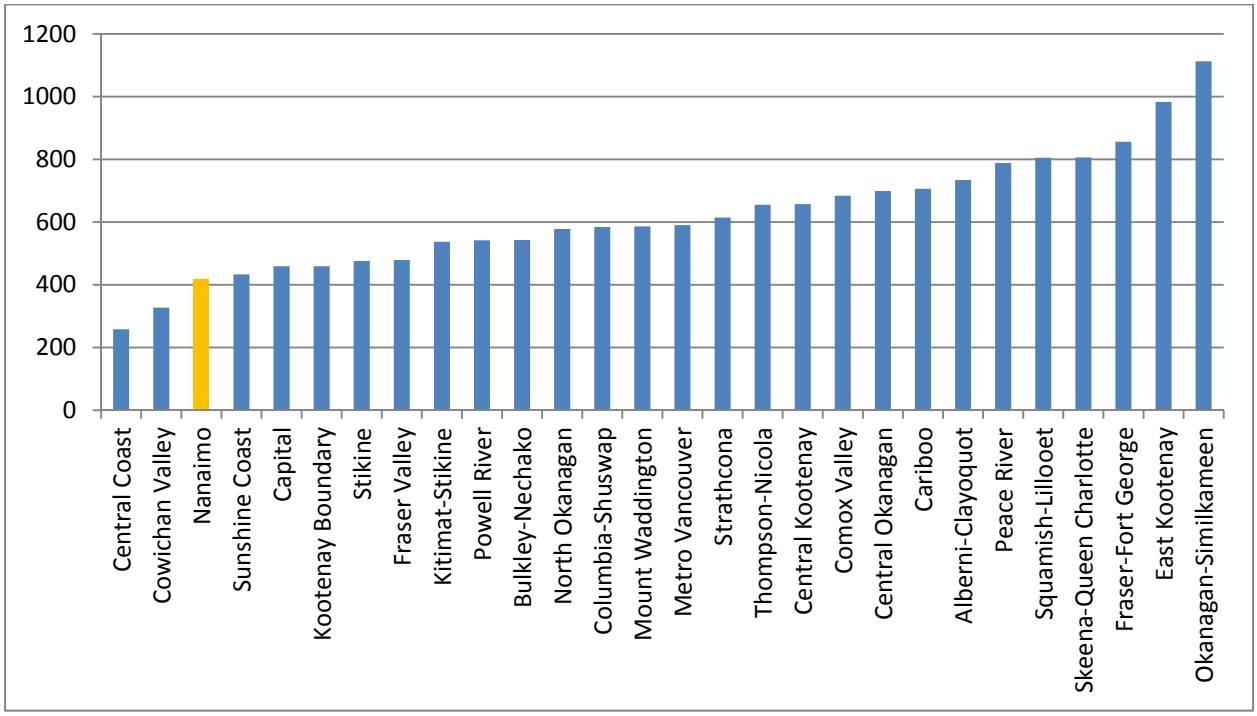


Figure 3-2 Disposal Rates (kg/capita/year) for BC Regional Districts (2010)

"Waste generation" refers to the total amount of solid waste discarded in the RDN, which is the sum of waste recycled, composted and landfilled. Table 3-1 also shows the "diversion rate", which is the amount of waste *diverted* to recycling or composting relative to the amount of waste *generated*. Table 3-1 provides disposal, diversion and waste generation data from 1998 to 2012. In 2012, the RDN disposed 52,516 tonnes of garbage and diverted 112,853 tonnes to recycling, composting and extended producer responsibility programs, thereby achieving a diversion rate of 68%.

Table 3-1 Disposal and Diversion (1998 – 2012)

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Disposal															
Municipal solid waste	51,041	50,382	48,995	52,154	51,778	57165	62484	68824	66444	71930	67,959	61,834	60,890	54,815	52,460
Construction/demo [1]	6,815	8,237	6,552	5,258	4,853	4257	5307	7692	6515	6624	2,110	1,284	519	129	56
Total Disposal	**57,856**	**58,619**	**55,547**	**57,412**	**56,631**	**61,422**	**67,791**	**76,516**	**72,959**	**78,554**	**70,069**	**63,118**	**61,409**	**54,944**	**52,516**
Diversion[2]															
Cardboard & Boxboard	detailed data unavailable										20,011	20,416	17,536	17,718	15,106
Commingled loads														15,733	16,951
Mixed Paper											842	1,367	2,604	916	2,429
Newspaper											13,930	13,400	5,932	4,703	1,822
Glass											1,545	2,453	732	750	1,014
Plastic											2,097	2,200	2,395	1,327	1,485
Scrap Metal [5]											9,467	8,432	8,893	8,601	7,871
Asphalt Shingles											4,130	2,924	2,063	2,611	1,465
CD/Wood Waste[4]											23,500	20,189	16,348	16,137	14,898
Wood Waste (Landfill cover)											1,000	1,000	1,000	550	1,105
Food Waste											3,472	3,408	4,117	7,761	9763
Yard Waste											12,478	12,757	11,098	12,089	11,382
Landclearing											5,629	2,993	17,295	11434	10,222
Gypsum											3,400	2,924	3,272	2,190	2,268
Textiles														1,681	1,520
Stewardship programs[6]											450	638	7,800	7,000	9,552
Subtotal of Recycling	**38,362**	**36,526**	**49,995**	**55,265**	**51,972**	**58,318**	**62,762**	**64,448**	**71,801**	**99,078**	**101,951**	**95,101**	**101,085**	**111,201**	**108,853**
Backyard composting	5,400	7,700	7,400	3,700	4,500	4900	4700	4500	4000	3500	3,200	3,200	3200	4,000	4000
Total Diversion	**43,738**	**44,244**	**57,385**	**63,394**	**60,681**	**63,218**	**67,462**	**68,948**	**75,801**	**102,578**	**105,151**	**98,301**	**104,285**	**115,201**	**112,853**
Total Generated (Disposed + Recycled)	**101,594**	**102,863**	**112,932**	**120,806**	**117,312**	**124,640**	**135,253**	**145,464**	**148,760**	**181,132**	**175,220**	**161,419**	**165,694**	**170,145**	**165,369**
Diversion Rate	**43%**	**43%**	**51%**	**52%**	**52%**	**51%**	**50%**	**47%**	**51%**	**57%**	**60%**	**61%**	**63%**	**68%**	**68%**
Population	**128,912**	**129,062**	**129,069**	**129,828**	**131,322**	**133,502**	**135,099**	**138,248**	**141,246**	**143,020**	**145,870**	**148,042**	**149,665**	**150,635**	**151,508**
kg/capita disposal	449	454	430	442	431	460	502	553	517	549	480	426	410	365	347
kg/capita diversion	339	343	445	488	462	474	499	499	537	717	721	664	697	765	745
kg/capita generation	788	797	875	931	893	934	1001	1052	1053	1266	1201	1090	1107	1130	1091

Note: Data reported by RDN staff. Population data does not match with data provided in Section 2.2.

3.1 Trends in Waste Generation

Figure 3-3 shows waste generation data from 1992 to 2012 and Figure 3-4 shows the change in per capita waste disposal from 1998 to 2012. Both show a trend towards increased waste diversion as a percentage of overall waste generated.

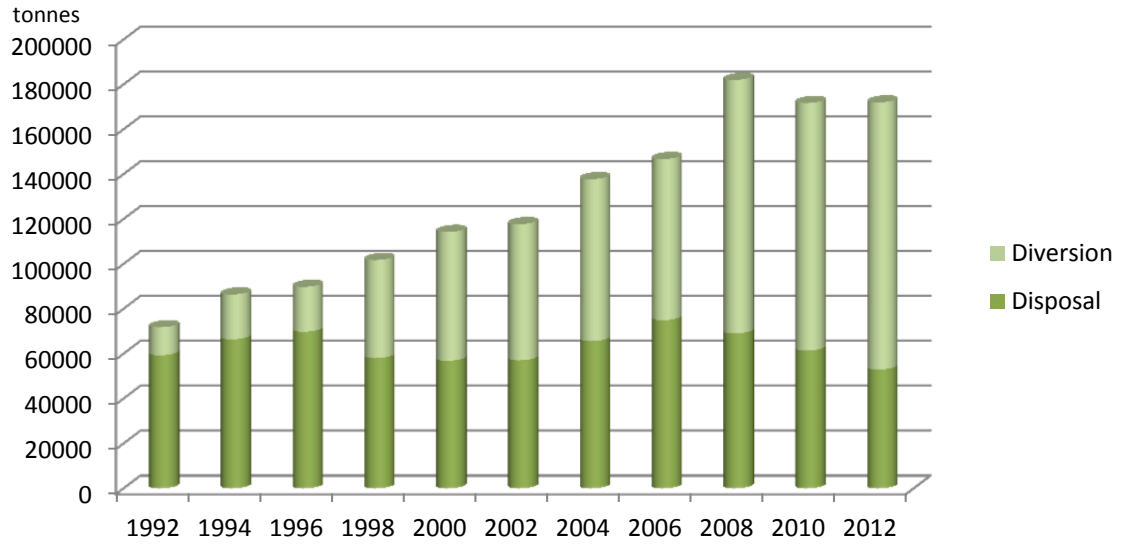


Figure 3-3 Total Waste Generation (1992 – 2012)

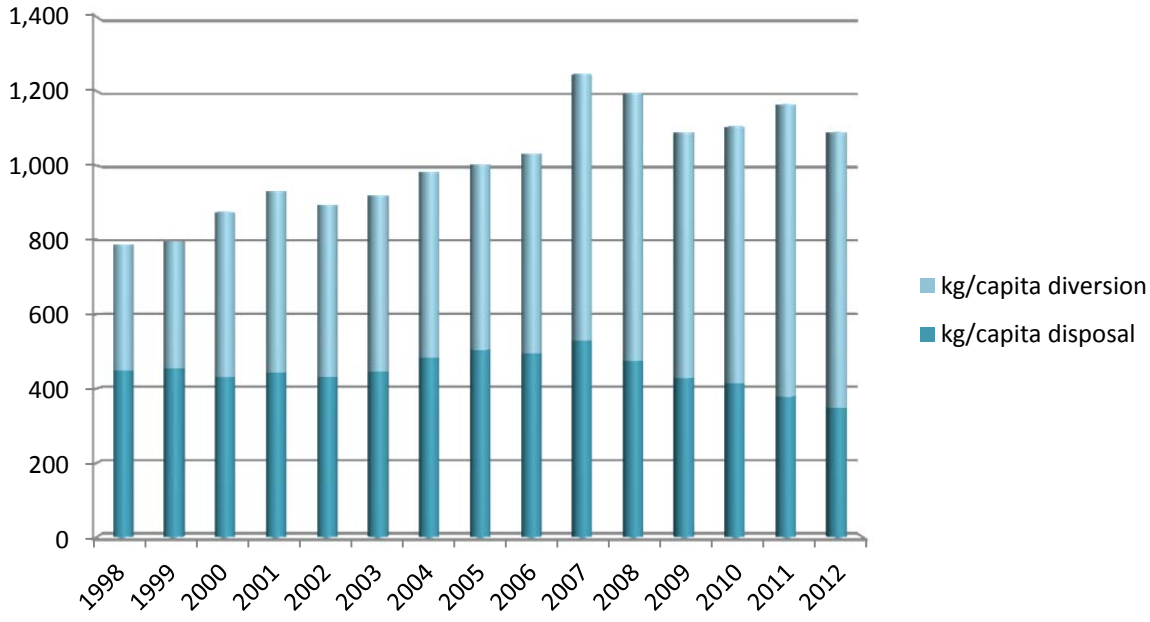


Figure 3-4 Per Capita Waste Generation (1998-2012)

3.2 Sources of Disposed Waste

Based upon scale house data collected at the RDN's disposal facilities (the Church Road Transfer Station and the Regional Landfill), an estimate of the sources of the waste sent to disposal was developed and is provided in Table 3-2.

Table 3-2 Sources of Waste Disposed in the RDN

Waste Source Type	Tonnes (2012)	% of waste disposed
Curbside residential waste	8,928	17%
Multi-family residential waste (estimated)	2,626	5%
Commercial waste	29,934	57%
Self-hauled waste	11,028	21%
Totals	**52,897**	**100%**

The quantity of waste (garbage) allocated to "curbside residential waste collection" is based on the garbage collected by municipal and RDN curbside garbage collection programs. The "commercial waste collection" refers to garbage delivered by private waste collection companies and includes garbage generated by businesses and institutions (schools, hospitals, care facilities). Multi-family residential waste refers to garbage generated by apartments and condominiums, which are not included in the curbside garbage collection programs. "Self-hauled waste" refers to garbage that was delivered to the RDN's disposal facilities in vehicles other than commercial waste collection trucks, including cars, vans and pickup trucks operated by residents and small businesses.

3.3 Composition of Disposed Waste

In 2012, the RDN conducted a waste composition study to determine what types of waste materials are being landfilled and in what proportion. The results of this study are shown in Figure 3-5, which provides the estimated composition of the solid waste landfilled in the Regional District of Nanaimo. The study data indicates that the largest components of the waste landfilled in the RDN are: compostable organics (35%), plastic (14%), paper products (13%), building materials (11%), and household hygiene (7%). A more detailed breakdown of the waste composition data can be found in Appendix A.

The composition of the waste disposed can also be viewed in terms of what materials have alternative methods of management available, including recycling, composting or EPR programs. Figure 3-6 shows that roughly 63% of the waste landfilled has an alternative waste management method available.

