

# Regional District of Kitimat-Stikine

## *Background Information and Assessment of the Current Solid Waste System – 2018 Update*

Rev. 1.1

January 4, 2019

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Regional District of  
**Kitimat-Stikine**

## List of Acronyms

<b>Acronym</b>	<b>Meaning</b>
C&D	Construction and demolition waste
CO	Conservation Officer
DLC	Demolition and land clearing waste
DO	Drop off (self-hauled waste)
EPR	Extended Producer Responsibility
HDPE	High-Density Polyethylene
ICI	Institutional, Commercial and Industrial
LF	Landfill
LFG	Landfill gas
MF	Multi-family residential
MOTI	Ministry of Transportation and Highways
RIG	Revelstoke Iron Grizzly
RDKS	Regional District of Kitimat-Stikine
SF	Single family residential
SWMP	Solid Waste Management Plan
TS	Transfer Station

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## 1 Introduction

The Regional District of Kitimat-Stikine (RDKS) is preparing to develop a new Solid Waste Management Plan (SWMP; “the Plan”) to replace the SWMP that was approved in 1995. The process to develop the new Plan will generally follow the four-step process outlined in “A Guide to Solid Waste Management Planning”, published by the Ministry of Environment in 2016.

This document provides background information on the area covered by the plan, including

- A map of the region showing participating municipalities, First Nations and adjacent regional districts;
- Pertinent information from official community plans, regional growth strategies and other regional documents (e.g., relating to airshed management or emergency debris management);
- Population statistics (current and projected for the next 10 to 20 years);
- A description of the economic base of the area;
- A description of the topography, including any physical constraints affecting waste management, and
- Climate adaptation and mitigation considerations for the region, especially as it relates to waste management.

This document also describes the current waste management system, including:

- The sources, composition and quantities of municipal solid waste generated within the planning area;
- Materials that are not typical municipal solid waste that are handled at municipal solid waste management facilities in the region;
- How the principles of “reduce” and “reuse” are addressed by the current system;
- Collection systems for recycling, recovery and residual management;
- The existing and planned solid waste management capacity, including remaining available disposal capacity and projected needs of the region;
- Product stewardship programs active in the region, and
- Education programs, including those supporting behaviour change.

Implementation of the 1995 plan was documented and presented to the Regional District Board of Directors in January 2017.

This document was first prepared and presented to the Plan Monitoring Advisory Committee (PMAC), the committee that advised on implementation of the 1995 SWMP, in August 2017. It was reviewed and revised in late 2018 with up to date numbers and to reflect the implementation of the Hazelton and Highway 37 North Servicing Plan.

## 2 Background Information

### 2.1 Plan Area

The 1995 Solid Waste Management Plan applies to the entire RDKS. The RDKS is located in northwestern BC and covers 104,464.61 square kilometers<sup>1</sup>. The boundaries are shown on Figure 1. The RDKS is bounded by the Stikine region to the north and east, the Bulkley-Nechako Regional District to the east, Alaska and the Skeen-Queen Charlotte Regional District to the west, and the Central Coast Regional District to the south.

Municipalities within the RDKS are: City of Terrace, District of Kitimat, District of New Hazelton, the Village of Hazelton, and the District of Stewart. Electoral Areas within the RDKS are: Electoral Areas A, B, C, D, E and F. The RDKS also includes the Nass Valley, which is governed by the Nisga'a Lisims Government.

The RDKS has defined two service areas within its boundaries: the Terrace Service Area and the Hazelton and Highway 37 North Service Area. The Terrace Service Area includes the City of Terrace and all of Electoral Areas C and E. The Hazelton and Highway 37 North Service Area includes the District of New Hazelton, the Village of Hazelton, the District of Stewart, and Electoral Areas A, B and D. Electoral Area F and the District of Kitimat are not currently included in any Service Area, as the RDKS does not provide waste services in those areas.

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<sup>1</sup> Data from Statistics Canada, based on the 2016 census, accessed April 12, 2017 from <http://www12.statcan.gc.ca/census-recensement/2016/as-sa/fogs-spg/Facts-cd-eng.cfm?LANG=Eng&GK=CD&GC=5949>



## 2.2 Topography

The main topographic challenge affecting waste management is the distance separating communities.

## 2.3 Population

The total population of the RDKS in 2016 was 37,367<sup>2</sup>. The overall population density in the RDKS is 0.4 persons per square kilometre. The population distribution is shown in Table 1.

Table 1. RDKS Population Breakdown

Area	Area Type	2016 Population <sup>3</sup>	% of Total RDKS population
Kitimat-Stikine	RD	37,367	100%
Hazelton	VL	313	1%
Kitimat	DM	8,131	22%
New Hazelton	DM	580	2%
Nisga'a	NL	1,880	5%
Stewart	DM	401	1%
Terrace	CY	11,643	31%
Indian Reserves	IR	5,635	15%
Kitimat-Stikine A	RDA	20	0%
Kitimat-Stikine B	RDA	1,473	4%
Kitimat-Stikine C (Part 1)	RDA	2,834	8%
Kitimat-Stikine C (Part 2)	RDA	5	0%
Kitimat-Stikine D	RDA	99	0%
Kitimat-Stikine E	RDA	3,993	11%
Kitimat-Stikine F	RDA	360	1%

Area Types:

- CY = City
- DM = District Municipality
- NL = Nisga'a Land
- IR = Indian Reserve
- RD = Regional District
- RDA = Regional District Electoral Area
- VL = Village

Population projections by BC Statistics for the whole RDKS indicate that the population is expected to grow to about 38,442 people (a 3% increase) by 2025 (five years following the expected adoption of the new SWMP), and to about 39,241 (a 5% increase) by 2030 (10 years after the anticipated plan

<sup>2</sup> Data from Statistics Canada, based on the 2016 census, accessed April 12, 2017 from <http://www12.statcan.gc.ca/census-recensement/2016/as-sa/fogs-spg/Facts-cd-eng.cfm?LANG=Eng&GK=CD&GC=5949>

<sup>3</sup> Data from BC Statistics, based on the 2016 census, accessed April 12, 2017 from <http://www.bcstats.gov.bc.ca/StatisticsBySubject/Census/2016Census/PopulationHousing/MunicipalitiesByRegionalDistrict.aspx>



adoption).<sup>4</sup> These population forecasts may not take into account the latest announcements regarding the development of a natural gas processing and exporting facility in Kitimat.

For the purposes of waste management planning, it is important to know where the growth will happen. The Official Community Plan (OCP) for each municipality or village provides a population projection. The bulk of the growth projected for the RDKS will occur in the City of Terrace. The OCP for Stewart also indicates that some growth is expected. Growth in the District of Kitimat is highly dependent on external forces. No growth is projected for Hazelton or New Hazelton. The RDKS projects that modest growth may occur in the Thornhill area (Electoral Area E) of the RDKS if major industrial development occurs in the region. Detailed growth projection information for each area (excerpted from the relevant OCPs) are provided below.

### 2.3.1 City of Terrace

The City of Terrace conducted a population projection study after its most recent OCP. That study conservatively projects a growth of nearly 1,000 people by 2023, which is about one third of the total growth projected for the RDKS in that timeframe<sup>5</sup>. Less conservative estimates range from 5,300 to 12,100 new people by 2023, both of which exceed the total projected growth for the whole regional district. Projections for Terrace do not extend to 2038.

Table 2. Terrace Population Projections

	<b>Low Growth</b>	<b>Medium Growth</b>	<b>High Growth</b>
2016 (actual)	11,643	11,643	11,643
2025	12,635	17,831	26,279

### 2.3.2 District of Stewart

The District of Stewart also presents three population projections in its OCP.<sup>6</sup> The District of Stewart is expected to grow by between 99 and 794 people by 2024 (note that projections for 2025 were not include in the OCP). A projection for Stewart is also available from BC Statistics, because the boundaries of Stewart align closely with the boundaries of the Snow Country Local Health Area, and BC Statistics provides projections for Local Health Areas.

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<sup>4</sup> Data from BC Statistics, accessed November 6, 2018 from <https://www.bcstats.gov.bc.ca/apps/PopulationProjections.aspx> (select Regional District as the region type)

<sup>5</sup> Data from City of Terrace Population Survey and Projections, accessed November 6, 2018 from <http://www.terrace.ca/sites/default/files/docs/business-development/cityofterrace-populationsurveyandprojections.pdf>

<sup>6</sup> Data from District of Stewart OCP, accessed at [http://districtofstewart.com/docs/2014\\_OCP\\_Final\\_-\\_Nov\\_2014\\_\(with\\_signatures\).pdf](http://districtofstewart.com/docs/2014_OCP_Final_-_Nov_2014_(with_signatures).pdf)

Table 3. Stewart Population Projections.

	BC Stats (Snow Country Local Health Area)	Low growth	High growth
2016 (Actual)	401		
2024	500	570	1195
Absolute change	99	169	794
% change	25%	42%	198%

### 2.3.3 District of Kitimat

The population of Kitimat is difficult to project because it is so closely linked to the growth and decline of export-oriented industries affected by global markets and provincial resource policy decisions. Projections in Kitimat’s OCP range from growing to 13,621 (from the 2016 population of just over 8,000) to declining to 5,079 people by 2026.<sup>7</sup> The mean projection shows the population remaining stable. Whether Kitimat experiences population growth, stability or decline is contingent on economic conditions which are impacted by factors such as the global economy, housing conditions elsewhere and changes in government policy. A recent announcement of approval for the liquified natural gas terminal in Kitimat means that temporary residents are expected in the region, and may peak at or near 10,000 during construction.

### 2.3.4 District of New Hazelton

The District of New Hazelton does not provide population projections in its OCP.<sup>8</sup> It notes that the population decreased between 2001 and 2006, and increased by about the same amount between 2006 and 2011. According to population estimates from BC Statistics, the population dropped slightly again between 2011 and 2016<sup>9</sup> (note that BC Statistics does not provide projections). It therefore seems likely that the population will remain relatively stable for the next 10 years.

### 2.3.5 Village of Hazelton

The Village of Hazelton also does not provide population projections or any commentary on its population trends in its OCP. Population estimates from BC Statistics for 2001 to 2016 show a population decline from 354 to 257<sup>10</sup> (note that BC Statistics data varies from 2016 census data, which reported a population of 313 for the Village of Hazelton). The population of Hazelton may continue to decline over the next 10 years.