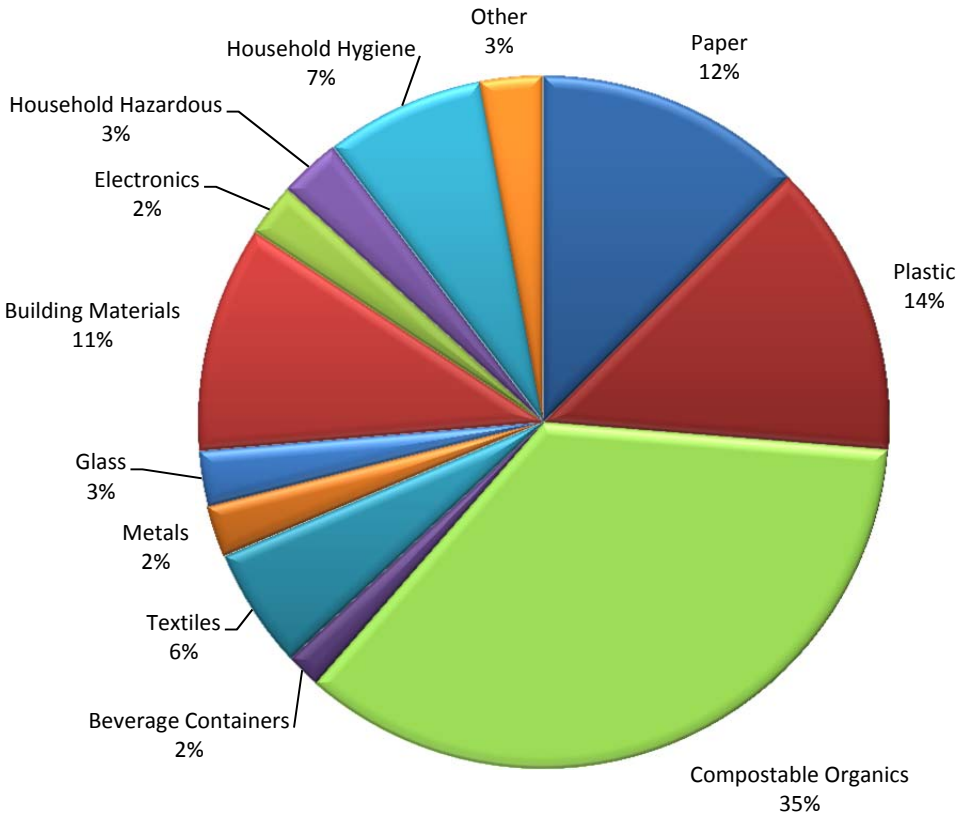


Figure 3-5 Composition of Waste Disposed, by Material (2012 data)

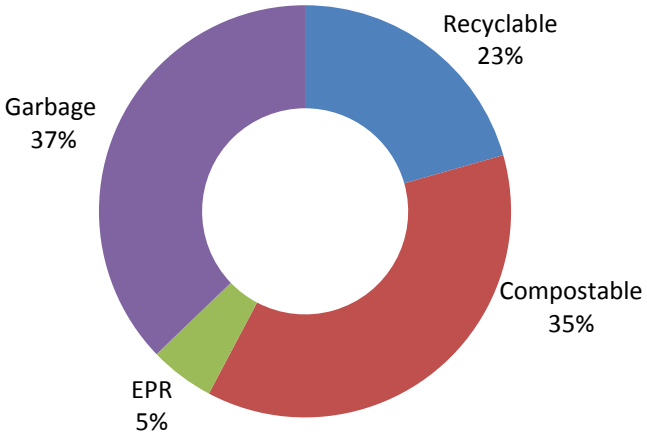


Figure 3-6 Composition of Waste Disposed, by Waste Management Alternative (2012 data)

3.3.1 Comparison of 2004 and 2012 Waste Composition

Figure 3-7 presents a comparison between the findings from the 2004 and the 2012 waste composition studies. The data is presented using kilograms per capita to provide an indication of which waste materials appear to be increasing in the waste stream, and which appears to be decreasing. The most notable change is in compostable organics, which decreased 31% from approximately 178 kg/capita in 2004 to 122 kg/capita in 2012. Metals disposed decreased 71% from 29 kg/capita to 8.5 kg/capita in 2012. Disposal of building materials also decreased from 47 kg/capita to 38 kg/capita. In contrast, household hygiene (primarily diapers) is estimated to have increased from approximately 10 kg/capita in 2004 to 26 kg/capita in 2012. Electronics disposed increased from roughly 3 kg/capita to almost 9 kg/capita in 2012.

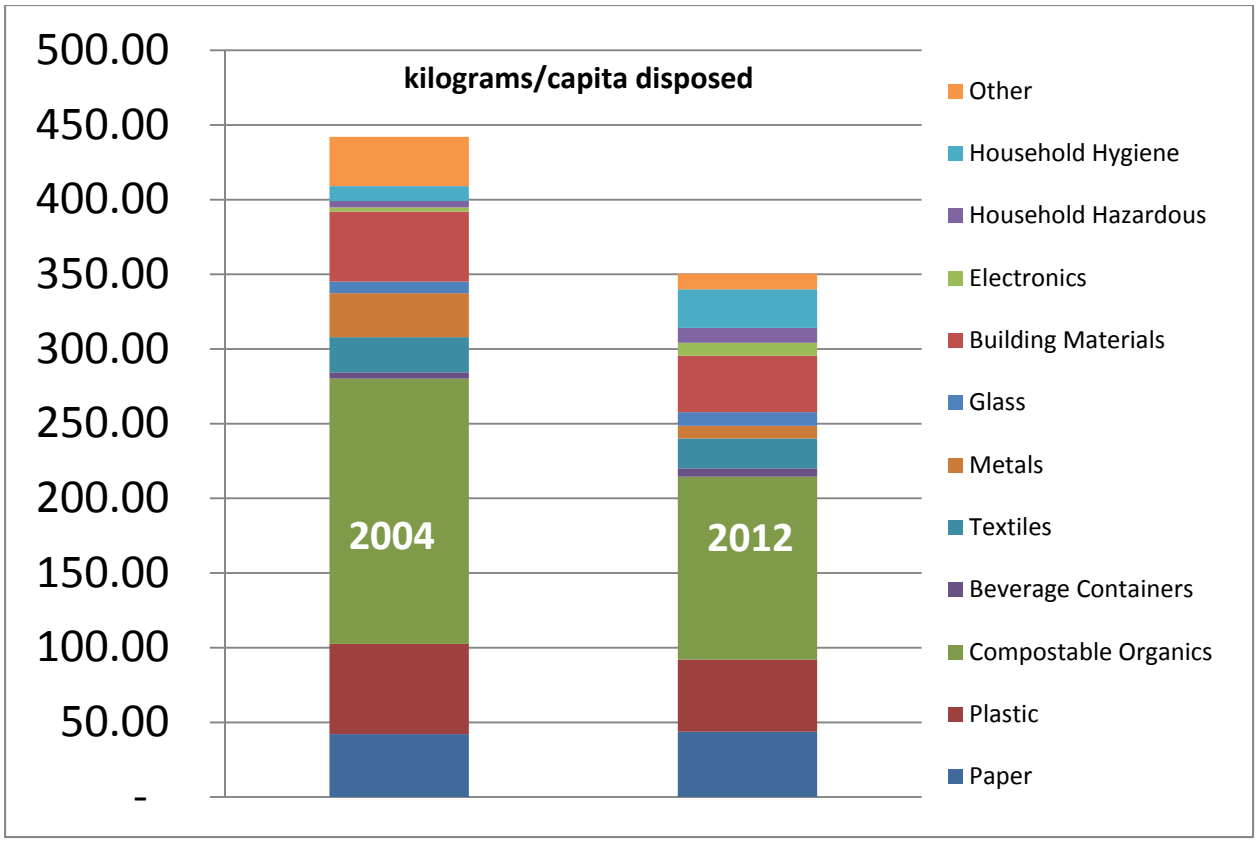


Figure 3-7 Comparison of 2004 to 2012 Waste Composition

4 Overview of Existing Waste Management System

This section provides a high-level overview of the system to manage solid waste in the RDN. There are many actors within the system providing a wide array of services. Figure 4-1 is a schematic diagram showing the breadth of activities and actors engaged with the current solid waste management system. There are a wide range of waste management activities underway that reflect both a relatively mature waste management system and significant economic activity based on secondary resources.

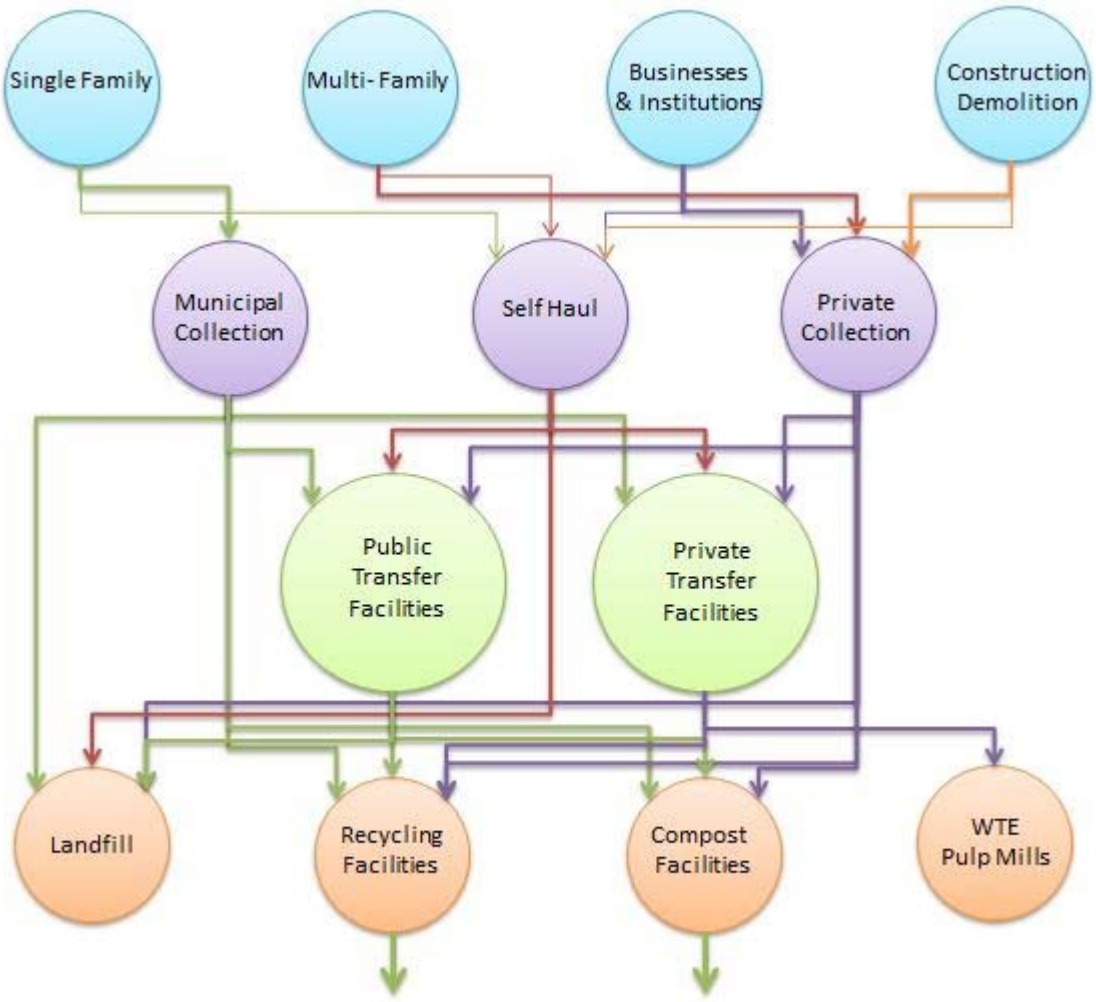


Figure 4-1 Components of the Waste Management System in the RDN

4.1 Key Facilities

The waste management system is reliant on a range of activities that deliver discarded materials to waste management facilities. These facilities include:

- The RDN's Church Road Transfer Station;
- Licensed private transfer stations;
- Licensed private and non-profit recycling and composting facilities; and
- The RDN's Regional Landfill site.

These facilities are mapped on Figure 4-2 and described in sections 12 through 17. There are many other smaller facilities that contribute to the solid waste management system, including bottle depots and other businesses and non-profits involved in providing EPR (extended producer responsibility) services. A list of all solid waste facilities and the materials managed at each facility is provided as Appendix B.

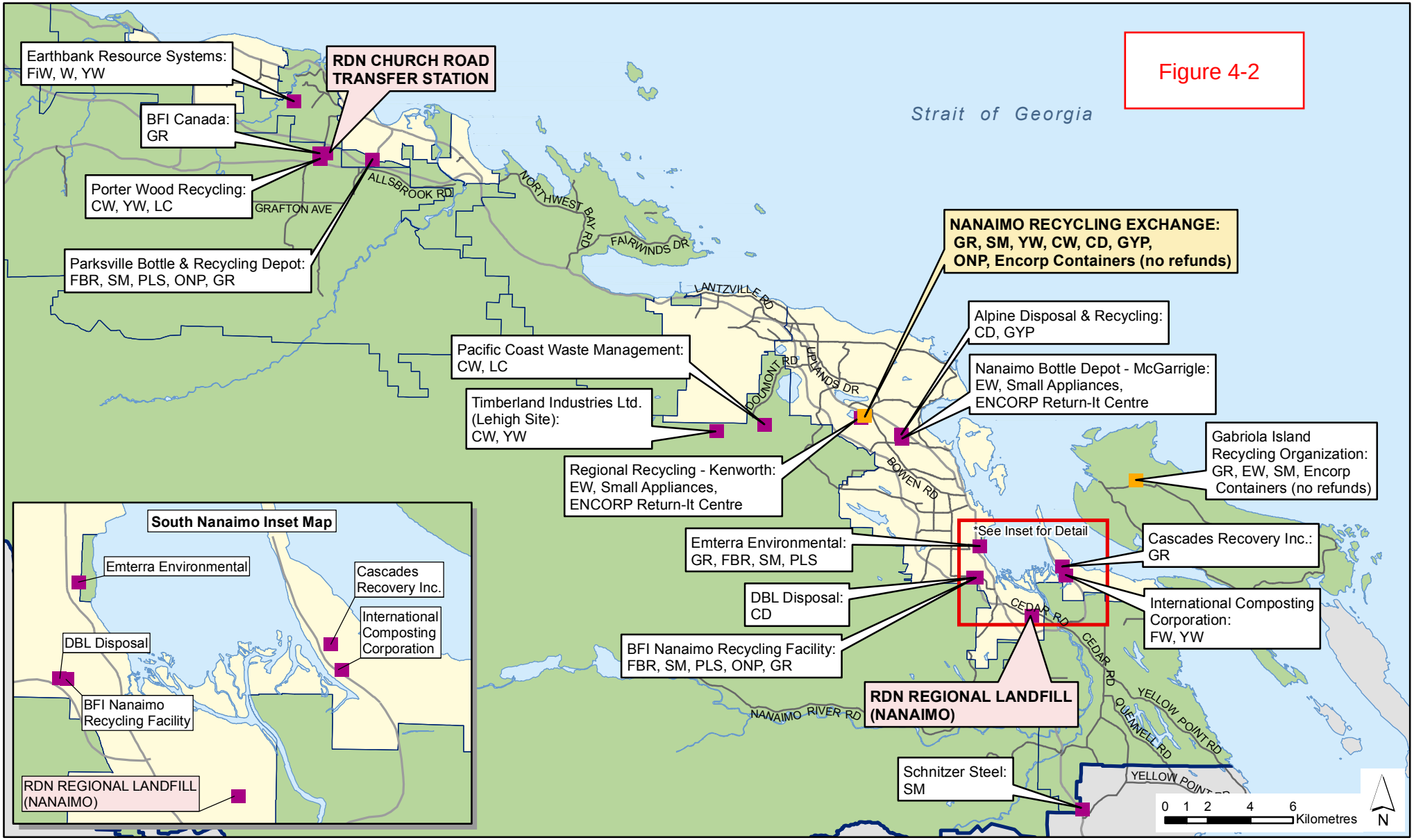
4.2 Policy Framework

The RDN's waste management system is being driven by a number of foundational policies:

- The adoption of "zero waste" as the waste diversion target – meaning that the RDN will continuously strive to reduce the amount of waste requiring disposal;
- Ensuring that the Regional Landfill is designed and operated to maximize environmental protection and that the cost of this facility be reflected in the tipping fees charged. (The relatively high tipping fees in the RDN encourage the establishment of recycling and composting businesses);
- The RDN's policy of banning materials from disposal as garbage once a stable, alternative use is identified;
- An organics diversion strategy that set the right conditions for the private sector to invest in food waste composting and collection services (see Section 4.3);
- A construction/demolition waste strategy to drive the development of a recycling industry for waste from construction and demolition activities; and
- A waste stream facility licensing system that ensures that private waste management facilities operate at a high standard.

A description of the Regional Landfill design and operation are provided in Section 16.2. The other three foundational policies are described below, in sections 4.1, 4.2 and 4.3. Other solid waste policies, activities and infrastructure are described in Sections 5 through 18.

Figure 4-2



RDN Solid Waste & Recycling Facilities

Legend

Licenced | Application in Process | Highway | Electoral Area | Municipality | RDN Boundary

Materials

General Recycling (Blue Box Materials, Re-used Items)	GR	Scrap Metal	SM	Construction Demolition	CW	Gypsum	GYP
News Print	ONP	Fibre	FBR	Food Waste	FW	Biosolids	BS
Plastics	PLS	Land Clearing	LC	Yard Waste	YW	E Waste	EW
		Clean Wood	CW	Asphalt Shingles	ASHG	Fish Waste	FW

4.3 Organics Diversion Strategy

A cornerstone of the RDN's 2004 solid waste management plan was the diversion of organic waste from landfilling. In 2004, organic waste represented 50 % of the RDN's residential waste stream by weight and 40% of the ICI waste stream; therefore a focus on the diversion of organics was determined to be the single most effective means of increasing diversion of waste from landfilling.

The 2004 waste composition study indicated that the diversion of yard waste through drop-off depots was effective, so the organics diversion strategy focused on the diversion of food waste. The strategy targeted ICI food waste and residential food waste separately.

The Organics Diversion Strategy targeted both commercial and residential food waste diversion. The diversion of ICI-generated food waste was the first priority because of the large volumes generated at a relatively small number of locations (compared to residential organics). The RDN committed to banning ICI food waste from disposal in the landfill as long as a local alternative was available. With the development of a private in-vessel composting facility that could manage ICI food waste in the region, the RDN banned commercial food waste in 2005.

The next priority, residential food waste diversion, required a multi-stepped approach:

1. An initial assessment of residential organics diversion programs in other jurisdictions (completed in 2005);

2. Based on the successes experienced in other jurisdictions, a residential food waste collection pilot project ran from October 2007 to October 2008; and

3. Based on the success of the pilot project, both in terms of diversion and community acceptance, a full-scale residential food waste collection program was implemented in 2011.

4.4 Construction/Demolition Waste Strategy

In February 2007 the Regional Board approved a Construction/Demolition (CD) Waste Strategy. Key initiatives in the strategy include:

- Increasing the tipping fee for clean wood waste at RDN Solid Waste Facilities to create incentives to divert this material to licensed recycling facilities;

- A ban on disposal of clean wood waste in the Regional Landfill and roll-off containers of wood waste at RDN Solid Waste Facilities; and
- Arranging contracts with third party wood waste recycling facilities to manage wood waste received at the landfill and transfer station from small self-haulers.
- Effective January 1, 2008, the RDN banned clean wood waste from disposal in the Regional Landfill and roll-off containers of wood waste at RDN Solid Waste Facilities.

As a result of the strategy there are currently several CD waste management facilities in RDN and clean wood waste is no longer buried as garbage in the regional landfill. Additional information on CD waste management and a list of CD waste recycling facilities can be found in Section 15.

4.5 Waste Stream Management Licensing Bylaw

RDN Bylaw 1386 requires most solid waste management facilities operating in the RDN to maintain a Waste Stream Management License (WSML)[5]. A similar bylaw is in place in the Cowichan Valley Regional District. The authority to license and regulate solid waste facilities is given to regional districts through BC's Environmental Management Act and the RDN's licensing bylaw was enacted under the 2004 Solid Waste Management Plan.

The RDN's licensing bylaw (Bylaw # 1386) was established to fulfill the following objectives:

1. Create a high standard of operation for waste management facilities located in the RDN.
2. Encourage and protect legitimate waste management operations within the RDN.
3. Establish a reporting system for the flow of waste materials within the RDN to assist in tracking our waste reduction rate.
4. Protect and enhance the waste reduction rate achieved in both regional districts.
5. To provide a level playing field in the two regional districts.

All facilities that handle municipal solid waste (MSW) in whole or part are included in the licensing system: with the exception of those facilities noted under "exclusions" below. This means that transfer stations, recycling depots, composting facilities, material recovery facilities and brokers are subject to the licensing system. Facilities that are excluded from obtaining a license are:

- disposal facilities such as landfill and incinerators (because these facilities are regulated by the Province);
- soil facilities;
- stewardship program depots;
- concrete and asphalt recycling operations and auto wreckers; and
- municipally owned facilities.

Currently there are 12 waste stream management licenses in place in the RDN and 2 applications under review. A list of currently licensed facilities and facilities currently undergoing application review is provided in the Table 4-1.

[5] The WSML bylaw can be found at http://www.rdn.bc.ca/cms/wpattachments/wpID224atID652.pdf.

Table 4-1 RDN Waste Stream Management License Holders

Waste Stream Management License Holders (as of April 2013)
1. Schnitzer Steel Pacific
2. Parksville Bottle & Recycling Depot
3. International Composting Corporation
4. BFI Nanaimo Recycling Facility
5. Emterra Environmental
6. Earthbank Resource Systems
7. Alpine Disposal & Recycling (ADR)
8. Pacific Coast Waste Management (PCWM)
9. Porter Wood Recycling Ltd.
10. DBL Disposal Service Ltd.
11. BFI Canada, Springhill
12. Cascades Recovery Inc.
Waste Stream Management Applications Under Review (as of April 2013)
13. Gabriola Island Recycling Organization
14. Nanaimo Recycling Exchange

4.6 Disposal Bans

The practice of banning the disposal of specific wastes from the landfill, when viable recycling alternatives are in place, has been used by the RDN since 1991. Current landfill bans on recyclable/compostable materials include drywall (implemented in 1991), cardboard (1992), paper, metal and tires (1998), commercial food waste (2005), yard and garden waste (2007) wood waste (2007) and EPR materials designated under BC's recycling regulation (2007), household plastic containers (2009) and metal food and beverage containers (2009). Disposal bans are considered to be a critical policy mechanism to drive diversion activities, particularly in the ICI and construction/demolition sectors.

Table 4-2 provides a detailed list of materials currently banned from disposal at the Regional Landfill and the Church Road Transfer Station.

Table 4-2 "Prohibited Waste" at RDN Solid Waste Disposal Facilities

At the Regional Landfill	At Church Road Transfer Station
• Biomedical Waste • Commercial Organic Waste • Concrete or asphalt pieces, or rocks greater than 0.03m^3 or 70 kg • Corrugated Cardboard • Drums • Garden Waste • Gypsum • Hazardous Waste • Ignitable Wastes • Land Clearing Waste • Liquids • Metal • Motor vehicle bodies and farm implements • Municipal Solid Waste that is on fire or smouldering • Radioactive Waste • Reactive Wastes • Recyclable Paper • Stewardship Materials • Special waste, as defined in the Special Waste Regulation (British Columbia) except asbestos • Tires • Wood Waste	• Same items as the Regional Landfill plus: o Controlled Waste

5 Reduction and Reuse Activities

Both the RDN and the City of Nanaimo encourage residents to "reduce and reuse."

Both organizations promote backyard composting through providing information on their websites on how to backyard compost and grasscycle. Since the mid-1990s, the RDN has sold roughly 16,000 low-cost backyard composters to residents. In recent years, the RDN has stopped distributing composters and instead encourages residents to build their own or purchase one from a local retailer. Backyard composting is believed to have a significant impact on reducing the waste that requires collection and subsequent management. A typical backyard composter is estimated to divert 250 kg per year. Assuming that only the RDN-distributed composters are being used, an estimated 4,000 tonnes of organic waste materials is being diverted each year.

The City of Nanaimo holds a reuse-focused event each spring called "Reuse Rendezvous." This event promotes reuse through a weekend long curbside swap meet for residents to put out items that they no longer want and that may be useful to others.

In addition to the Regional District's and City's reduction and reuse activities, there are several other organizations involved in reuse in the RDN, including several private and non-profit retailers and many on-line classified services such as Craigslist and UsedNanaimo.com that are actively involved in the sale and purchase of used goods.

6 Single Family Collection

All single-family homes in the RDN (approximately 53,500 homes) receive curbside collection of garbage, recyclables and kitchen scraps (food waste and compostable paper). Within the City of Nanaimo, the City's in-house staff collect garbage and kitchen scraps and a contractor collects the recyclables. In the RDN service area, all collection services are provided through a contractor, with the exception of garbage collection in the Town of Qualicum Beach, where garbage is collected by the Town.

Curbside garbage and recycling for all single-family homes has been in place since the early 1990s; the collection of kitchen scraps was fully implemented by 2011. Figure 6-1 and Table 6-1 show the proportion of household discards that are being collected as garbage, recycling and kitchen scraps. In 2012, each household set out an average of 400 kg of discards, of which roughly 60% were diverted to recycling or composting. Figure 6-1 also shows that the total amount of single-family discards collected decreased by roughly 10% from 2006 to 2012.

Figure 6-1 Total Single-Family Discards 2006-2012

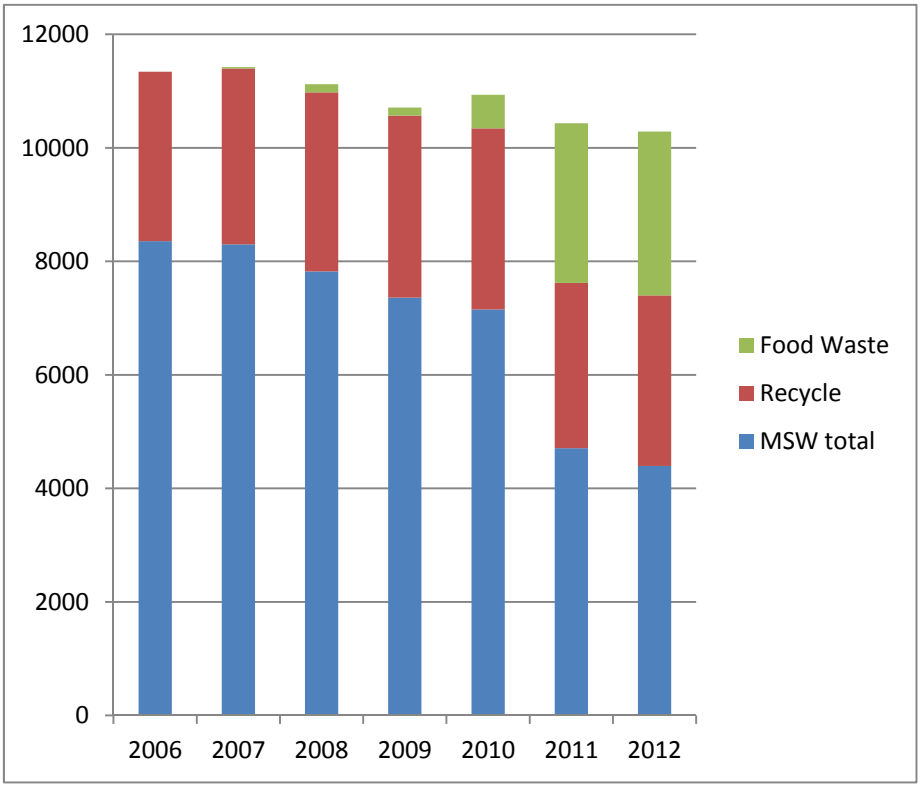


Table 6-1 2012 Single Family Discards: City of Nanaimo and RDN

	City of Nanaimo Curbside Collection	Regional District of Nanaimo Curbside Collection	Total Single Family Residential (tonnes)
Garbage (kg/home/year)	156	163	8,416
Recycling (kg/home/year)	132	111	6,749
Kitchen Scraps (kg/home/year)	132	107	6,247
Total (kg/home/year)	**420**	**381**	**21,412**
Diversion of Single-Family Discards to Recycling and Composting	**60%**	**57%**	**61%**

Figure 6-2 shows total discards on a per household basis. This diagram shows that the average amount that each household sets out at the curb (garbage + recycling + kitchen scraps) has been on the decline. This reduction is very positive from a zero waste goal perspective. This trend could be attributed to a slowing of economic activity in recent years, but may also be influenced by waste reduction initiatives happening locally, provincially and nationally.