<sup>7</sup> Data from the District of Kitimat OCP, accessed at <https://www.kitimat.ca/en/business-and-development/resources/Documents/Official-Community-Plan.pdf>

<sup>8</sup> Data from the District of New Hazelton OCP, accessed at [http://newhazelton.ca/images/uploads/BL\\_332\\_Official\\_Community\\_Plan.pdf](http://newhazelton.ca/images/uploads/BL_332_Official_Community_Plan.pdf)

<sup>9</sup> Data from BC Statistics, accessed at <http://www.bcstats.gov.bc.ca/Files/285cd56c-9be1-4c5e-a153-3deeffa2ac94/BCDevelopmentRegionRegionalDistrictandMunicipalPopulationEstimates2011-2015.xls>

<sup>10</sup> Data from BC Statistics. 2001-2011 data accessed at: <http://www.bcstats.gov.bc.ca/Files/0379a32f-cec8-438d-83e0-6724b2a2a272/BCDevelopmentRegionRegionalDistrictandMunicipalPopulationEstimates2001-2011.xls>, 2011 to 2016 data is at <http://www.bcstats.gov.bc.ca/Files/285cd56c-9be1-4c5e-a153-3deeffa2ac94/BCDevelopmentRegionRegionalDistrictandMunicipalPopulationEstimates2011-2015.xls>

### 2.3.6 Thornhill

The draft OCP for Thornhill (Electoral Area E) includes two population projections: the first is for a business as usual scenario, and the second considers the implications of major industrial development.<sup>11</sup> Under the business as usual scenario, minimal growth is expected in the area (20 additional people by 2036). Under the growth scenario, an additional 419 people are expected by 2036.

## 2.4 Economic base

According to 2016 Census data<sup>12</sup>, the main industries (by labour force) for the region were (in order): health care and social assistance, retail trade, construction, accommodation and food services, manufacturing, educational services, and public administration. Those seven categories account for nearly 70% of the employment. The main economic activities within the RDKS include mining, forestry, energy, fishing, and transportation. The area is home to several mills and multiple hydro projects. The economic activities in the RDKS mean there are a number of industrial work camps in the area. These camps consist of buildings used for residential accommodations and support for industrial construction project workers. Camp residents are provided with individual sleeping units, individual or communal bathroom facilities, and meals provided in communal dining areas. The domestic waste from these camps is not substantially different from typical municipal solid waste, and is accepted at designated solid management waste facilities in the region. New mining, forestry, oil and gas and/or energy developments in the region may result in a significant increase in waste from industrial work camps and construction.

## 2.5 Emergency Debris Management

The RDKS's 2013 Emergency Plan identifies a number of potential causes of emergency situations and the responses that should be taken. The majority of the potential causes do not specifically address issues related to solid waste. An animal epidemic is the only situation which specifically mentions waste, and the Emergency Plan notes that "the threat of an animal epidemic is fairly low given the number of agricultural producers within the area." If an epidemic occurs, the Ministry of Agriculture and the BC Centre for Disease Control would need to coordinate disposal of infected animals with the RDKS Works and Services department. Other emergency situations such as dam failures or earthquakes could result in the generation of large quantities of demolition waste, but clean up after the situation ends is not within the scope of the Emergency Plan. Future revisions of the Emergency Plan could expand on the disposal of debris generated by floods and fires (e.g. residential and commercial property demolition).

The Emergency Plan defines specific roles that would be activated during emergency situations. This includes the role of Environmental Branch Coordinator (EBC). That person would be responsible for coordinating local response to hazardous spills, waste disposal and water system failure, and liaising with regional and provincial environment officials and the private sector. During an emergency situation, the EBC will determine the status and availability of waste storage and disposal facilities in the area.

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<sup>11</sup> Data from the Thornhill OCP, accessed at [https://www.rdks.bc.ca/sites/default/files/full\\_thornhill\\_ocr\\_-\\_master\\_copy\\_-\\_march\\_2018.pdf](https://www.rdks.bc.ca/sites/default/files/full_thornhill_ocr_-_master_copy_-_march_2018.pdf)

<sup>12</sup> Data from the 2016 National Census, as cited by the Province of British Columbia  
<http://www.britishcolumbia.ca/invest/communities/british-columbia/north-coast/kitimat-stikine/>

### 3 Characteristics of Waste Generated in the RDKS

Waste management services in the RDKS are separated into the Terrace Service Area and the Hazelton and Highway 37 North Service Area. The two service areas differ in terms of the disposal and diversion services and infrastructure, and in terms of the type and amount of information available about the waste. The majority of waste in the Terrace Service Area flows through disposal or diversion facilities that are equipped with weigh scales, and a waste characterization study was conducted in 2017 that examined garbage from both the residential and Industrial, Commercial and Institutional (ICI) sectors. None of the waste management facilities in the Hazelton and Highway 37 North Service Area are equipped with weigh scales, and a waste characterization study has not been conducted. Therefore, information on waste composition and sources is presented separately by service area in Sections 3.2 and 3.3.

Section 3.1 presents information about the quantity of waste disposed and diverted across the entire Regional District.

#### 3.1 Quantity of Waste

Table 4 contains the best available information on waste disposal and diversion for the entire RDKS. Some diversion figures are known with a relatively high degree of certainty and can be isolated for a specific service area (e.g. ICI cardboard recycling and residential curbside recycling), whereas other diversion numbers are estimates and/or are available only for the RDKS as a whole (e.g. extended producer responsibility (EPR) programs report by regional district). The total diversion number is believed to be an underestimate because of the lack of available information about the quantity of recycling undertaken by the private sector (e.g. scrap metal dealers and retailers who backhaul their recyclables to the Lower Mainland).

The quantities listed below are for 2017, the last complete year before this report was compiled. An estimate for 2018 is provided for some figures, based on data through October, assuming average monthly quantities for November and December.

Table 4. Waste Flows (2017)

Waste Stream	2017 Tonnes	Notes	Source
<b>Disposal</b>			
Forceman Ridge Landfill	6903	Estimate for 2018: 8724	Scale data
Rosswood landfill	50		Estimate (no scale at facility)
Kitimat landfill	6250		Estimate (no scale at facility)
Iskut landfill	150		Estimate (no scale at facility)
Meziadin landfill	2800	Includes municipal type waste from large industrial sources	Estimate (no scale at facility)
Hazelton Waste Management Facility	3100		Estimate (no scale at facility)
Stewart landfill	300		Estimate (no scale at facility)

Telegraph Creek landfill	150		Estimate (no scale at facility)
New Aiyansh landfill	1200		Estimate (no scale at facility)
Dease Lake landfill	100		Estimate (no scale at facility)
<b>Total Tonnes Disposed</b>	<b>21,003</b>		
<b>Diversions</b>			
City of Terrace composting	500		Estimate (no scale at facility)
Forceman Ridge composting	1402	Estimate for 2018: 1682	Scale data
RDKS residential curbside recycling (not covered by EPR program)	212	Net of contamination. Estimate for 2018: 194	Reported by Do Your Part Recycling (processor)
RDKS recycling depots in Hazelton and Highway 37 North Service Area (not covered by EPR program)	4.54	Actuals for 2018: 48.49	Facilities were only in place for the last two months of 2017.
Backyard composting	13		Based on 75 units sold by the RDKS, and 31 sold by municipal governments; assuming 125kg/unit/year
Local ICI cardboard recycling	848	Estimate for 2018: 751	Based on invoicing and reporting by Do Your Part Recycling.
ICI recycling (backhaul to lower mainland)	Unknown		
Private sector scrap metal and C&D material recycling	Unknown		
EPR programs (based on data reported by EPR agencies)	3,023		
Alarms	0		<a href="https://www.productcare.org/wp-content/uploads/2018/07/FINALE-AlarmRecycle-2017-Annual-report.pdf">https://www.productcare.org/wp-content/uploads/2018/07/FINALE-AlarmRecycle-2017-Annual-report.pdf</a>
Batteries (consumer)	5		<a href="http://www.call2recycle.ca/download/21576/">http://www.call2recycle.ca/download/21576/</a> Based on 620 tonnes collected in BC, assuming average per capita contribution in the RDKS
Beer containers	195		<a href="http://envirobeerbc.com/wp-content/uploads/2018/06/BRCCC-Annual-Report-to-the-Director-NonFinancial-Calendar-Year-2017_plus-KPMG.pdf">http://envirobeerbc.com/wp-content/uploads/2018/06/BRCCC-Annual-Report-to-the-Director-NonFinancial-Calendar-Year-2017_plus-KPMG.pdf</a>
Beverage containers	579		<a href="https://www.return-it.ca/ar2017/pdf/AnnualReport.pdf">https://www.return-it.ca/ar2017/pdf/AnnualReport.pdf</a>

Electronics	142	Based on 3.8 kg per capita provincial average because RDKS-specific data is not available	<a href="http://epra.ca/wp-content/uploads/2018/06/EPRA_Annual_Report_ENG_2017_Final.pdf">http://epra.ca/wp-content/uploads/2018/06/EPRA_Annual_Report_ENG_2017_Final.pdf</a>
Lead-acid batteries	171		<a href="http://www.canadianbatteryassociation.ca/images/2017_CBA_Annual_Report_BC.pdf">http://www.canadianbatteryassociation.ca/images/2017_CBA_Annual_Report_BC.pdf</a>
Lighting equipment	30,119 lighting units	No conversion factor to tonnes published	<a href="https://www.productcare.org/wp-content/uploads/2018/06/BC-Lights-2017-Annual-Report.pdf">https://www.productcare.org/wp-content/uploads/2018/06/BC-Lights-2017-Annual-Report.pdf</a>
Major appliances	162		<a href="https://www.marrbc.ca/documents/MARR-Annual-Report-2017.pdf">https://www.marrbc.ca/documents/MARR-Annual-Report-2017.pdf</a>
Medication	0.7	Based on 0.018 kg per capita provincial average because RDKS-specific data is not available; 2016 data is most recent available.	<a href="http://www.healthsteward.ca/news/bc-news-release-may-2017">http://www.healthsteward.ca/news/bc-news-release-may-2017</a>
Packaging and printed paper	670	Covers City of Terrace, Border Town Recycling depot (Stewart), Do Your Part Recycling depot (Terrace), Kitimat Bottle Depot and Hazelton Bottle Depot	<a href="https://recyclebc.ca/wp-content/uploads/2018/06/RecycleBCAR2017-June292018.pdf">https://recyclebc.ca/wp-content/uploads/2018/06/RecycleBCAR2017-June292018.pdf</a>
Paint, aerosols, solvents, pesticides	135 tubskids	No conversion factor to tonnes published; tubskids are 4'x4'x3' plastic boxes	<a href="https://www.productcare.org/wp-content/uploads/2018/06/2017-BC-Paint-HHW-Annual-Report-FINAL-to-Website.pdf">https://www.productcare.org/wp-content/uploads/2018/06/2017-BC-Paint-HHW-Annual-Report-FINAL-to-Website.pdf</a>
Small appliances	38	Based on 1.0 kg per capita provincial average because RDKS-specific data is not available	<a href="https://www.electrorecycle.ca/wp-content/uploads/2018/06/CESA-2017-Annual-Report-to-Members-Final.pdf">https://www.electrorecycle.ca/wp-content/uploads/2018/06/CESA-2017-Annual-Report-to-Members-Final.pdf</a>