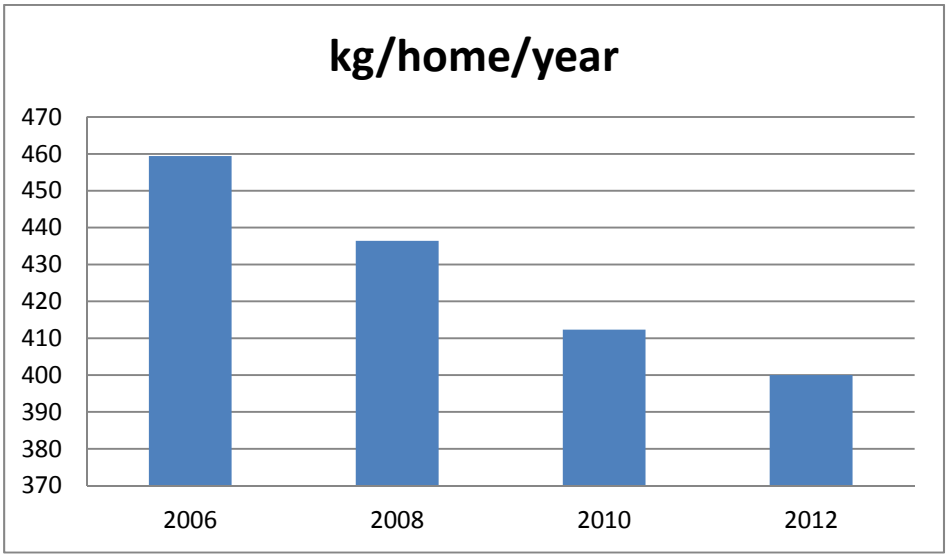


Figure 6-2 Single Family Waste Generation (Garbage + Blue Box +Green Bin)

The diversion rates achieved by the single-family curbside collection services are supported by:

- Limits on the amount of garbage that can be set out: The basic service each household receives provides for one container of garbage collected once every two weeks.[6] Tags for extra containers of garbage may be purchased by residents for $2 each. A maximum of two additional containers can be put out on the garbage collection day.
- Promotion and education: Each household receives a collection schedule calendar and a regular newsletter keeping them informed about the program, in addition to having information available on-line.
- Collection bans: The City of Nanaimo has banned recyclables and kitchen scraps from collection as garbage. Periodic inspections ensure compliance – garbage found to contain banned materials are not collected and an information notice is left with the garbage container.

Single-family residential waste disposal in 2012 was approximately 9,000 tonnes, about 17% of all of the waste landfilled. Figure 6-3 illustrates the estimated composition of the single-family residential sent to landfill. The composition data indicates that the five primary components of residential garbage are: compostable organics (36% of garbage), household hygiene (20%), plastic (14%), paper (7%) and textiles (6%). The compostable component was made up of food scraps (26%), compostable paper [7](8%) and yard waste (2%). Household hygiene consisted of diapers (15%) and pet waste (5%) and represents approximately 1,800 tonnes of disposed waste. The plastics category consisted of film packaging (5%) such as plastic bags, granola bar wrappers and plastic wrap, rigid containers such as shampoo bottles and yogurt tubs (3%), and durable plastics such as toys and plastic lawn chairs (2%).

Based on the waste composition of the garbage collected from single family homes, approximately 47% of residential waste sent to landfill could have been included in the recycling or kitchen scrap collection streams. An additional 3% could be diverted to existing EPR programs. This diversion potential is shown as a subset of Figure 6-3.

[6] In the RDN service area, 1 can = 100L. In the City of Nanaimo service area, 1 can = 70 L.
[7] Compostable paper refers to non-recyclable paper such as tissue, paper towels, and food-contaminated paper.

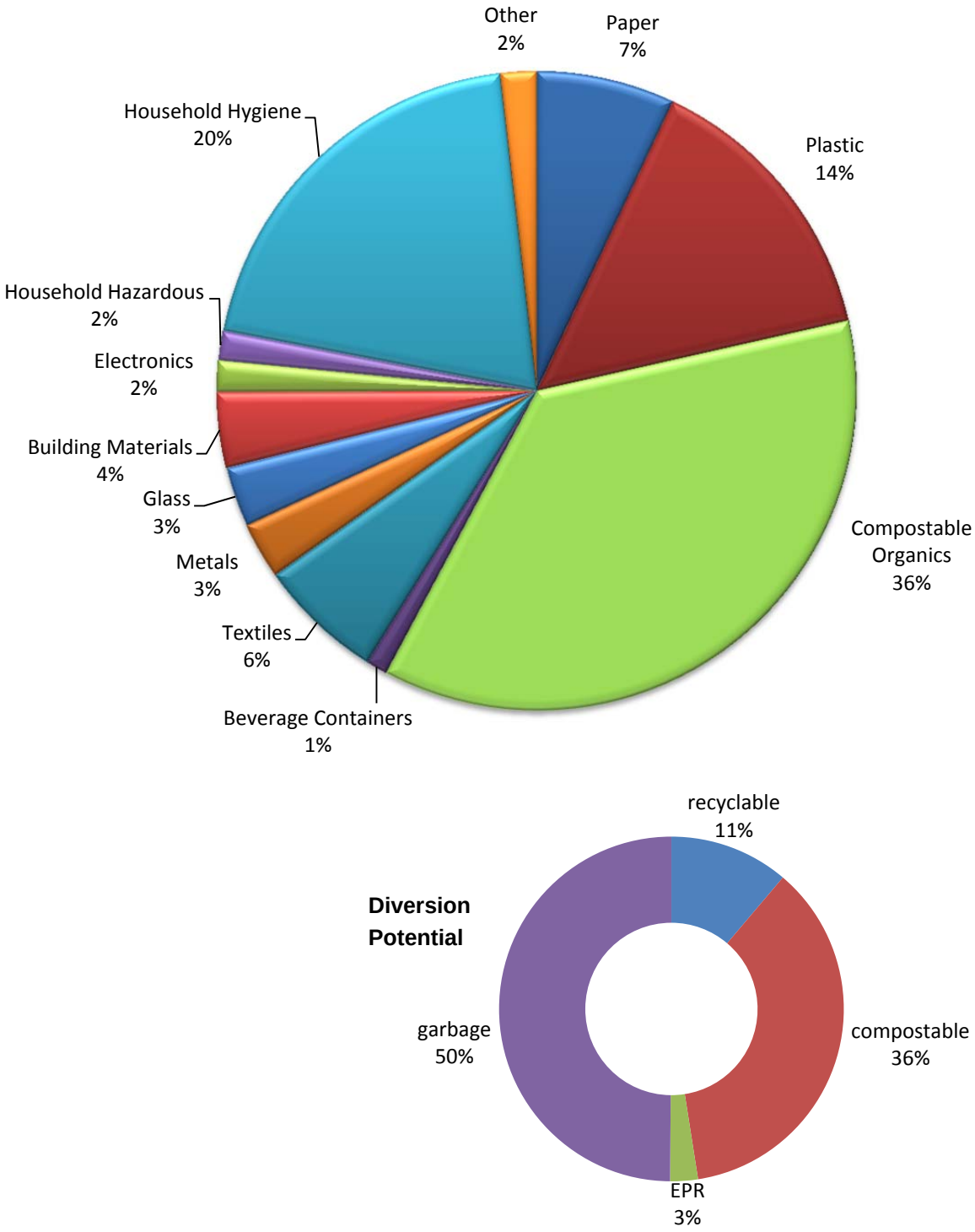


Figure 6-3 Estimated Composition Single-Family Garbage (2012)

7 Multi-Family Collection

There are 13,430 multi-family residential units in the RDN, with approximately 12,000 of these units located in the City of Nanaimo[8]. Collection services to multi-family buildings are privately managed in the RDN. Each building is responsible for hiring their collection services for garbage and recycling.

Since 2008, the RDN has had a Multi-family Diversion Strategy aimed at increasing the level of recycling activities available to multi-family residents living in townhouses, mobile homes, apartments and condominiums. In 2008, RDN staff estimated that 75% of multi-family buildings had recycling services on-site, but that those services were primarily for cardboard and paper collection. In 2012, the service levels were found to have significantly improved since 2008, with 94% of multi-family buildings reporting that they had recycling services for cardboard, paper and plastic and containers. The primary mechanism by which the RDN encourages recycling in multi-family buildings is their landfill bans that prohibit the landfilling of residential recyclables such as household plastic containers, recyclable paper, cardboard, and metal.

Because garbage and recyclables generated at multi-family buildings are generally collected by trucks servicing businesses and institutions, no data is available on the specific quantities disposed or recycled by the multi-family building sector. Research done in other jurisdictions has been used as the basis to estimate waste generation by the multi-family sector in the RDN, as shown in Table 7-1. The research indicates that recycling rates in multi-family buildings are typically much lower than those associated with single-family recycling programs. For example, Metro Vancouver reports that only 16% of waste from multi-family homes is recycled and the City of Toronto reports an 18% recycling rate. [9] Comparatively, single-family homes in the RDN recycle 30% of their discards through the curbside recycling program (not including kitchen scraps collection).

Table 7-1 Estimate of Waste Generation by the Multi-family Sector in the RDN

	Estimated tonnes for all Multi-Family Buildings (2012)	Estimated Kg Per Unit/Year (2012)
garbage	2,836	211
recycling	709	53
generation	**3,545**	**264**

The lower recycling rate in multi-family buildings is often attributed to:

- There is no restriction on how much garbage each residential unit can dispose of;

[8]Multi-Family Housing Diversion Strategy Progress Report; RDN staff memorandum by S. Horsburgh to C.McIver; February 2, 2012.

[9]http://www.metrovancouver.org/region/dialogues/Reports%20and%20Issue%20Summary%20Notes/Multi-FamilyWaste-NS-Summary20110419.pdf and http://www.toronto.ca/garbage/pdf/2010-graph.pdf

- There is no direct financial signals to each residential unit regarding how they manage their household waste; and
- There is limited or no opportunity to identify and communicate with residents that place recyclables in the garbage.

During the RDN's 2012 waste composition study, a load of garbage from multi-family buildings was sampled to provide a rough estimate of the composition of the waste being discarded by multi-family buildings. The data from this sampling exercise is provided in Figure 7-1. This composition data suggests that the majority of waste disposed as garbage in multi-family buildings is recyclable (26%) or compostable (44%).

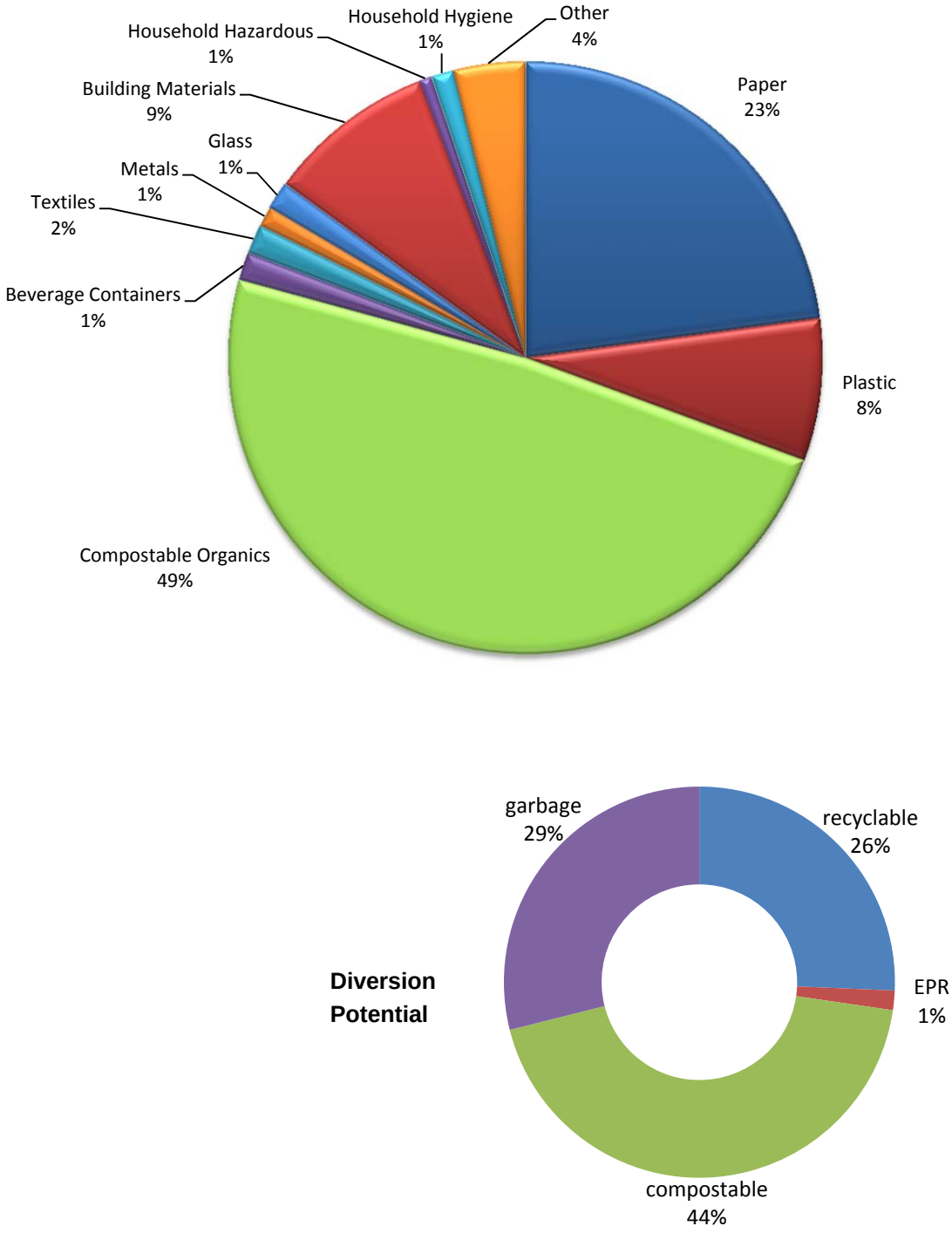


Figure 7-1 Estimated Composition of Multi-Family Garbage (2012)

8 Industrial, Commercial and Institutional Collection

Similar to multi-family residential buildings, collection services to industrial, commercial and institutional (ICI) properties are privately managed. Each business and institution is responsible for hiring their own collection services for garbage and recycling. The RDN encourages recycling by the ICI sector through their landfill bans which prohibit the landfilling of recyclables, food waste and yard waste.