Thermostats	Not available in tonnes	46 mercury-containing thermostats, 1 electronic thermostat and 1 loose vessel (which had been clipped out of a thermostat)	<a href="https://www.hrai.ca/uploads/userfiles/files/2017%20Annual%20Report%20for%20the%20Province%20of%20British%20Columbia.pdf">https://www.hrai.ca/uploads/userfiles/files/2017 Annual Report for the Province of British Columbia.pdf</a>
Tires	538		<a href="http://www.tsbc.ca/pdf/TSBC-AnnualReport2017.pdf">http://www.tsbc.ca/pdf/TSBC-AnnualReport2017.pdf</a>
Used Oil and Antifreeze	470 73,796 29 24	tonnes of oil (528,221 litres) filters (no weight conversion available) tonnes of containers tonnes of antifreeze (20,793 litres)	<a href="http://bcusedoil.com/wp-content/uploads/2018/06/BCUOMA_AR_2017.pdf">http://bcusedoil.com/wp-content/uploads/2018/06/BCUOMA_AR_2017.pdf</a>
<b>Total Tonnes Diverted</b>	<b>6,003</b>		
<b>Total Generation (disposal + diversion)</b>	<b>27,006</b>		
<b>Diversion Rate (diversion ÷ generation)</b>	<b>22%</b>		

Note that data was not available from the following EPR programs: cell phones, electrical outdoor power equipment, and medications.

In 2017, the RDKS disposed of an estimated 27,000 tonnes of municipal solid waste, and accounted for just over 6,000 tonnes of diversion. These two figures result in a calculated diversion rate of 22%.

The BC Ministry of Environment and Climate Change Strategy has moved towards setting goals in terms of disposal per capita, rather than diversion rate, because of the widespread difficulty in measuring all diversion. According to the Ministry, the average British Columbian disposed of 472 kg of waste in 2016. The provincial government has set a goal of lowering the municipal solid waste disposal rate to 350 kg per person by 2020. The per capita disposal rate in the RDKS in 2017 was 562 kg, including waste from industrial camps. This is significantly lower than the disposal rate of 769 kg per capita on record with the BC Ministry of Environment and Climate Change Strategy (2016 data).

In contrast to the remainder of the RDKS, the Terrace Service Area disposed of 424 kg per capita in 2017. This number is based on residential and ICI waste, small loads of DLC waste, and controlled waste that was generated inside the service area. An assumption could be made that the difference between the disposal rate in the Terrace Service Area and the rest of the RDKS is due to the disposal restrictions and diversion programs in the Terrace Service Area; however, a look at the diversion data shows that the diversion rate in the Terrace Service Area was similar to the diversion rate in the whole RDKS. The next assumption could be that the difference is due to the waste from industrial camps, which increases the quantity disposed but does not contribute to the population; however, only 123 tonnes of industrial

refuse and 253 tonnes of industrial DLC were disposed in 2017. Subtracting those amounts from the total disposed yields a per capita disposal rate of 552 kg per capita, which is still substantially higher than the disposal rate in the Terrace Service Area. This appears to indicate that the lower disposal rate in the Terrace Service Area is due to reduced waste generation, not increased diversion.

### 3.2 Terrace Service Area Details

#### 3.2.1 Waste Composition

The RDKS conducted a large-scale waste composition study at the Thornhill Transfer Station in 2017. The study examined representative samples from the residential and ICI sectors and waste that is dropped off by generators.

The residential and ICI sectors were similar to each other and together account for 86% of the waste arriving at the transfer station. Paper and compostable organics each made up nearly 20% of the overall waste, followed by compostable organics (19.5%), and plastic (15.3%). It is important to note that every one of these waste categories is restricted from disposal.

Residential waste from the City of Terrace and from the RDKS collection routes were similar, although residential garbage from the City contained more organics than the residential garbage from the RDKS collection area (24.3% vs 19.6%). Waste dropped off by generators was dominated by non-compostable organics (i.e. dimensional lumber), building materials, glass and bulky objects (i.e. furniture, carpet). This is illustrated in the following chart.

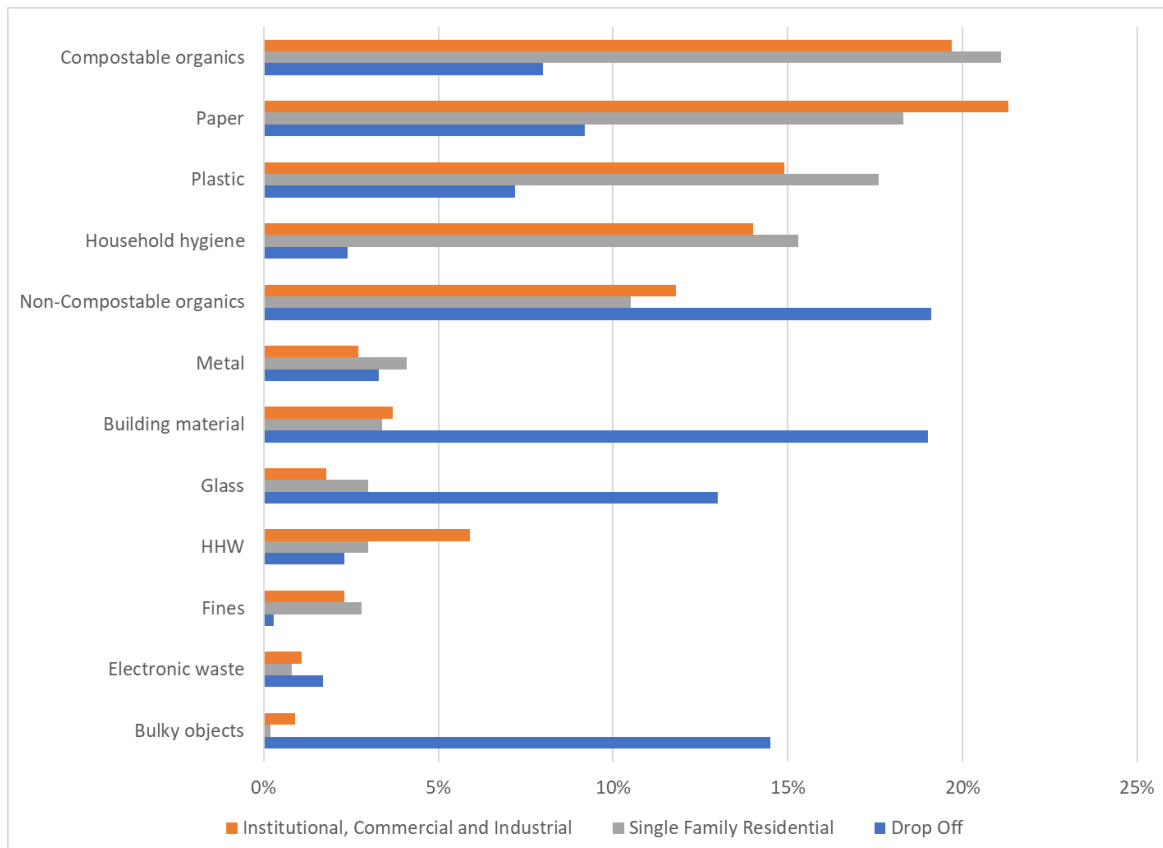


Figure 2. Thornhill Waste composition 2017



Figure 3 shows that 67% of the material brought to the Thornhill Transfer Station is restricted from disposal and could be managed by the composting and recycling systems, indicating a need for more uptake of the existing diversion systems.

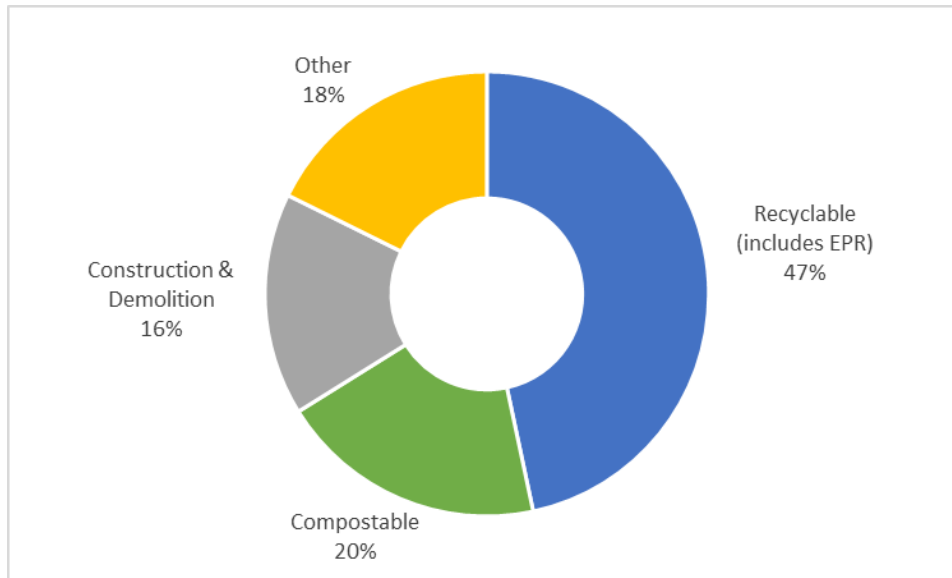


Figure 3. Waste categories by optimal management technique

### 3.2.2 Waste Handling

Nearly one third of the waste is composted or recycled in the Terrace Service Area. While this is higher than the diversion rate for the RDKS overall, the diversion rate is still substantially lower than it could be, given the disposal restrictions in place and the diversion opportunities available.

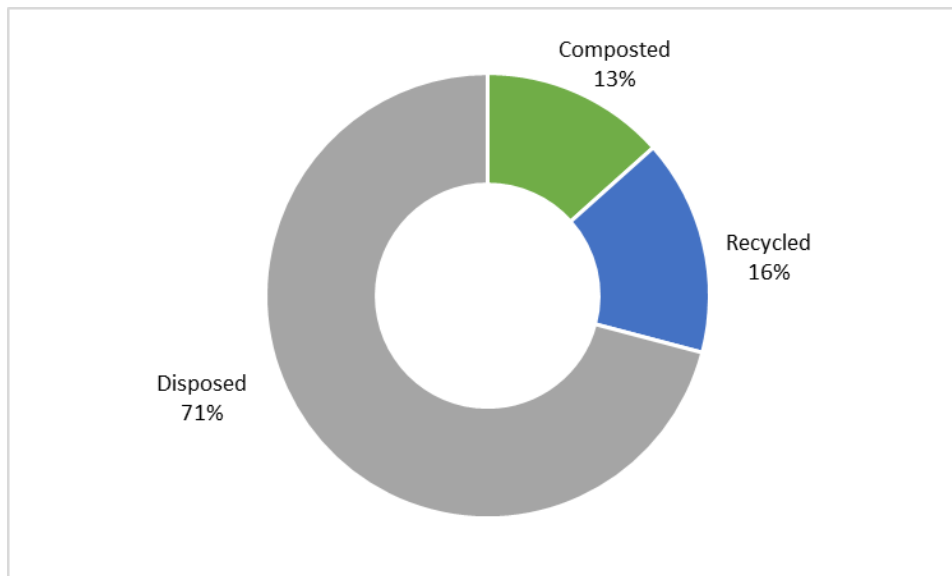


Figure 4. Diversion in the Terrace Service Area

### 3.2.3 Waste Generators

Approximately 50% of the total waste (garbage, recycling and organics) is generated by the ICI sector. The other 50% is divided between the residential and construction and demolition (C&D) sectors, and materials that are dropped off by generators (i.e. self-hauled) for which no sector is reported.

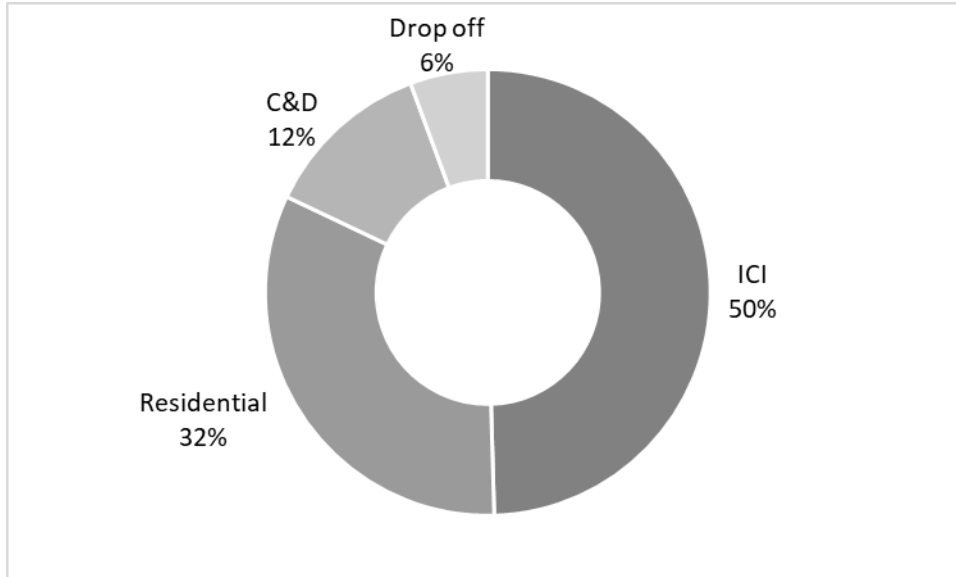


Figure 5. Waste generation by sector in the Terrace Service Area

A similar pattern exists for waste disposal, although effective diversion programs for the residential sector mean that although that sector generates 32% of the waste, it is responsible for only 26% of the disposal. The DLC sector has a proportionally higher disposal rate.

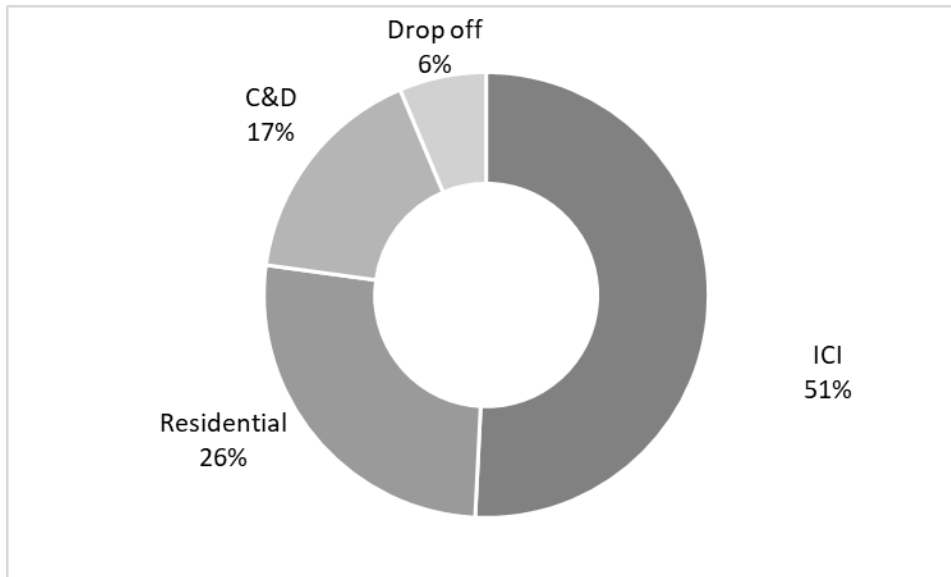


Figure 6. Waste disposal by sector in the Terrace Service Area

It is also possible to calculate the diversion rate by sector. The residential sector has the highest diversion rate at 43%. The diversion rate for the ICI sector is 27%, and the diversion rate for materials

dropped off the transfer station by the generator is 21%. C&D materials have the lowest diversion rate, at 5%. The proportion of waste that is disposed, recycled and composted for each waste source is illustrated in Figure 7.

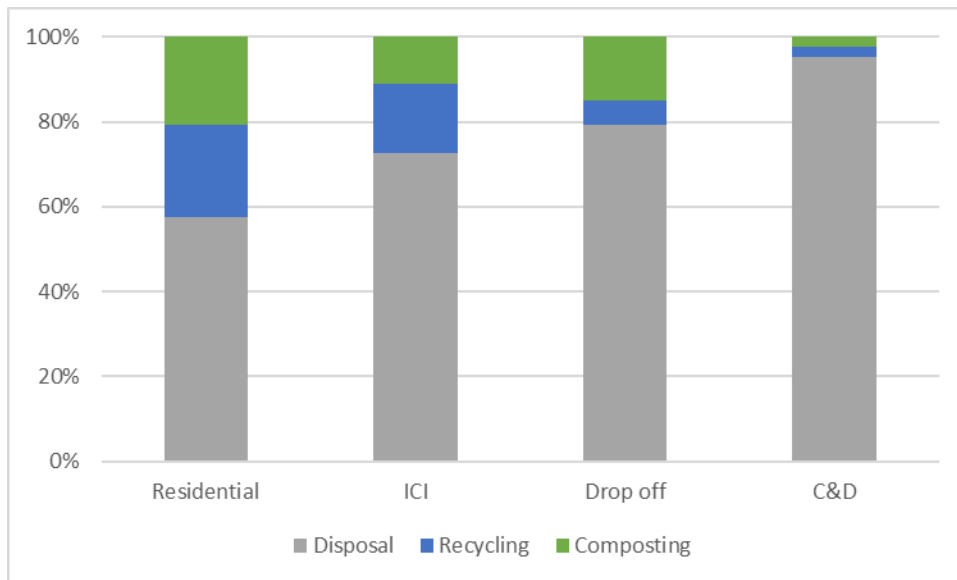
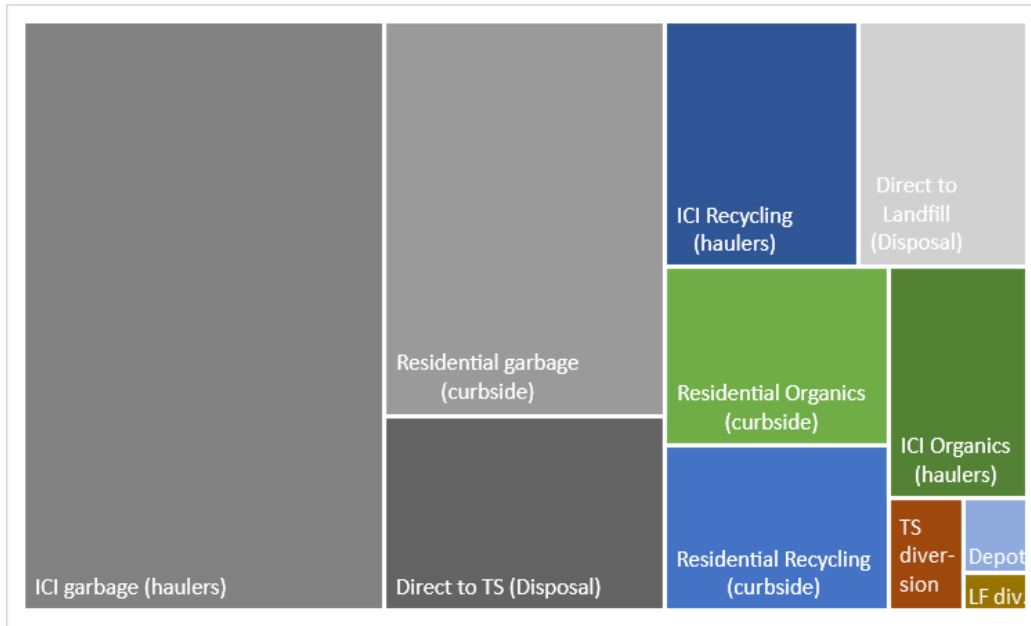


Figure 7. Diversion Rates by Sector

The curbside recycling and organics programs for the residential sector contribute almost equally to the sector’s diversion rate. The residential recycling depot collects a much smaller portion of the diverted waste, although the cost of the depot is covered by Recycle BC. The ICI sector achieves more of its diversion through recycling than through organics diversion. Drop off diversion is achieved by segregating yard and garden waste, metal, white goods and propane tanks at the transfer station. C&D diversion is achieved by segregating clean wood at the transfer station and by using some contaminated soil onsite at the landfill.