Table 8-1 Estimated ICI Disposal and Diversion (2012)

ICI Disposal and Diversion	Estimated tonnes (2012)
Disposal	29,960
Diversion	84,974
Generation (disposal + diversion)	114,934
% Diversion	74%

In 2012, roughly 30,000 tonnes of ICI garbage was landfilled, approximately 57% of all of the waste landfilled. During the same period the ICI sector is estimated to have diverted roughly 85,000 tonnes of discarded materials to recycling and composting, giving the ICI sector an impressive diversion rate of 74%, as calculated in Table 8-1.

An assessment of the garbage disposed by the ICI sector was done as part of the RDN's 2012 waste composition study (Figure 8-1). The data estimates that approximately 42% of the garbage disposed is compostable, including food scraps (28%), yard waste (8%) and compostable paper products (6%). An estimated 16% is considered recyclable and consists primarily of paper and cardboard (12%), with metal, pallet wrap and drywall making up the remainder of the recyclable portion of the ICI garbage.

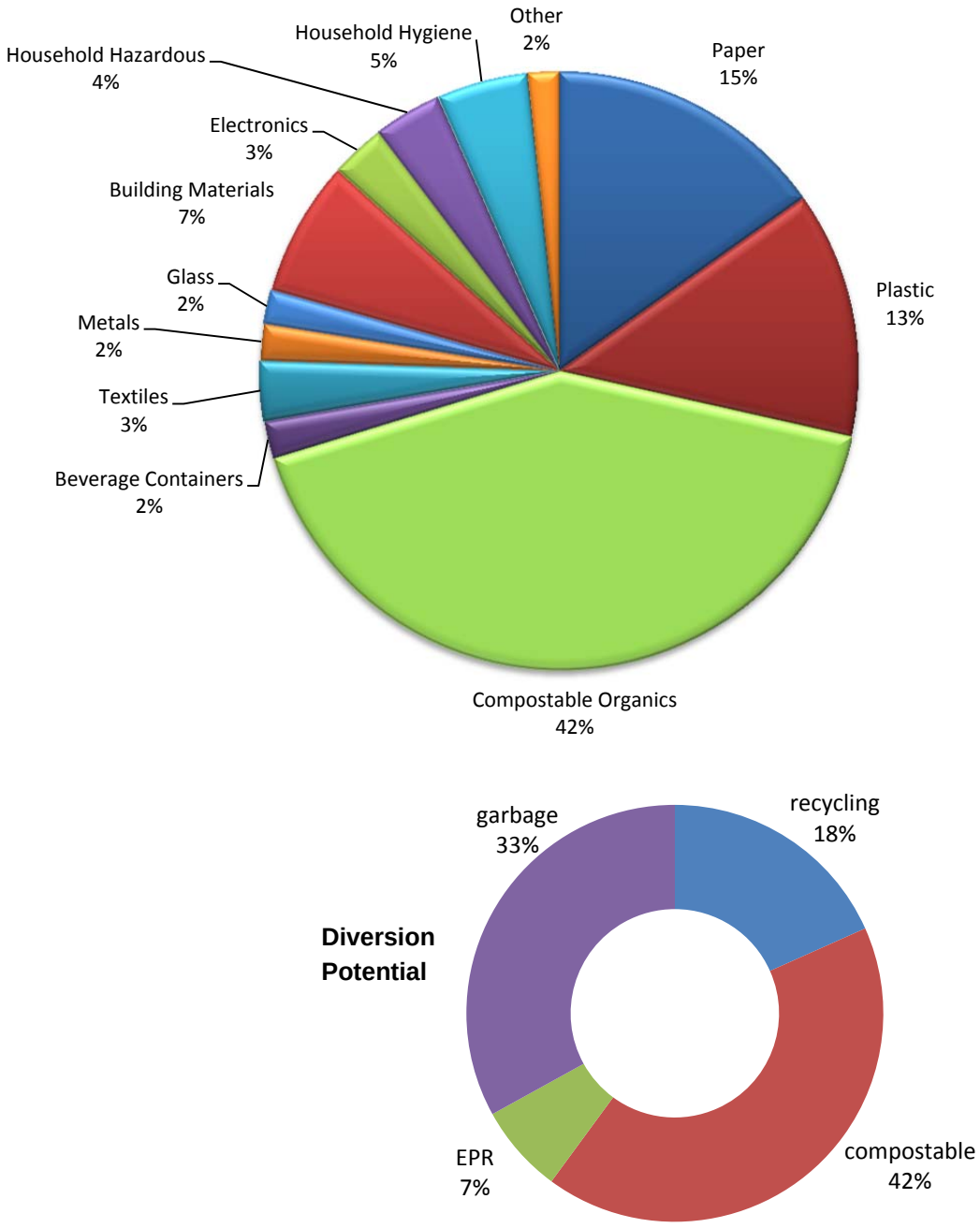


Figure 8-1 Estimated Composition of the ICI Sector Garbage (2012)

9 Yard Waste Collection

Yard waste such as leaves and grass clippings are not collected as part of residential waste collection services. Residents and businesses are encouraged to manage their yard waste in one of the following manners:

- Reduce the amount of yard waste through practices such as grasscycling and xeriscaping[10]
- Backyard or on-site composting
- Self-hauling to one of several yard waste depots in the RDN. Currently, depots are located at:
    - Church Road Transfer Station
    - DBL
    - Nanaimo Recycling Exchange
    - Pacific Coast Waste Management
    - Porter Wood Recycling
    - Regional Landfill
- Hiring a yard waste removal service
- Include yard waste removal in landscaping contracts.

Use of these yard waste management practices and services is encouraged by a variety of policies, including:

- A ban on yard waste disposed as garbage at the landfill site and transfer station
- A ban on the inclusion of yard waste in the City of Nanaimo's and RDN's residential garbage collection service
- Not providing yard waste collection as part of the single-family residential curbside service
- Promoting the yard waste management alternatives.

This approach to yard waste management has been successful at minimizing the amount of yard waste being landfilled. The 2012 waste composition study indicated that yard waste is roughly 2.5% of the residential waste sent to landfill and 5% of overall waste landfilled. The estimated disposal and diversion for yard waste is presented in Table 9-1 below.

Table 9-1 Estimated Yard Waste Disposal and Diversion (2012)

Yard Waste	Tonnes
Disposal	2,700
Diversion	11,300
Total Generation	14,000
Diversion rate	**81%**

[10] Xeriscaping is a form of landscaping using plant species that require minimal water and consequently generate less yard waste.

10 Collection Depots

Throughout the RDN there are public, private and non-profit depots used by residents and small businesses that accept recyclable materials, ranging from residential recyclables like paper to scrap metal to drywall. Use of these facilities is supported through:

- Disposal bans on recyclable materials
- High tipping fees for garbage
- Promotion through the RDN's on-line Recycling Directory.

The following are the main collection depots in the RDN. In addition to this list there are several businesses that accept one or more recyclable materials pertinent to their business, such as cell phone retailers that take back used cell phones and cell phone batteries.

- Nanaimo Recycling Exchange
- Gabriola Island Recycling Organization
- Schnitzer Steel Pacific
- Parksville Bottle & Recycling Depot
- RDN's Regional Landfill
- Progressive Waste Solutions (formerly BFI)
- Emterra Environmental
- DBL Disposal Service Ltd.
- RDN's Church Road Transfer Station
- Regional Recycling (2 locations)

11 Extended Producer Responsibility

In British Columbia, EPR (formerly referred to as Industry Product Stewardship) is an environmental policy approach in which the producer's responsibility for reducing environmental impact and managing the product is extended across the whole life cycle of the product, from selection of materials and design to its end-of-life[11]. In terms of solid waste management, EPR puts the onus of end-of-life product management on the producer and consumers of a product rather than the general taxpayer or local government.

EPR programs play an integral and increasingly significant role in the management of municipal solid waste in BC. Most existing EPR programs have been established by producers and brand owners of products in accordance with requirements set out in the BC Recycling Regulation. Other programs have been set up voluntarily by individual companies and industries (e.g. for milk containers). Table 11-1 lists the current regulated and voluntary EPR programs in BC. The term "stewardship organization" used in the table refers to the agency responsible for operating the EPR program on behalf of producers and brand owners.

Table 11-1 BC's EPR Programs[12]

Mandated EPR Programs			
Product Category	**Product Details**	**Stewardship Organization**	**Program Status**
Antifreeze and Oil	Antifreeze, used lubricating oil, filters and containers	BC Used Oil Management Association (BCUOMA)	Ongoing since 1992 (oil) and 2011 (antifreeze)
Batteries	Dry cell batteries under 5kg (rechargeable and non-rechargeable) and cell/mobile phones	Rechargeable Battery Recycling Corporation (RBRC)	Ongoing since 2010
Batteries - Lead Acid	All lead-acid batteries	Canadian Battery Association (CBA)	Ongoing (industry-led) since 2011
Beverage Containers	*Non-Alcohol* - soft drinks, juice, water and sports drinks *Alcohol* - wine, spirits, import beers/ coolers sold in non-refillable containers	Encorp Pacific (Canada)	Ongoing (industry-led) since 1994
Beverage Containers	Beer cans, standard brown beer bottles and certain clear refillable beer bottles	Brewers Distributor Ltd. (BDL)	Ongoing since 1997

[11] As defined by BC Ministry of Environment

[12] The information in this table was adapted from the B*.C. Product Stewardship Programs Summary* web page found on the Recycling Council of BC website. *(http://rcbc.bc.ca/education/product-stewardship/table)*

Mandated EPR Programs			
Product Category	**Product Details**	**Stewardship Organization**	**Program Status**
Cell Phones	Cell phones, smart phones, wireless PDAs, external aircards, pagers and accessories (chargers etc.)	Canadian Wireless Telecommunications Association (CWTA)	Ongoing since 2009
Electronics	Portable and non-portable electronics - see here for a full list of products accepted	Electronic Products Recycling Association (EPRA)	Ongoing since 2007 (Phase 1), 2010 (Phase 2) and 2012 (Phase 5)
Lamps and Fixtures	All residential-use lamps and fixtures - see here for a full list of products accepted	Product Care Association	Ongoing since 2010 (CFL, fluorescent tubes) and July 2012 (all lamps). ICI sources and ballasts will be added October 2012
Large Appliances	Major appliances designed for use in *homes* including refrigeration, laundry and cooking appliances	Major Appliance Recycling Roundtable (MARR)	Ongoing since August 2012
Outdoor Power Equipment (OPE)	Lawn tractor, and hand-held, walk behind and free-standing OPE	Outdoor Power Equipment Institute of Canada (OPEIC)	Ongoing since July 2012
Packaging and Printed Paper	Residential packaging and printed paper with text or graphics (news papers, flyers etc. with the exception of bound books)	Multi-Materials BC (MMBC)	Added to the Recycling Regulation in May 2011. Program to be operational in May 2014
Paint, Flammable Liquids, Solvents, Pesticides, Gasoline	Paint, fuels, solvents, pesticides	Product Care Association	Ongoing since 1994 (paint), 1997 (flammables) and 1998 (aerosols)
Pharmaceuticals	Prescription drugs, non-prescription medicine, mineral and vitamin supplements, throat lozenges	Post Consumer Pharmaceutical Stewardship Association (PCPSA)	Ongoing since 1997
Small Appliances and Electrical Power Tools	Portable electrical appliances and power tools designed for use in homes	Canadian Electrical Stewardship Association (CESA)	Ongoing since 2011 (small appliances) and July 2012 (electrical tools)
Smoke Alarms	Commercial and residential smoke and carbon monoxide alarms	Canadian Hardware and Housewares Manufacturers Association (CHHMA)	Ongoing since 2011
Smoke Alarms	Commercial and residential smoke and carbon monoxide alarms	First Alert Canada	Ongoing since 2011
Thermostats	Electromechanical (mercury containing) and electronic thermostats	Summerhill Impact	Ongoing since 2010
Tires - Automobile	Most passenger, commercial and agricultural equipment tires	Tire Stewardship BC (TSBC)	Ongoing (industry-led) since 2007
Toys	Electronic or electrical toys	Canadian Brandowner	Ongoing since August

Mandated EPR Programs			
Product Category	**Product Details**	**Stewardship Organization**	**Program Status**
		Residual Stewardship Corporation (CBRSC)	2012

Voluntary EPR Programs			
Product Category	**Product Details**	**Administration**	**Program Status**
Beverage Containers - Milk	Empty milk, cream, and milk substitute (soy, rice, almond, hemp) beverage containers.	Encorp Pacific (Canada)	Ongoing since 2007
Tires - Bicycle	All types of bike tires and tubes, with the exception of tubular tires	Tire Stewardship BC (TSBC)	Ongoing since 2011

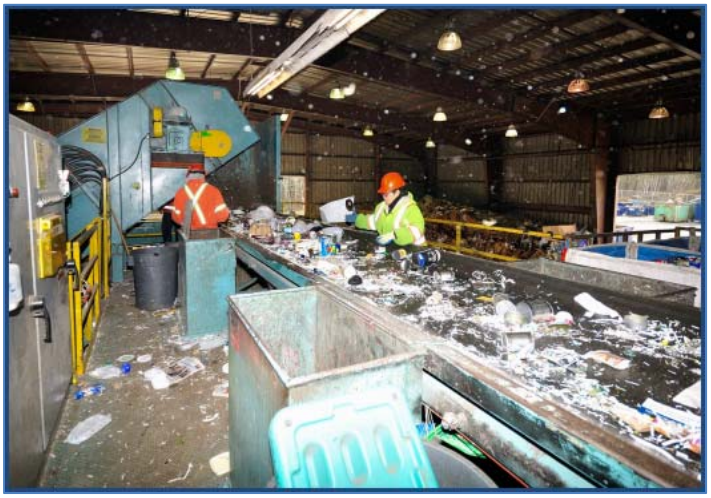
In the RDN, the current collection infrastructure for existing EPR programs consists of return-to-retail and take-back depots. The RDN's Recycling Directory can be used by residents to find the most convenient take back location for EPR products. The Recycling Council of BC operates a similar service through their toll-free Recycling Hotline (1-800-667-4321) and their on-line searchable database "Recyclopedia".