The following figure illustrates how many tonnes each waste service handles. The size of each box is proportional to the quantity of waste managed by each service.



Note: TS means transfer station and LF means landfill

Figure 8. Share of waste among services

This information can also be visualized as flows from sources to destinations. In this case, the sources are the sectors and the destinations are recycling, composting and landfilling.

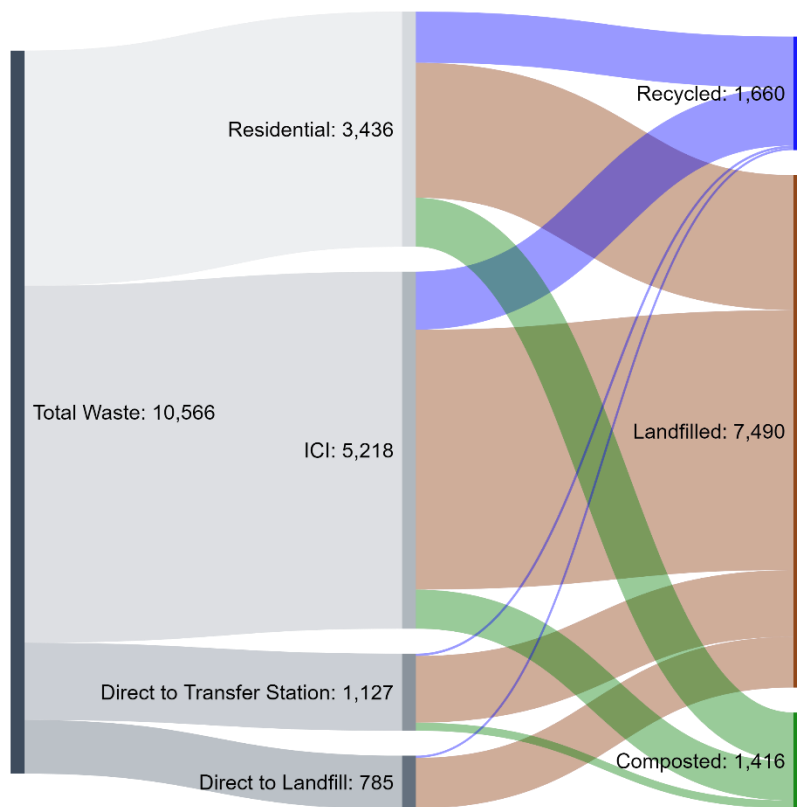


Figure 9. Material flows in the Terrace Service Area (all numbers are tonnes)

### 3.3 Hazelton and Highway 37 North Service Area

The information presented for this service area is largely estimates based on surveys of airspace consumption and year-to-year comparisons of the amount of waste received.

#### 3.3.1 Waste Composition

A waste composition study has not been conducted in the Hazelton and Highway 37 North Service Area. There are currently no disposal restrictions on organic materials nor are there centralized composting facilities within the service area. In comparison to the Terrace Service Area, fewer households receive curbside collection of recyclables, and there is no disposal restriction on ICI cardboard. Therefore, it is anticipated that there are more organics/compostables and recyclables in the waste stream.

#### 3.3.2 Waste Sources

The RDKS has begun recording the source sector for each incoming load in the Hazelton and Highway 37 North Service Area. This information can be used in the future to identify the sectors that require additional support with waste diversion and reduction. Since there is less ICI activity in the Hazelton and Highway 37 North Service Area, it is anticipated that a higher proportion of the waste would be generated by the residential sector.

### 3.4 Comparison to Other Jurisdictions

Per capita disposal rates from a number of other regional districts in British Columbia were collected and compared to the disposal rate in the RDKS. Metro Vancouver and the Capital Regional District were selected because they have long-established diversion programs and plentiful resources for implementation. The Cowichan Valley Regional District was included because it is semi-rural and has had success in implementing effective diversion programs (largely due to limited and expensive landfill disposal options). Bulkley Nechako, Fraser-Fort George and Thompson-Nicola regional districts were chosen based on their distance from recycling markets (similar to the RDKS) and relatively low populations. The results show that there is not a strong correlation between population and disposal rate (i.e. regional districts with small populations can also have low disposal rates).

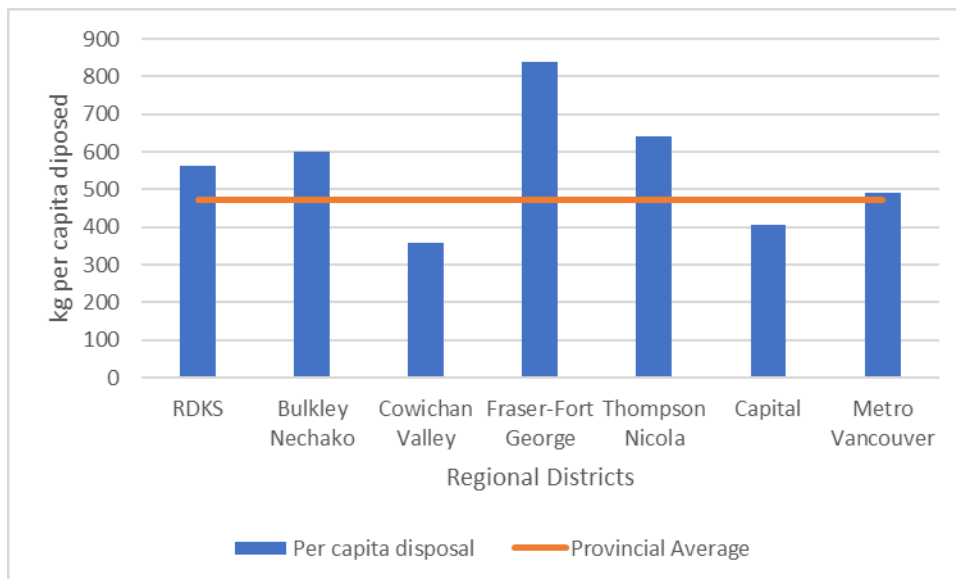


Figure 10. Per Capita Disposal Rates in other BC Regional Districts

## 4 Waste Management System

Waste is generated at a source (e.g. homes and businesses), and travels via various methods to either an intermediate processing facility (e.g. transfer station, composting facility, recycling facility) or directly to its final destination (e.g. landfill, recycling markets). These activities are regulated by bylaws and are supported by communication and education initiatives. The process of waste moving from its source to its final destination is referred to as the “waste flow”, and all of the components of the waste flow are the “waste management system”. Figure 11 illustrates the waste management system in the RDKS.

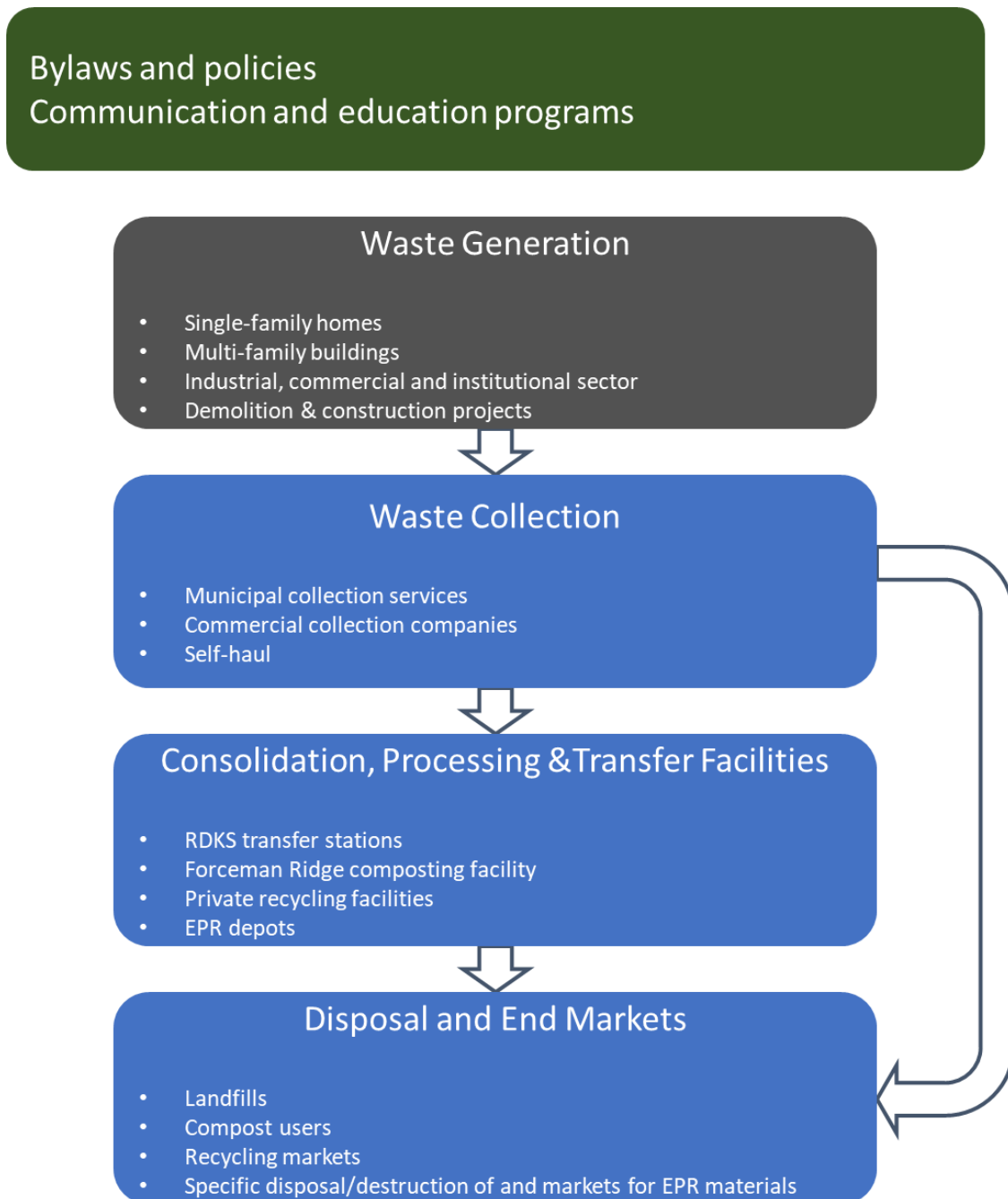


Figure 11. RDKS Waste Management System

The components of the waste management system can also be organized according to the “waste management hierarchy”, which emphasizes the importance of reduction, reuse and recycling before managing the remaining waste by recovering energy (optional) and disposing of the residuals. Figure 12 illustrates the waste management hierarchy. The following section describes each element of the hierarchy in the RDKS.