In accordance with the BC Recycling Regulation, the costs of collection and management of EPR programs are to be borne by producers and consumers, not by local governments or their tax payers. Many 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.

The latest addition to list of materials regulated under the Recycling Regulation is residential packaging and printed paper (PPP). This EPR program is scheduled to begin in May 2014. This particular EPR program is unique in that most homes in BC already have access to residential recycling services through curbside programs or depots. The impacts of this program on homes in the RDN are anticipated to be:

- A reduction in the cost of curbside collection services since the program will provide funding to the RDN and City of Nanaimo to off-set the cost of collecting PPP
- An increase in the types of packaging that can be recycled in the curbside collection program
- An increase in the types of packaging that can be recycled through recycling depots provided by the RDN, private companies and non-profit recycling organizations.

12 Processing of Recyclables



"Processing" refers to the receipt of recyclables from generators and then sorting and preparing those materials for the end-market use or subsequent processing. The RDN has 3 material recycling facilities (referred to as MRFs) that are owned and operated by private waste management companies: Progressive Waste, Emterra and Cascades. All 3 MRFs are located in the City of Nanaimo.

13 Organics Management

In the RDN there is reuse of leftover and excess food through food banks and other food redistribution services. Additionally some food scraps are picked up by area farmers for use as animal feed. However, the majority of organics are sent to centralized composting facilities. There are two licensed composting facilities in the RDN: International Composting Corporation (ICC) and Earthbank Resource Systems. The following table lists the types of materials each of these facilities manages:

International Composting Corporation	• Residential "green bin" kitchen scraps and soiled paper • Commercial food waste • Yard waste • Fish waste • Clean wood
Earthbank	• Farmed and wild fish offal • Farmed salmon mortalities • Ground up bark from the forestry industry • Ground up land clearing debris (exclusively local forest materials)

ICC is the only facility processing food waste in the RDN. This facility opened in Nanaimo in 2004 with a drum-style in-vessel composting system. The compost product is sold as a bulk product for blending into soil mixes. Recently, ICC modified the plant to convert organic waste into synthetic biofuel (biodiesel & jet fuel).

International Composting Corporation (ICC)

ICC Finished Compost Product

Earthbank operates an aerated static pile composting system near Parksville. They sell their finished compost product in bulk and in bags.

14 Education and Outreach

Both the RDN and the City of Nanaimo undertake promotion and education related to solid waste management.

The RDN:

- Has information related to the solid waste management planning, bylaws and zero waste programs on the Solid Waste and Recycling pages of the RDN's website (www.rdn.bc.ca).
- Distributes a "Zero Waste Beyond Composting" Newsletter three times per year to all homes receiving RDN curbside collection.
- Has a searchable on-line recycling directory for users to find out where they can bring their reusable, recyclable and compostable items.
- Has a zero waste school education program which provides free classroom workshops to schools throughout the RDN. This service has been contracted out to Nanaimo Recycling Exchange.

The City of Nanaimo:

- Distributes their "Waste Lines" newsletter to all City addresses in the spring and fall of each year.
- Has a dedicated web page on the City's website (www.nanaimo.ca) that includes information related to the City's residential collection services, a link to the RDN recycling directory, and a list of reuse and recycling organizations operating in the City.

15 Construction/Demolition Waste Management

Construction and demolition and renovation projects (CD) projects generate a wide range of materials, most of which are reusable or recyclable. These include concrete, asphalt, wood, gypsum wallboard, metal, cardboard, asphalt roofing and plastic.

The RDN promotes diversion of these materials through disposal bans on cardboard, gypsum (drywall), metal and wood, and high tipping fees on loads of CD waste arriving at the Regional Landfill (loads of CD waste cannot be delivered to the Church Road Transfer Station).

There are several facilities in the RDN that accept source-separated discarded CD materials for recycling, as listed in Table 15-1.

Table 15-1 Construction/Demolition Waste Management Operations in the RDN

Material	Facility Name
Asphalt	Haylock Bros. Hub City Paving
Asphalt Shingles	Pacific Coast Waste Management
Concrete	DBL Hub City Paving Haylock Bros. Mayco Mix Pacific Coast Waste Management Parksville Heavy Equipment
Metal	Alpine Annex Auto Bull Dog Auto Parts Carl's Metal Salvage DBL Nanaimo Recycling Exchange Porter Wood Regional Recycling Schnitzer Steel
Wood (lumber)	Alpine DBL Gabriola Island Recycling Organization Nanaimo Recycling Exchange Pacific Coast Waste Management Porter Wood

The majority of CD 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
- 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 Demxx and Habitat for Humanity's ReStore.

16 Residual Waste Management

Residual waste refers to discarded materials that are not diverted to reuse, recycling, composting or energy recovery and therefore require landfilling. In 2012, there was roughly 53,000 tonnes of residual waste landfilled in the RDN. The residual waste management infrastructure in the RDN includes the Church Road Transfer Station and the Regional Landfill.

16.1 Church Road Transfer Station

The Church Road Transfer Station (CRTS) is located on Church Road, in Electoral Area F, about four kilometres southwest of downtown Parksville. The facility opened in 1991, and is approximately two hectares in size. CRTS receives garbage, yard waste, wood waste, construction/demolition waste, and recyclables from communities in northern portion of the Regional District of Nanaimo: Parksville, Qualicum Beach, and Electoral Areas E, F, G, and H. In recent years, with the growth of Nanaimo, this facility has also started to receive waste generated in parts of Nanaimo. In 2012, approximately 30% of the region's garbage was delivered to CRTS.

Garbage brought to the CRTS is transferred to the Regional Landfill in Nanaimo. Recyclables are transferred to various recycling processors, and food waste, kitchen waste, and yard waste are transferred to the International Composting Corporation Composting Facility in South Nanaimo.

In 2010, the site was re-designed to accommodate population growth to 2030, include a food waste transfer area and to segregate large commercial-sized waste vehicles from small passenger-sized vehicles and trucks. The new transfer station was built in accordance with the RDN Green Building Policy, and has received LEED Gold® accreditation, the first in Canada for a transfer station.

16.2 Regional Landfill

The Regional Landfill is located about 5 kilometres south of downtown Nanaimo and is owned and operated by the Regional District of Nanaimo. The landfill site opened in the 1940s and is approximately 37 hectares in size. The original unlined "dump" is on an 8.8-hectare portion of the site and was closed and capped with clay in 1996. Next to this site a new landfill with an engineered liner system was constructed. The landfill operates on 13.7-hectares and has been receiving municipal solid waste from the Regional District of Nanaimo since 1991. The photograph below shows the whole property, including the closed and capped unlined portion.

Figure 16-1 Regional Landfill

The Regional Landfill is regulated by the Province of BC and operates under an operational certificate issued by the BC Ministry of Environment. Through the landfill's environment protection measures, landfill gas and leachate are collected from both the lined and unlined areas of the landfill site. Leachate is directed into the sanitary sewer system for treatment at the Greater Nanaimo Pollution Control Centre. The landfill gas (LFG) is collected and managed through a public-private partnership. The LFG is used to produce green power which is sold to BC Hydro. The RDN receives a royalty from these sales. Excess

gas is flared to reduce its greenhouse gas impacts. These environmental protection measures, how the site is designed and operated, and the tipping fees charged to use the site are described in more detail below.

16.2.1 Environmental Protection

The Regional Landfill's environmental protection measures reflect a comprehensive approach to monitoring, evaluating and mitigating the impacts of the landfill's operations on the environment.

Leachate Monitoring Program

When solid waste decomposes it produces leachate, which is accelerated by the percolation of water through the waste in the landfill. Landfill leachate is a complex mixture of organic and inorganic compounds produced from refuse materials by a combination of physical, chemical and biochemical processes.

The Regional Landfill has an extensive leachate containment system, consisting of a high-density plastic liner and perforated pipes to collect leachate for treatment at the regional sewage treatment plant (Greater Nanaimo Pollution Control Centre).

Leachate monitoring is conducted regularly and includes inspection of landfill slopes for leachate breakouts, sampling of leachate for chemical analysis, and measuring leachate elevations in the refuse mass. These tests are important for determining impacts to surface and groundwater, mitigating odours and monitoring for leachate mounding. The chemical analysis is also a requirement by the Ministry of Environment and the RDN Wastewater Department.

Water Quality Monitoring

Migration of leachate from the landfill can affect ground and surface quality. The Regional Landfill's groundwater, surface water, and residential groundwater well monitoring program is designed to ensure landfill operations do not adversely affect water quality.

The water quality monitoring program consists of the collection and analysis of groundwater and surface water samples. Groundwater monitoring wells are located along the perimeter of the site for the purpose of monitoring groundwater quality at the property boundary. Surface water monitoring sites are also located around the perimeter of the site at streams and ditches.

Water samples are analysed for various physical parameters, geo-chemical indicators, dissolved metals and dissolved inorganics. This program allows for early detection and mitigation should leachate be found migrating off the site.

Landfill Gas

Landfill gas is generated as a result of the biological decomposition of organic waste material. In general it is composed of 50% methane and 50% carbon dioxide by volume. Landfill gas, if not captured and

managed can migrate through the landfill cover or adjacent soil and enter the atmosphere. Potential impacts from landfill gas include:

- Greenhouse gas issues (Methane is 20 times more potent of a greenhouse gas than carbon dioxide[13]);
- Health and toxic effects;
- Nuisance odour;
- Explosive hazard; and
- Vegetative stress.

The landfill gas collection system is designed to extract the majority of landfill gas produced. Initially, all of the collected gas was flared to reduce the above noted impacts. However, starting in 2006, Cedar Road Bioenergy, a private company, entered into an agreement with the RDN to build and operate a modular landfill gas utilization plant which is currently producing energy from the landfill gas by converting the gas into 1.2MW of electricity, which is sold into the BC Hydro grid. A photograph of the plant is shown in Figure 16-2.

Figure 16-2 Cedar Road Bioenergy Landfill Gas Utilization Plant at the Regional Landfill

16.2.2 Design and Operations Plan

The Regional Landfill has a Design and Operations Plan (D&O Plan) that details how the landfill development will progress on the site and how it will be operated on a day-to-day basis. One of the D&O Plan's goals is to optimize the use of the space so that the landfill can be a regional asset for as long as possible. The plan incorporates surface water, leachate, and landfill gas management controls into the

[13] From the US EPA Climate Change webpage (http://epa.gov/climatechange/ghgemissions/gases/ch4.html) : The comparative impact of CH_4 on climate change is over 20 times greater than CO_2 over a 100-year period.

long-term landfill development plan and also includes a progressive closure strategy to mitigate potential landfill impacts.

D&O Plans are updated regularly through the life of a landfill. The current plan is a landfill development plan as well as a remedial action plan to address leachate management issues recently identified in a hydrogeological study of the site. The key objectives of the current D&O Plan are to:

- Provide an updated fill plan which addresses the need to reduce leachate generation and optimize surface water controls;
- Address leachate management issues;
- Enhance the collection efficiency of the landfill gas collection system and reduction of fugitive greenhouse gas emissions;
- Update and revise the environmental monitoring program;
- Undertake progressive closure of the site in support of the post-closure nature park concept.

16.2.3 Post Closure Plan

The RDN has prepared a detailed plan for closure and post closure of the Regional Landfill, which has been approved by the BC Ministry of Environment and the Regional Board. Funds are being set aside for closure and monitoring costs and post-closure plans to rehabilitate the site as a community resource. After closure of the landfill, the RDN must operate and maintain pollution mitigation programs and infrastructure for at least 25 years.

In 2004, the RDN completed a study of post-closure options for the Regional Landfill. After consulting with the community in the vicinity of the landfill and City of Nanaimo municipal staff, creation of a nature park was identified as the preferred post-closure use. The vision is to have a park with open areas for recreation opportunities, plantings that enhance wildlife habitat and provide a nature experience for users, hiking trails that integrate into the surrounding area's trail network, and picnic areas and scenic viewpoints.

Figure 16-3 Post Closure Plan for the Regional Landfill: Nature Park

As the landfill will continue to operate for a number of years, the park is to be developed in phases, with the first phase installed on the closed and capped 9-hectare area of the old landfill. A detailed design of the first phase of the nature park is under development by by Nanaimo-based Archadia Landscape Architecture Ltd. and will be the first of its kind on a working landfill in BC.

16.2.4 Estimated Lifespan

When the current D&O plan was prepared in 2011, the remaining available airspace was estimated to be 2.4 million cubic metres. Based upon population growth projections and fill rate assumptions, it is estimated that the site will reach design capacity in 2030.

16.3 Disposal Charges

The RDN charges tipping fees based on the weight of materials brought to the landfill or transfer station. The tipping fees are intended to cover the capital and operating costs of the facilities and the services provided at the sites. Table 16-1 lists the 2013 rates, the most notable being that garbage (referred to in the table as municipal solid waste) is charged at $120 per tonne.

Table 16-1 Accepted Materials and Rates, Effective January 1, 2013

Municipal Solid Waste, excluding Controlled Waste	
Municipal solid waste, construction/demolition waste, roofing waste (asphalt/tar/gravel) 0 - 50 kg 51 kg or greater	 $6.00 flat rate $120.00/tonne
Municipal solid waste containing recyclables 0 - 50 kg 51 kg or greater	$6.00 flat rate $230.00/tonne
Construction/demolition waste containing recyclables 0 - 50 kg 51 kg or greater	$6.00 flat rate $360.00/tonne
Weighing service Improperly covered or secured load	$20.00 each $20.00 each
Recyclables	
Garden Waste 0 - 100 kg 101 kg or greater (roll-off bin loads not accepted)	$6.00 flat rate $55.00/tonne
Wood Waste (includes wood roofing) 0 - 50 kg 51 kg or greater(roll-off bin loads not accepted)	$6.00 flat rate $240.00/tonne
Gypsum (Accepted only at Church Road Transfer Station) 0 - 50 kg 51 kg or greater	$6.00 flat rate $240.00/tonne
Organic Waste (Accepted only at Church Road Transfer Station) 0 - 50 kg 51 kg or greater	$6.00 flat rate $105.00/tonne
Organic Waste (Containing mixed solid waste or recyclables) 0 - 50 kg 51 kg or greater	$6.00 flat rate $210.00/tonne
Metal Recycling, metal appliances 0 - 500 kg 501 kg or greater	$6.00 flat rate $55.00/tonne
Miscellaneous Recyclables (includes non-deposit glass, paper, household plastic containers, metal food and beverage containers, vehicle batteries and oil filters)	$6.00 flat rate
Corrugated cardboard 0 - 50 kg 51 kg or greater	$6.00 flat rate $55.00/tonne
Controlled Waste (Accepted at Regional Landfill only)	
Contaminated soil (Accepted only at Regional Landfill) Large dead animals and asbestos waste (Accepted only at Regional Landfill) Steel cable	$120.00/tonne $240.00/tonne $500.00/tonne

16.4 Resource Recovery

Recovery is defined as the reclamation of energy or recyclable materials from the residual waste prior to landfilling.

16.4.1 Waste to Energy

Over the past decade, the RDN has continued to assess the role of waste-to-energy (WTE) as a means of further reducing the amount of residual waste requiring landfilling and generating local energy. A number of studies have reviewed the state of the various WTE technologies and their anticipated capital and operating costs. Those studies include:

- 2004 – *New and Emerging Residual Waste Management Technologies Update* by Gartner Lee Ltd. This study was done for the RDN and Cowichan Valley Regional District (CVRD) and was a preliminary review of new and emerging residual waste management technologies to determine if any of these technologies might have some applicability to the regional districts in the foreseeable future. The review indicated that there may be some promise for residual waste processing in the future depending on available waste quantities, the change in composition of waste, availability of proven technology, and energy markets. The study recommended that the regional districts continue to monitor the development of the technologies that have proven to be technically viable, including refuse derived fuel, anaerobic digestion, waste-to-energy, gasification and pyrolysis. The study also suggested that for the time being traditional diversion activities may be preferable since it was plausible that a conventional but aggressive waste reduction strategy to divert up to 70% of the solid waste stream.

- 2006 – *Assessment of New Treatment Technologies* by Gartner Lee Ltd. This study was also a collaboration between RDN and CVRD to determine if and when additional waste treatment in the form of thermal processing would be feasible for recovering energy from the residual waste stream. Conventional and advanced thermal technologies were reviewed, as well as refuse derived fuel (RDF). This study reported that the cost of thermal processing of residual waste is about 40% above that of landfilling ($100 per tonne at the time) and therefore not financially attractive, but might become competitive in the near future if energy costs rise, funding assistance becomes available, and low cost financing can be found.

- 2008 – *Assessment of New Treatment Technologies* by Gartner Lee Ltd. This report was an update of the 2006 study and included an expansion of the initial thermal technology review, and an update on some of the environmental issues and costs.

- 2012 – *Tri-Regional Waste to Energy Study* by AECOM. This study was a collaborative effort of the RDN, CVRD and Capital Regional District. The study reviewed the applicability of available technologies in light of the increase tonnage of waste available through the inclusion of the Capital Regional District's residual waste. This study considered the use of mass-burn, gasification and plasma gasification technologies. Mass-burn was confirmed as the most proven, reliable and lowest

cost WTE technology. The study concluded that a single WTE facility would have adequate economies of scale to employ mass-burn; however it would not be at an optimum size from a pricing perspective, which would need to be roughly 3 times larger.

16.5 Closed Landfills

There are two permanently closed municipal solid waste landfills in the RDN. Both the City of Parksville and the Town of Qualicum Beach closed and capped their landfills but continue to monitor the closed sites and provide annual reporting to the BC Ministry of Environment. The permits for these sites have been "abandoned" at the request of the municipalities, meaning that the permits have been rescinded by the Ministry.

There are two private disposal facilities that have also abandoned their permits. These permits were held by J. Milner Trucking and Lussier and Son Contracting for the landfilling of inert wastes and wood waste. Both disposal facilities were located in Nanaimo and permits for both of these sites have been cancelled.

17 Landclearing 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. All of the municipalities and the community of French Creek have banned open burning of land clearing waste. In these areas, land clearing debris is generally 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 for use as hog fuel. There are two private operations in the RDN that receive and process land clearing waste: Pacific Coast Waste Management and Porter Wood Recycling.

In areas of the RDN where land clearing waste can be disposed of through on-site burning, all fires must be managed in accordance with the BC Open Burning Smoke Control Regulation and a reference number must be obtained from the Ministry of Forests. In Extension and East Wellington, a permit to burn landclearing waste must be obtained from the local fire department.

18 Illegal Dumping Prevention Strategy

Illegal dumping on private and public lands has been a long-standing concern in the Regional District of Nanaimo. In 2010, 41 tonnes of illegally dumped material was removed through clean-up initiatives and disposed of appropriately.

Although it represents only .0002% of the total solid waste generated in the region, illegally dumped material can have serious effects on the environment, wildlife habitat and the ability of others to use and enjoy outdoor recreational areas.

The RDN has implemented an Illegal Dumping Prevention Strategy that includes:

- Prevention of illegal dumping through education;
- Funding the clean-up of illegal dump sites; and
- Illegal dumping surveillance and enforcement activities.

The RDN's Waste Stream Management Licensing (WSML) Bylaw includes a section to enforce the proper disposal of waste. The WSML bylaw requires those who generate waste be responsible for its proper disposal. If a generator's waste is found to be abandoned, the generator can be subject to a fine of up to $200,000. This component of the WSML bylaw is the backbone to the RDN's Illegal Dumping Prevention Strategy.

The RDN has a Zero Waste Compliance Officer staff position to carry out illegal dumping prevention and Waste Stream Management License bylaw enforcement and education duties. This position undertakes complaint response, records management, inter-agency/media contacts, establishes the posting of signage in areas subject to illegal dumping activities and conducts historic site monitoring.

In instances where the officer is able to identify the generator, a written warning is issued with a request to clean up the abandoned waste. In most cases this action is sufficient to achieve compliance. In instances where a generator fails to take responsibility, the officer can charge the clean-up costs to the generator and levy a fine. In some cases the RDN will work with the RCMP and/or the Ministry of Environment.

The RDN also works with several organizations that are frequent users of backroads and trails including Vancouver Island University (VIU) woodlot staff, VIU's Resource Management Officer Technology Program, Island Timberlands security, Emcon Services staff and various recreational groups/users. These organizations have volunteered to observe and report illegal dumping activities and sites to assist the RDN in monitoring activities and enhancing enforcement. The RDN also maintains a website page where any member of the public can "Observe, Record and Report" illegal dumping that they come across. All complaints, regardless of the source, result in the opening of a file and an investigation.

In 2012, the RDN responded to 115 incident complaints with 43 tonnes of waste cleaned up by RDN contractors or community groups. A total of 18 files resulted in names being located and individuals directed to clean up or warned about their actions. Two individuals were uncooperative and were scheduled for court appearances and were subsequently fined in 2013. Five additional illegal dumping signs were erected in historical illegal dumping areas as well as a problematic RDN park sites (for a total of 60 signs throughout the RDN). All signs are GPS mapped. Community groups were supported in clean-ups with 15 disposal waivers issued. The illegal dumping program is promoted through Shaw Cable, radio, newspaper and Facebook.

19 Financing of RDN Solid Waste Services

Table 19-1 lists the costs for the various solid waste management related services provided by the RDN, City of Nanaimo and Town of Qualicum Beach. Together, the government costs for solid waste management in 2012 were $17.3 million.

Table 19-1 RDN and Municipal 2012 Solid Waste Expenditures

Service Area	Budget
Residential Collection	
RDN Curbside Collection	$3,775,651
CON Curbside Collection	$3,769,634
TQB Garbage Collection	$173,859
Sub-Total	$7,719,144
Region-Wide Disposal	
Overhead & Administration	$1,162,920
Zero Waste Programs	$514,394
Scale & Transfer Services – Cedar	$1,507,215
Scale & Transfer Services - CRTS	$2,008,190
Disposal Operations	$4,387,105
Sub-Total	$9,579,824
Total	**$17,298,968**

Table 19-2 lists how the Regional District of Nanaimo pays for the solid waste services it provides. As shown, almost all of the RDN's costs (97%) are covered by user fees including tipping fees charged at the landfill and transfer station, and utility fees charged for residential curbside collection services.

Table 19-2 RDN 2012 Solid Waste Revenue Sources

Revenue Source	Amount	Percentage
Tax Requisition	$342,035	2%
Tipping Fees	$9,237,789	53%
Utility Fee	$7,719,144	47%
Total	**$17,298,968**	**100%**

20 Provincial Policies and Legislation

In general, the responsibility for solid waste management belongs to the Province and local governments. Municipalities and regional districts provide solid waste collection, diversion and disposal operations; regional districts are responsible for preparing long-range plans on a regional level; and the Province is responsible for approvals and monitoring of operations such as landfills and waste-to-energy facilities, as well as providing regulations, guidelines and policies to protect the environment and encourage waste minimization. The federal government plays a minor role in solid waste management; occasionally conducting Canada-wide studies on solid waste practices.

The following is a list of BC legislation that influences how solid waste (residual waste, recyclables and compostable waste) is managed by the public, private and non-profit sectors in BC.

- Environmental Management Act
- Contaminated Sites Regulation
- Hazardous Waste Regulation
- Landfill Gas Management Regulation
- Organic Matter Recycling Regulation
- Ozone Depleting Substances and Other Halocarbons Regulation
- Recycling Regulation
- Storage of Recyclable Material Regulation

21 Linkages to Regional Plans

The Regional Growth Strategy and the RDN Board's Strategic Plan are coordinating documents that link land use planning and servicing plans. The RDN Board's Strategic Plan is a three year plan that establishes broad strategic goals for the region and identifies actions and programs for implementation.

The purpose of these two plans is to ensure that regional and local service delivery remains consistent with regional objectives, manages the impacts of growth, and creates livable communities.

This section provides the solid waste-related actions from each of these documents. As these are guiding documents for RDN servicing, this information provides guidance for updating the Solid Waste Management Plan.

21.1 RDN Board's Strategic Plan (2013-2015)

Strategic goals and Actions for 2013-2015 for Solid Waste from the Board's Strategic Plan are:

1. Review and update the 2004 Solid Waste Management Plan (SWMP).
    a. Undertake a new waste composition study to determine changes in the regional solid waste stream resulting from the implementation of the Zero Waste Plan.
    b. Identify further opportunities to reduce waste and establish a new diversion target beyond the 70% currently achieved.
    c. Undertake a comprehensive public consultation process on the SWMP review and update to ensure that the public is engaged and supportive of new policies and programs.
    d. Explore new treatment technologies for residual wastes that save landfill capacity and investigate the need for additional future landfill capacity.

2. Continue to implement the Zero Waste Program on the basis of regulation, collaboration, education, and enforcement.
    a. Ensure private and non-profit waste management and recycling facilities licensed under the Waste Stream Management Licensing Regulation are operating in accordance with approved operating plans.
    b. Expand the commercial food waste ban to include front-of-operations food waste collection systems at fast food restaurants and cafeterias.
    c. Extend the green bin food waste program into multi-family residential developments.
    d. Support provincial product stewardship programs for electronics, small appliances, printed paper and packaging, ensuring a smooth transition to extended producer responsibility.
    e. Explore opportunities for satellite recycling stations or one-stop eco-depots that handle the full range of products regulated by provincial stewardship programs.

3. Implement education and outreach programs to influence behavior and reduce waste.
    a. Participate on the proposed National Zero Waste Marketing Council to develop and implement national strategies designed to reduce the solid waste stream in Canada.
    b. Collaborate with other local governments on Zero Waste campaigns using free advertising copy and graphic designs.
    c. Enhance communications and public education on the importance of waste management, composting, and recycling.
    d. Collaborate with Vancouver Island regional districts and the Lower Mainland in their waste management efforts.

4. Implement the Design & Operations Plan at the Regional Landfill.
   a. Complete a Nature Park on the closed portion of the Regional Landfill.
   b. Examine the feasibility of new capital projects, and implement necessary projects incrementally to optimize costs while meeting the needs of a growing population.
   c. Continue with landfill gas collection and energy distribution initiatives.
   d. Explore opportunities to encourage industry, municipalities, and stakeholders to develop a regional eco-industrial network pilot project to reduce waste and increase economic performance by turning waste into resources.