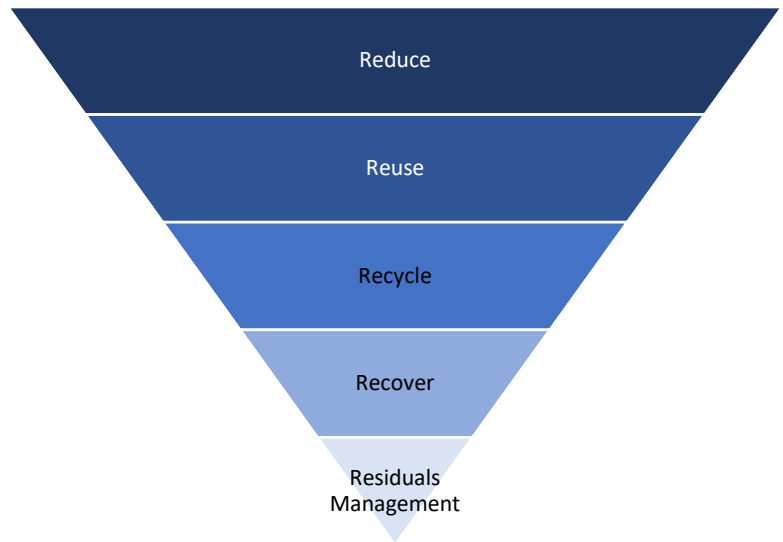


Figure 12. Waste Management Hierarchy

#### 4.1 Reduction and Reuse

Local governments benefit from reducing waste generation and increasing material reuse because those measures result in less waste that needs to be managed by garbage and recycling programs.

The RDKS uses outreach and education programs to encourage waste reduction. Tipping fees on garbage (currently implemented only in the Terrace Service Area) also encourage waste reduction. Tipping fees were implemented for all users in the Terrace Service Area in 2016, and are intended to be implemented for large loads in the Hazelton and Highway 37 North Service Area in the future.

The RDKS supports reuse by waiving tipping fees on unsuitable donations received by thrift stores and by allowing the Salvation Army to store surplus materials and unsellable textile donations in a semi-trailer at the transfer station for no cost (the Salvation Army manages the trailer and sends materials for recycling when the trailer is full).

#### 4.2 Recycling

##### 4.2.1 Residential

The RDKS offers curbside recycling collection to residents outside the City of Terrace and within the Terrace Service Area (Electoral Areas C and E). The City of Terrace and District of New Hazelton also offer curbside recycling collection. All curbside collection programs operate every other week. The curbside program in the City of Terrace is partially funded by Recycle BC<sup>13</sup>, the stewardship organization responsible for managing residential printed paper and packaging (including cardboard, plastic and metal containers). See Section 4.2.3 for more information about product stewardship/EPR programs.

Private companies offer subscription-based collection of residential recycling in areas that are not serviced by local government collection programs. These companies include Geier Waste Services and Waste Management.

There are also depots located throughout the RDKS that accept paper, cardboard, plastic and metal containers from residents. These include the bottle depots in New Hazelton and Kitimat and Do Your Part Recycling in Terrace. Those three depots receive a financial subsidy from Recycle BC, and residents may drop off recyclables for no charge. The RDKS has established a recycling depot at the Kitwanga

<sup>13</sup> Formerly called Multi-Material BC, or MMBC.

Transfer Station and accepts cardboard for recycling at the Hazelton Waste Management Facility, with the goal of eventually securing support from Recycle BC for those services. In December 2018, Border Town Recycling in Stewart ceased operation and the RDKS established a Recycle BC depot at the Stewart landfill (the site of the future transfer station).

#### 4.2.2 Institutional, Commercial and Industrial Sector

The District of Stewart collects cardboard from commercial generators and currently stores it in their public works yard prior to pick-up and delivery to Do-Your-Part recycling depot in Terrace. The RDKS currently pays for the hauling and recycling of ICI cardboard from Stewart. This program is funded through taxation.

The “Kitimat Understanding the Environment” or KUTE depot in Kitimat accepts cardboard and paper from Kitimat industrial projects and camps.

Throughout the rest of the RDKS, collection of recyclables from ICI properties is managed privately. Owners or operators of ICI facilities are responsible for making sure that their garbage does not contain any materials that are restricted from disposal, such as cardboard and paper. They may choose to bring those recyclables to designated facilities themselves, or they may contract out the collection of those materials. Collection services are offered by Geier Waste Services, Waste Management and Do Your Part Recycling. Do Your Part Recycling is the only designated recycling facility for ICI paper and cardboard in the RDKS.

Some businesses choose to backhaul recyclable materials to their central distribution centers located outside the RDKS, rather than recycling locally. This is typically done by large retailers, and no data is available on backhauled quantities.

#### 4.2.3 Extended Producer Responsibility

EPR is an environmental policy approach in which producers are made responsible for managing their products throughout their entire whole life cycle, from selection of materials and design to end-of-life management. Under an EPR scheme, the economic and physical responsibility for products is shifted from local governments to producers. This provides a financial incentive for producers to create products that can be disposed of (or reused/recycled) responsibly.

The Recycling Regulation, under BC’s *Environmental Management Act*, sets out the requirements for EPR programs in BC. The regulation requires producers of designated products to develop a program for their end-of-life collection and management, and to consult stakeholders (including local governments) when developing their plans.

The range of products managed through EPR programs has expanded significantly in the last decade, and now includes standard household recyclables (e.g. paper, cardboard, metal, plastic, and glass) as well as more hazardous materials (e.g. batteries, paint, solvents). EPR materials may be collected curbside and/or at depots and through take-back programs in stores and other strategic locations. “Round-up” events are also a common approach to collecting EPR materials (i.e., household hazardous waste) in less densely populated areas, such as some areas of the RDKS.



Table 5 lists the number of depots operated under contract to each stewardship agency and their locations. Table 4 (Section 3.1) includes the quantity of EPR materials collected in the RDKS, as reported by product stewardship agencies.

Table 5. EPR Depot Locations

Stewardship Agency	Materials managed	Number of Depot Location		
		Terrace	Kitimat	Highway 37 North Service Area
BCUOMA	Used oil, oil containers, oil filters	3	1	1
BCUOMA	Antifreeze	1	0	0
Encorp	Beverage containers	1	1	1
Canadian Battery Association	Lead acid batteries	5	1	1
Call2Recycle/CWTA	Rechargeable batteries and cell phones	10	2	3
EPRA (operated by Encorp)	Electronics: computers, televisions, audio-visual, medical equipment, office equipment	2 (1 retail location accepts residential quantities only)	1	2
LightRecycle	Lamps and lighting equipment	3 (1 is for commercial only)	1	1
OPEIC	Outdoor power equipment	2	0	0
CESA	Small appliances and electrical equipment	1	1	2
AlarmRecycle	Smoke and carbon monoxide detectors	1	1	0
Thermostat Recovery Program	Thermostats	3	0	0
ProductCare (regeneration)	Paint	1	1	2
ProductCare (regeneration)	Solvents, flammable liquids, gasoline and pesticides	1	1	0
Health Products Stewardship Association	Pharmaceuticals	6	3	0
BC Tire Stewardship	Tires	10	2	2
Recycle BC	Residential packaging and printed paper	1 (plus curbside program in Terrace)	1	2

The RDKS is a member of the BC Product Stewardship Council, a body that advocates on behalf of local government for effective EPR programs. RDKS staff also regularly engage in discussions with stewardship agencies to discuss how access to their programs can be improved in the RDKS.

#### 4.2.4 Consolidation, Processing and Marketing of Recyclables

Do Your Part Recycling operates a facility to consolidate, process and transfer recyclables from both the residential and ICI sectors. Do Your Part Recycling receives recyclables from residential curbside

collection programs operated by the City of Terrace (through the Recycle BC program) and the RDKS, private collection from residential and ICI properties, and self-hauled recyclables from residential and ICI customers. Materials covered by the Recycle BC program are kept separate from other materials.

### 4.3 Composting

This section focuses on the Terrace Service Area since there are no composting facilities or accompanying organics collection programs in the Hazelton and Highway 37 North Service Area.

#### 4.3.1 Collection of Organics

The RDKS offers curbside organics collection to residents in the Terrace Service Area who live outside the City of Terrace. The City of Terrace offers curbside organics collection to its residential waste collection customers. Both systems collect mixed organics every week. The City of Terrace also operates a separate collection system for clean yard waste; that collection service is offered weekly from spring to fall.

Collection of organic waste from ICI properties and multi-family buildings is managed privately. Owners or operators of ICI facilities and multi-family buildings are responsible for ensuring their garbage does not contain organics. Private collection contractors collect source-separated organics. For properties that generate very small quantities of organic waste, the preferred solution may be for employees to take their organics home with them and place them in their curbside collection container.

The organic materials collected include cooked and uncooked foods, food soiled paper and yard and garden waste. Organics are marshalled at the Thornhill Transfer Station and hauled to the composting facility at Forceman Ridge.

#### 4.3.2 Composting at the Forceman Ridge Waste Management Facility

The composting facility at the Forceman Ridge Waste Management Facility uses the in-vessel Gore™ cover system. It is capable of processing 4,000 tonnes of organic material per year and producing a Class A finished product. Active piles are housed inside a MegaDome™ structure, and additional curing bays are located outside.

The facility processes organic waste from residential customers in the City of Terrace and RDKS rural collection service area, the ICI sector in the Terrace Service Area, and some industrial work camps. When the organics are received at the facility, they are mixed with materials such as wood chips and branches to achieve ideal ratios of carbon to nitrogen. As each compost heap is built, it is blanketed with a Gore™ cover to keep in moisture, odor and heat. Probes send temperature and moisture information from the compost heap to a computer system that controls airflow in the heaps. Facility operators adjust and turn piles periodically. It takes about 8 weeks to create the finished product.

The Class A compost produced will initially be used in the closure process of the Thornhill Landfill. Eventually it will be used as closure cover for the landfill at the Forceman Ridge Waste Management Facility. Some compost may also be made available to the community for use on community gardens or parks.

#### 4.3.3 City of Terrace Yard Waste Composting

The City of Terrace operates a yard waste composting facility at its public works yard. This facility composts yard waste only (e.g. grass clippings, leaves, smaller twigs,) in windrows that are turned

periodically with machinery. The yard waste is collected from residential properties weekly on a seasonal basis; yard waste must be placed in kraft paper bags and bundles. Since the feedstock is not closely monitored, the quality of the compost is unknown and it is not recommended for use on edible produce. This compost is used by the City in parks and recreation sites and other purposes, and can also be used by the public on lawns.

#### 4.3.4 District of Kitimat Yard Waste Composting

Yard waste (e.g. grass clippings, leaves, smaller twigs,) can be dropped-off at the District of Kitimat landfill for composting. Yard waste is shaped into windrows and turned periodically using machinery. Since the feedstock is not closely monitored, the quality of the compost is unknown and it is not recommended for use on edible produce. Compost can be used by the public on lawns, and by the District of Kitimat as cover for capping Phase 1 of the landfill.

#### 4.4 Recovery

There are no energy recovery facilities in the RDKS.

#### 4.5 Residuals Management

##### 4.5.1 Municipal Waste Collection

The City of Terrace, District of Stewart, Village of Hazelton, and District of New Hazelton provide their residents with curbside collection of garbage.<sup>14</sup> The RDKS provides curbside collection of garbage for residents in most portions of Electoral Areas C and E. Collection in Terrace, Electoral Areas C and E and the District of New Hazelton is biweekly (alternating with recycling). Collection in the District of Stewart and Village of Hazelton is weekly. Most First Nations communities also provide curbside collection of garbage to their residents.

The City of Terrace adopted an automated collection system in 2016. All households are now equipped with 3 carts: one each for garbage, recycling and organics. The garbage and recycling carts have the capacity of 240 liters while the organics carts are 120 liters.

All other programs use manual collection.

##### 4.5.2 Transfer Stations

Once the 1995 SWMP is fully implemented, there will be one transfer station in the Terrace Service Area (Thornhill) and two RDKS transfer stations in the Hazelton and Highway 37 North Service Area (Stewart and Kitwanga). The Stewart Transfer Station is not yet constructed; it is expected to start operations in 2019. A transfer station is also being considered as an option for Telegraph Creek, located in the Hazelton and Highway 37 North Service Area.

The Thornhill Transfer Station opened in November 2016 adjacent to the former Thornhill Landfill. The Thornhill Transfer Station replaces both the Terrace Landfill and the Thornhill Landfill. The Terrace Landfill is no longer accepting waste and the closure design is pending. The Thornhill Landfill is now capped with clay, and vegetation of the surface will be completed over the next year. The Thornhill Transfer Station accepts garbage, construction and demolition waste (loads of 5m<sup>3</sup> or less), land clearing waste (loads of 5m<sup>3</sup> or less), scrap metal, organic materials, and animal carcasses (loads of 50kg or less).

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<sup>14</sup> Collection in the District of Stewart will be changing as the Districts joins the Hazelton and Highway 37 North Service Area.

Large loads of garbage are directed to the tipping building, while large loads of organic materials are directed to the lidded organics bin. The transfer station also includes an area called the Z-wall, which is the public drop off area for depositing smaller quantities of garbage, organics, metal and white goods, clean wood waste, and demolition material. The facility is equipped with weigh scales and charges tipping fees for all loads other than residential collection vehicles operated by the City of Terrace and the RDKS's collection contractor. Garbage, construction and demolition waste, land clearing waste and animal carcasses are all charged \$110.00 per tonne. Metal is charged \$55.00 per tonne and organic materials are charged \$99.00 per tonne. There is a minimum charge of \$10 per load for small loads; over 91kg, the regular rate per tonne applies. Waste is hauled from the transfer station to the Forceman Ridge Waste Management Facility. Consolidating loads at Thornhill the transfer station reduces travel time and traffic to the Forceman Ridge Waste Management Facility by 90%.

The Kitwanga Transfer Station, established in 2017, accepts garbage, loads of 30m<sup>3</sup> or less of construction and demolition waste and land clearing waste, scrap metal, cardboard and paper products originating from commercial premises, packaging and paper products from residential premises, and tires. Garbage, construction and demolition waste, and land clearing waste are transferred to the Hazelton Waste Management Facility. No tipping fees are charged at this time, although volume-based fees may be introduced in the future.

The Stewart Transfer Station will accept garbage, loads of 30m<sup>3</sup> or less of construction and demolition waste and land clearing waste, and scrap metal. Tipping fees will likely be introduced, although the following types of loads will be exempt: garbage from residential premises, loads of 5m<sup>3</sup> or less of garbage or cardboard and paper products from commercial premises, and loads of 5m<sup>3</sup> or less of construction and demolition waste or land clearing waste. Tipping fees will be volume-based. Waste materials collected at the transfer station will be transferred to the Meziadin Landfill for disposal. A Recycling Diversion Center for collection of EPR materials will continue to be operated at the Stewart Transfer Station.

Telegraph Creek is currently working to determine the optimal method for waste management in the community. If a transfer station is built, waste will be sent to the Dease Lake landfill.

#### 4.5.3 Landfills

With the implementation of the 1995 SWMP, there are five active landfills in the RDKS that are owned by the RDKS, and three landfills owned by other entities.

The five landfills owned by the RDKS are the Forceman Ridge Waste Management Facility, the Hazelton Waste Management Facility, the Iskut Landfill, the Meziadin Landfill and the Rosswood Landfill. Each landfill is intended to serve the residents in the immediate geographic area.

Each site is subject to the provincial Landfill Criteria for Municipal Solid Waste as well as site-specific stipulations set forth in its Operational Certificate issued by BC Ministry of Environment. These include common requirements such as an electrified wildlife exclusion fence to keep bears and other animals from gaining access to the site, and daily, weekly and monthly tasks related to care and control of the site, signage requirements and more.

The RDKS oversees each of its waste management facilities and contracts the operations of each site.

Landfills not owned or operated by the RDKS include the District of Kitimat landfill, the Dease Lake Landfill and the New Aiyansh Landfill. If Telegraph Creek chooses to build a new landfill, that facility will also not be owned by the RDKS.

#### *4.5.3.1 Forceman Ridge Waste Management Facility Landfill*

The Forceman Ridge Waste Management Facility opened as a regional waste management facility in November 2016. It serves as the primary location for waste processing and disposal in the Terrace area. The site was selected after exhaustive investigations to ensure the facility could co-exist well with the surrounding environment.

The site is only accessible to contracted operations personnel, RDKS personnel, septage haulers and haulers with loads that have been approved through the Controlled Waste application and permitting process.

The Forceman Ridge Waste Management Facility consists of a compost facility, septage receiving facility, an engineered landfill, and a 5-stage leachate collection and treatment system (including a phytoremediation area).

The engineered landfill is lined with bentonite clay and a geo-synthetic High-Density Polyethylene (HDPE) composite liner with integrated leachate detection systems. This robust system was built as a direct result of stakeholder engagement and feedback, and increases environmental protection compared to simpler systems.

Rather than using soil or gravel for daily cover, an alternative daily cover system called the Revelstoke Iron Grizzly (RIG) (large steel plates) is used. This saves air space, extends the life of the landfill, reduces bird attraction and wind-blown litter, and limits exposure to precipitation (which reduces leachate generation). The landfill will be filled in phases and was designed to last a minimum of 100 years.

#### *4.5.3.2 Rosswood Landfill*

The Rosswood Landfill is located north of Terrace on the Kalum Lake Road and serves the residents of the Rosswood community (defined as the area within a 28.0 km radius from the site). A 25-year Operation Plan was completed in 1999. This landfill uses natural attenuation. This landfill falls within the Terrace Service Area, and as such is covered by the Kitimat-Stikine Terrace Area Waste Management Facility Regulation Bylaw. The facility accepts garbage, loads of 5m<sup>3</sup> or less of construction and demolition waste and land clearing waste, metal, and loads of 50 kg or less of animal carcasses. No tipping fees are charged at this facility, and disposal restrictions are not currently enforced as there are no viable alternatives. The site has an estimated lifespan of 20 years or more under current practices.

#### *4.5.3.3 Hazelton Waste Management Facility*

Phase 2 of the Hazelton Landfill is was completed in 2017, and includes a 4-stage leachate collection and treatment system, with phytoremediation area. The facility receives refuse from the Hazelton community and materials from the Kitwanga Transfer Station. The landfill is unlined as the soils on site meet current landfill criteria.

#### *4.5.3.4 Iskut Landfill*

The Iskut Landfill is relatively small, and services both on-reserve and off-reserve residents of the Iskut area. It is a natural attenuation site. The site is fenced and is accessible only when a site attendant is present.

#### *4.5.3.5 Meziadin Landfill*

The Meziadin Landfill was sited as a result of the 1995 SWMP. It was commissioned in 2001 and designed to accommodate the waste from the District of Stewart. The current cell is equipped with leachate collection and treatment. In addition, the same alternative daily cover system (RIG plates) used at the Forceman Ridge Waste Management was introduced in 2017.

The Meziadin Landfill also receives waste from some industrial camps, conditional on the segregation of organics, paper and cardboard. Tipping fees are charged to these industrial users. Tipping fees will also be introduced at the Meziadin landfill for other users, with the same rate and exemptions as the other facilities in the Hazelton and Highway 37 North Service Area. These fees are expected to be implemented in 2019.

#### *4.5.3.6 District of Kitimat Landfill*

The District of Kitimat owns its own landfill and contracts landfill operations. The Kitimat Landfill is located approximately 5km north of the city, between Highway 37 and Hirsch Creek. The site is subject to an Operation Certificate issued by BC Ministry of Environment. It is not lined, and has no leachate collection or treatment systems. The site is fenced and is covered intermittently. The landfill is expected to reach capacity in 2047, if Kitimat experiences a relatively slow rate of growth and the current diversion rate is maintained.

The landfill accepts most materials for burial. Automobile bodies, scrap metal (including white goods), propane tanks, car tires and automotive batteries are collected separately at the landfill for recycling. Untampered wood is also collected separately and is eventually burned. Yard waste can be dropped off at the landfill for composting.

The District of Kitimat does not charge tipping fees on self-hauled residential waste. Modest tipping fees are charged on commercial loads. Those fees are volume based (e.g. a load between 15 and 30 cubic yards will be charged \$50.00).

#### *4.5.3.7 Dease Lake Landfill*

The Dease Lake Landfill is owned by the Ministry of Transportation and Infrastructure (MOTI) and operated by a private contractor, with support from the local highway contractor. The Dease Lake Landfill receives waste from the surrounding community and may receive waste from Telegraph Creek if a transfer station is built.

The Dease Lake landfill is fenced and gated, but is not lined. A development and fill plan is required.