21.2 Regional Growth Strategy

The Regional Growth Strategy lists the following actions for solid waste management (sections 10.9 to 10.13 of the strategy):

- Pursue an approach to solid waste management that focuses on waste reduction, with the ultimate goal of eliminating the need for waste disposal (i.e. a “Zero Waste” approach).

- Ensure that all new high density developments are designed to support full recycling that includes food waste collection and materials prohibited from entering the RDN landfill.

- Recognize the benefit of integrating solid waste and wastewater disposal streams with private sector initiatives for the recovery of resources, where appropriate. The Solid Waste Management Plan may co-locate solid waste facilities with compatible industries to promote partnerships that recover resources from solid waste disposal.

- Recognize the impact solid waste disposal and processing may have on adjacent land uses and locate future recycling, composting and residual waste disposal sites in locations that minimize the impact on residential communities and the natural environment.

- Consider the potential for aggregate mining sites to be reclaimed for future solid waste disposal sites, if necessary.

Appendix A

Detailed Waste Composition Data (2012)

RDN Waste Composition Study Data (2012)

Material Category	Residential		Commercial		Self-Haul		Totals	
	Waste Stream Percentage	Estimated Tonnes Disposed	Waste Stream Percentage	Estimated Tonnes Disposed	Waste Stream Percentage	Estimated Tonnes Disposed	Waste Stream Percentage	Estimated Tonnes Disposed
Paper	**1.2%**	**637**	**9.5%**	**5,049**	**1.8%**	**969**	**12.5%**	**6,655**
Newsprint	0.1%	76	1.3%	690	0.3%	134	1.7%	900
Cardboard (recyclable)	0.2%	105	2.4%	1,271	0.3%	143	2.8%	1,519
Cardboard (waxed)	0.0%	0	0.0%	1	0.0%	0	0.0%	1
Cardboard (non-recyclable)	0.0%	0	0.2%	108	0.0%	0	0.2%	108
Boxboard / Cores	0.4%	191	1.3%	709	0.2%	128	1.9%	1,028
Office Paper	0.4%	198	2.5%	1,324	0.7%	368	3.5%	1,889
Magazines and Catalogues	0.0%	1	0.2%	106	0.1%	59	0.3%	166
Molded Paper Containers	0.0%	20	0.4%	237	0.0%	25	0.5%	282
Hardcover Books	0.0%	7	0.2%	91	0.2%	87	0.3%	186
Takeout Cups	0.1%	30	0.7%	360	0.0%	23	0.8%	413
Composite Can	0.0%	8	0.0%	21	0.0%	2	0.1%	31
Other Paper	0.0%	1	0.2%	130	0.0%	0	0.2%	131
Plastic	**2.5%**	**1,313**	**8.3%**	**4,421**	**3.0%**	**1,599**	**13.8%**	**7,334**
Bags - Retail (carry-out and grocery)	0.2%	124	0.2%	115	0.1%	44	0.5%	284
Bags - Packaging (film and overwrap)	0.9%	468	2.2%	1,173	0.2%	127	3.3%	1,768
Bags - Non Packaging (ziploc)	0.2%	113	0.7%	379	0.1%	46	1.0%	538
Other Plastic Film (pallet wrap)	0.1%	27	0.9%	473	0.0%	0	0.9%	500
PETE #1	0.1%	71	0.2%	99	0.1%	33	0.4%	202
HDPE #2	0.1%	65	0.4%	235	0.1%	58	0.7%	357
PVC #3	0.0%	0	0.0%	7	0.0%	1	0.0%	8
LDPE #4	0.0%	0	0.0%	6	0.0%	0	0.0%	6
PP #5	0.1%	37	0.2%	131	0.1%	29	0.4%	198
PS #6	0.2%	98	0.8%	450	0.1%	45	1.1%	593
Mixed Resin #7	0.0%	25	0.4%	210	0.0%	25	0.5%	260
Other uncoded plastics	0.2%	104	0.7%	391	0.5%	291	1.5%	786
Durable plastic (non-packaging)	0.3%	180	1.4%	753	1.7%	901	3.4%	1,833
Compostable Organics	**6.2%**	**3,301**	**26.0%**	**13,879**	**2.7%**	**1,453**	**34.9%**	**18,632**
Food Waste	4.5%	2,381	17.6%	9,386	2.4%	1,297	24.5%	13,065
Yard and Garden	0.4%	223	4.7%	2,490	0.0%	12	5.1%	2,725
Compostable Paper	1.3%	696	3.7%	1,987	0.3%	141	5.3%	2,824
Tree Based Wood	0.0%	0	0.0%	16	0.0%	3	0.0%	19
Beverage Containers	**0.2%**	**98**	**1.3%**	**681**	**0.2%**	**86**	**1.6%**	**865**
Aseptic Containers (deposit)	0.0%	8	0.0%	19	0.0%	1	0.1%	29
Aseptic Containers (non-deposit)	0.0%	4	0.0%	9	0.0%	0	0.0%	14
Beverage Pouches (deposit)	0.0%	0	0.0%	11	0.0%	0	0.0%	11
Gable Top Containers (deposit)	0.0%	0	0.0%	8	0.0%	1	0.0%	9
Gable Top Containers (non-deposit)	0.0%	22	0.1%	59	0.0%	15	0.2%	96
Plastic Beverage Containers (deposit)	0.0%	6	0.2%	110	0.0%	18	0.3%	133
Plastic Beverage Containers (non-deposit)	0.0%	25	0.0%	25	0.0%	17	0.1%	67
Plastic Beverage (takeout cups)	0.0%	8	0.1%	72	0.0%	2	0.2%	82
Metal Beverage (deposit)	0.0%	9	0.1%	65	0.0%	4	0.1%	78
Metal Beverage (non-deposit)	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Glass Containers (deposit)	0.0%	16	0.6%	303	0.1%	28	0.7%	347
Glass Containers (non-deposit)	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Textiles	**1.1%**	**576**	**2.0%**	**1,080**	**2.6%**	**1,380**	**5.7%**	**3,037**
Clothing	0.1%	45	0.0%	16	0.1%	64	0.2%	126
Composite Textiles	0.1%	74	0.1%	37	0.3%	167	0.5%	278
Leather	0.0%	5	0.0%	12	0.1%	49	0.1%	66
Natural Fibre Textiles	0.7%	380	1.4%	727	1.3%	690	3.4%	1,798
Synthetic Textiles	0.1%	72	0.5%	288	0.8%	410	1.4%	770
Metals	**0.5%**	**260**	**1.2%**	**656**	**0.7%**	**375**	**2.4%**	**1,291**
Metal Packaging (food)	0.2%	120	0.4%	213	0.0%	25	0.7%	358
Aluminum Foil and Trays (packaging)	0.0%	10	0.0%	4	0.0%	0	0.0%	14
Aluminum Foil and Trays (non-packaging)	0.1%	79	0.2%	89	0.0%	12	0.3%	180

RDN Waste Composition Study Data (2012)

Material Category	Residential		Commercial		Self-Haul		Totals	
	Waste Stream Percentage	Estimated Tonnes Disposed	Waste Stream Percentage	Estimated Tonnes Disposed	Waste Stream Percentage	Estimated Tonnes Disposed	Waste Stream Percentage	Estimated Tonnes Disposed
Non-consumables mixed metals (<0.5kg)	0.1%	51	0.3%	169	0.0%	25	0.5%	245
Non-consumables mixed metals (>0.5kg)	0.0%	0	0.3%	181	0.6%	313	0.9%	494
Glass	**0.5%**	**275**	**1.1%**	**611**	**0.9%**	**500**	**2.6%**	**1,386**
Glass Packaging (food)	0.4%	188	0.6%	299	0.3%	182	1.3%	669
Other Glass and Ceramics	0.2%	86	0.6%	313	0.6%	318	1.3%	717
Building Materials	**0.7%**	**347**	**4.6%**	**2,438**	**5.6%**	**2,963**	**10.8%**	**5,748**
Clean Wood	0.3%	145	1.0%	509	0.8%	403	2.0%	1,057
Treated or Painted Wood	0.2%	88	1.4%	759	0.0%	6	1.6%	853
Gypsum/drywall/plaster	0.0%	0	0.3%	186	1.2%	652	1.6%	838
Masonry/bricks	0.0%	0	0.2%	91	0.5%	241	0.6%	332
Asphalt products	0.0%	0	0.1%	52	0.0%	0	0.1%	52
Carpet & Underlay	0.0%	0	0.8%	437	1.9%	1,004	2.7%	1,441
Flooring (non-wood)	0.0%	0	0.0%	0	0.1%	54	0.1%	54
Other (fiberglass insulation)	0.2%	114	0.8%	404	1.1%	604	2.1%	1,122
Electronics	**0.3%**	**144**	**1.9%**	**997**	**0.3%**	**182**	**2.5%**	**1,323**
Computers and Peripherals	0.0%	0	0.5%	274	0.0%	2	0.5%	276
Televisions and Audio Visual Equipment	0.1%	36	0.5%	257	0.1%	40	0.6%	333
Telephones and Telecommunications Equipment	0.0%	0	0.3%	137	0.0%	9	0.3%	146
Small Kitchen Appliances and Floor Care	0.1%	36	0.5%	243	0.2%	123	0.8%	402
Electronic Toys	0.0%	3	0.0%	3	0.0%	0	0.0%	6
Smoke and CO Detectors	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Other Electronics	0.1%	69	0.2%	83	0.0%	7	0.3%	160
Household Hazardous	**0.3%**	**135**	**2.3%**	**1,220**	**0.3%**	**162**	**2.8%**	**1,516**
Batteries	0.0%	13	0.1%	31	0.0%	1	0.1%	46
Medical/Biological	0.1%	42	0.7%	383	0.0%	0	0.8%	425
Stains/Preservatives	0.0%	0	0.0%	0	0.0%	10	0.0%	10
Latex Paint	0.0%	12	0.3%	163	0.2%	103	0.5%	278
Oil Based Paint	0.0%	0	0.1%	31	0.0%	0	0.1%	31
Aerosols	0.0%	24	0.1%	38	0.1%	35	0.2%	97
Solvents	0.0%	0	0.1%	34	0.0%	0	0.1%	34
Pesticides/Herbicides/Fungicides	0.0%	0	0.0%	3	0.0%	0	0.0%	3
Motor Oil	0.0%	3	0.0%	17	0.0%	0	0.0%	20
Oil Filters	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Anti-Freeze	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Pharmaceuticals	0.0%	1	0.0%	10	0.0%	13	0.0%	23
Other Petroleum Based Products	0.0%	0	0.0%	16	0.0%	0	0.0%	16
Mercury Containing Items	0.0%	0	0.0%	5	0.0%	0	0.0%	5
Other HHW	0.1%	39	0.9%	488	0.0%	0	1.0%	527
Household Hygiene	**3.4%**	**1,829**	**3.1%**	**1,633**	**0.9%**	**470**	**7.4%**	**3,932**
Diapers / Personal Hygiene	2.6%	1,394	2.2%	1,187	0.4%	205	5.2%	2,786
Pet Waste	0.8%	435	0.8%	446	0.5%	266	2.1%	1,146
Other	**0.3%**	**169**	**1.1%**	**572**	**1.6%**	**859**	**3.0%**	**1,599**
Cosmetics / Soaps	0.1%	61	0.1%	75	0.0%	26	0.3%	162
Fines	0.2%	102	0.5%	261	0.0%	7	0.7%	370
Furniture	0.0%	0	0.4%	196	1.5%	825	1.9%	1,021
Rubber/Tires	0.0%	6	0.1%	40	0.0%	0	0.1%	46
White Goods	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Totals	**17%**	**9,083**	**62%**	**33,239**	**21%**	**10,998**	**100%**	**53,319**

Appendix B

Solid Waste Management Facilities in the RDN

Program	Material	NRE	Curbside	Return-to-Retail	District 68	Alpine	BFI-10th	Cascades	DBL	Emterra	GIRO	International Composting	Nanaimo Bottle	PCWM	Reg. Landfill	Regional Recycling	Schnitzer Steel	District 69	Church Rd. Transfer Stn	Parksville Bottle Depot	Porter Wood	Qualicum Beach Bottle Depot
Packaging and Paper Products	Beverage cont.	X	X				X		X				X			X			X	X		X
	Cardboard	X	X			X	X	X	X	X	X		X		X	X			X	X		X
	Glass	X							X	X	X				X				X	X		
	Milk jugs	X	X				X		X	X	X		X		X	X			X	X		X
	Mixed paper	X	X				X	X	X	X	X				X				X			
	Newsprint	X	X				X	X	X	X	X				X				X			
	Plastic 1-7	X	X				X	X		X	X				X				X			
	Plastic bags	X						X		X			X			X				X		X
	Waxed cartons	X	X				X		X	X	X		X		X	X				X		X
	Styrofoam	X																		X		
Extended Producer Responsibility	Small appliance	X									X		X			X	X			X		
	Electronics	X									X		X			X	X			X		
	Paint/Solvent	X														X				X		
	Gasoline	X														X				X		
	Pesticide	X														X				X		
	Antifreeze	X									X					X						
	Used Oil	X									X											
	Batteries	X									X		X			X						
	Car battery	X									X				X		X		X	X	X	
	Cellphone	X											X			X						
	Fluores. Tubes	X									X											
	Lg Appliances	X							X		X				X	X	X		X	X	X	
	Medications			X																		
	Smoke alarm	X																				
	Tires	X																				
Construction/Demo	CD					X			X						X							
	Wood Waste	X				X			X		X	X		X	X				X		X	
	Yard Waste	X				X			X			X		X	X				X		X	
	Land Clearing					X			X					X							X	
	Gypsum					X			X										X			
	Asphalt Shingles					X			X					X	X				X			
Misc	Textiles*	X	X				X															
	Scrap Metal	X				X	X		X					X			X		X	X	X	

* Textiles are collected in the RDN program.