#### *4.5.3.8 Telegraph Creek Landfill*

This landfill is expected to close and be replaced by another landfill or a transfer station. Residents continue to dispose of waste at the Telegraph Creek Landfill.

#### *4.5.3.9 New Aiyansh Landfill*

The New Aiyansh landfill serves the Nass Valley First Nations communities, as well as some off-reserve residents of RDKS. The RDKS contributes cost sharing funding to the Nisga'a Lisims government for off-reserve users.

#### 4.5.4 Controlled Waste

A Controlled Waste Protocol has been developed to manage the disposal of controlled waste (materials which require special handling and disposal practices to avoid health hazards, nuisances or environmental pollution). The protocol is in effect in the Terrace Service Area and the Hazelton and Highway 37 North Service Area in 2017.

A Controlled Waste Permit Application must be submitted to RDKS Solid Waste Services personnel for approval and issuance of a Controlled Waste permit prior to disposal of Controlled Waste. The permit may include terms and conditions to ensure compliance with the bylaws, the Operational Certificate for the relevant landfill, and any other applicable law or permit. Once a Controlled Waste Permit is issued, an appointment for disposal must be made a minimum of twenty-four hours prior to the disposal. The applicable Controlled Waste Permit must be presented to facility operators upon arrival at the Waste Management Facility. Controlled Waste must be inspected and accepted by site personnel prior to being deposited, and loads of Controlled Waste must be of one type only and from no more than one source unless the Controlled Waste Permit specifies otherwise. Controlled Waste must be kept separate from any other type of Solid Waste.

Controlled Wastes are accepted at the Forceman Ridge Waste Management Facility Landfill, the Meziadin Landfill and the Hazelton Waste Management Facility. A sub-set of Controlled Wastes is accepted at the Iskut Landfill, Stewart Landfill (future transfer station), and Kitwanga Transfer Station. No controlled wastes are accepted the Rosswood Landfill or Thornhill Transfer Station.

#### 4.5.5 Prohibited Waste

The following materials are not accepted for disposal in the Terrace Service Area:

1. Class “A” Prohibited Waste:
  - a. Hazardous Waste;
  - b. Radioactive waste;
  - c. Slaughter Waste;
  - d. Waste that is on fire or smoldering, or any waste material capable of starting fires, and highly flammable material;
  - e. Explosive or highly combustible materials;
  - f. Other Sewage Waste.
2. Class “B” Prohibited Waste:
  - a. Auto hulks;
  - b. Broken concrete 300 millimetres in diameter or greater;
  - c. Broken Asphalt 300 millimetres in diameter or greater.
3. Class “C” Prohibited Waste:
  - a. Extended Producer Responsibility Materials;
  - b. Tires, whether or not they fall within the definition of “Extended Producer Responsibility materials”;
  - c. Cardboard and Paper Products, whether or not they fall within the definition of “Extended Producer Responsibility Materials”.



The following materials are not accepted for disposal in the Hazelton and Highway 37 North Service Area:

4. Class “A” Prohibited Waste:
  - a. Hazardous Waste;
  - b. Radioactive waste;
  - c. Slaughter Waste;
  - d. Waste that is on fire or smoldering, or any waste material capable of starting fires, and highly flammable material;
  - e. Explosive or highly combustible materials;
  - f. Other Sewage Waste;
  - g. Waste that is not Municipal Solid Waste.
5. Class “B” Prohibited Waste:
  - a. Auto hulks;
  - b. Broken concrete 300 millimetres in diameter or greater;
  - c. Broken Asphalt 300 millimetres in diameter or greater.
6. Class “C” Prohibited Waste:
  - a. Extended Producer Responsibility Materials unless classified as a Restricted Waste;
  - b. Organic Materials that originate from Industrial Work Camps or from outside the Service Area;
  - c. Tires that do not fall within the definition of “Extended Producer Responsibility Materials”.

The District of Kitimat Landfill does not allow the following wastes to be buried

1. Explosives;
2. Raw sewage;
3. Highly flammable materials;
4. Dead animals;
5. Hot ashes;
6. Herbicides;
7. Pesticides;
8. Poisons;
9. Waste oil (excluding cooking oil);
10. Toxic wastes;
11. Car tires;
12. Batteries; and
13. Cardboard originating from a Commercial Premises or Residential Premises.

There are no disposal restrictions at the Dease Lake Landfill or the New Aiyansh Landfill.

#### 4.5.6 Illegal Dumping Prevention and Clean Up

The provincially-run BC Conservation Officer Service (CO Service) is mandated to enforce and manage illegal dumping. Various prevention programs are used to deter this behavior ranging from ‘shaming’ programs, workshops, use of cameras and enforcement. The CO Service is responsible for a number of

programs over large geographic areas and often note that insufficient personnel are a barrier to addressing illegal dumping.

The RDKS is currently participating in a Terrace area inter-agency working group to identify solutions and mitigations. In addition to the RDKS, the group includes the BC CO Service, MOTI, the local MOTI Contractor (Nechako Northcoast), Natural Resource Officers, and the Kitsumkalum Resource Officer. The RCMP have also been invited to participate.

The RDKS recognizes efforts made by individuals and groups who clean up litter along roadways or illegal dumping sites. The RDKS reimburses tipping fees for disposal of illegally dumped waste material collected by non-profit organizations. Groups must make a request to the Board in advance of the collection event. The RDKS will also provide bag tags for disposal of illegally dumped material to individuals that provide photos of the site(s) before and after clean up.

#### 4.6 Education and Outreach

Education and outreach play a key role in waste reduction, diversion, and proper disposal of residual waste. The RDKS has made a wide range of waste management information available on its website, including information sheets on each solid waste facility, composting information, how-to guides for ICI recycling and organics collection, and links to various waste management planning initiatives. Staff have been and will continue to be available to provide hands-on guidance, training and conduct community-wide workshops.

The RDKS and its member municipalities also provide information on collection schedules.

The RDKS launched and manages a smart phone app and website plug-in (Recycle Coach app of the “MyWaste™” platform) to provide local information about the recycling program and drop-off locations. Through the app, residents can receive reminders about their collection schedules. The app is also capable of sending out ‘pushed information’ for more immediate or urgent news such as a broken-down collection vehicle, weather-influenced road conditions that affect regular scheduling, reminders of statutory holidays that affect schedules, or special diversion events. Member municipalities can arrange to share addressing information with the RDKS to have their communities included. The service is currently provided to customers in the rural part of the Terrace Service Area, the City of Terrace and the District of New Hazelton.

#### 4.7 Bylaws

This section describes the current regional and municipal bylaws related to solid waste management.

##### 4.7.1 Regional District of Kitimat-Stikine

###### Hazeltons and Stewart Area Solid Waste and Recyclable Material Management Service Establishing Bylaw No. 657, 2015

This bylaw establishes the Hazeltons and Stewart Area Solid Waste and Recyclable Material Management Service.

###### Kitimat-Stikine Terrace Area Solid Waste and Recyclable Material Management Service Establishment Bylaw No. 658, 2015

This bylaw establishes the service of solid waste and recyclable material management for Electoral Areas C and E of the Regional District of Kitimat-Stikine and the City of Terrace.

Kitimat-Stikine Bylaw No. 330 and Bylaw No. 581 Repeal Bylaw No. 659, 2015

This bylaw repeals the Garbage Disposal Local Service Establishment Bylaw No. 330, 1992 and Solid Waste and Recyclable Material Management Service Establishment Amendment Bylaw No. 581, 2010, because they were replaced by the Terrace Area Solid Waste and Recyclable Material Management Service Establishing Bylaw No. 658, 2015, and Hazeltons and Stewart Area Solid Waste and Recyclable Material Management Service Establishing Bylaw No. 657, 2015. This bylaw simply repeals the older bylaws.

Kitimat-Stikine Terrace Area Cardboard and Paper Products Disposal Regulation and Fee Establishment Bylaw No. 670, 2016

This bylaw bans the disposal of cardboard and paper products at the Thornhill Landfill and City of Terrace Landfill, and establishes fees for depositing cardboard and paper products at designated disposal sites. This bylaw was enacted to allow cardboard and paper products from the ICI sector to be directed to a Designated Recycling Facility prior to the effective date of Bylaw 671. Once Bylaw 671 was effective, Bylaw 670 was no longer necessary.

Kitimat-Stikine Terrace Area Waste Management Facility Regulation Bylaw No. 671, 2016

This bylaw outlines the operations of waste management facilities in the Terrace Service Area, including facility use regulations, acceptable types of waste, and payment terms for use of the facilities.

Kitimat-Stikine Terrace Area Solid Waste and Recycling Collection Service Rates and Regulations Bylaw No. 674, 2016

This bylaw describes the collection service provided by the RDKS in the Terrace Service Area, including the types of properties included in the service, collection frequency, types of materials collected, handling of waste and containers, the container assistance program, the medical waste exemption programs, and the cost.

Kitimat-Stikine Terrace Area Waste Management Facility Regulation Amendment Bylaw No. 682, 2016

This bylaw amends bylaw 671 by prohibiting anything other than cardboard and paper products being taken to the Designated Recycling Facility (Schedule H) and adding a penalty for doing so (Schedule G). The amendment also replaces the tipping fee schedule with one based on weight (rather than volume) for the Forceman Ridge Waste Management Facility.

Kitimat-Stikine Hazelton and Highway 37 North Area Waste Management Facility Regulation Bylaw No. 688, 2017

This bylaw will establish the fees and regulations for the deposit of waste at the Regional District's Hazelton and Highway 37 North Area Waste Management Facilities. These facilities include the Hazelton Waste Management Facility, the Iskut Landfill, the Kitwanga Transfer Station, the Meziadin Landfill, and the Stewart Transfer Station. This bylaw is similar to Bylaw 671, in that it regulates facility access, acceptable types of waste, and payment terms for use of the facilities. This bylaw received three readings by the RDKS Board in March 2017, and is awaiting approval by the Ministry of Environment before it can be adopted by the RDKS Board.

4.7.2 City of Terrace

City of Terrace Bylaw No. 2130 – 2017 Bylaw of the City of Terrace to Establish and Maintain a System for Collection and Disposal of Solid Waste

This bylaw describes the collection service provided by the City of Terrace to residential properties,

including refuse, recycling, organics, and yard waste. The bylaw describes the carts that the City provided to each eligible residential unit (240 litre refuse cart, a 240 litre recycling cart, and a 120 litre organics cart), how carts are to be positioned and how wastes are to be prepared, frequency of collection, the medical waste exemption program, charges, penalties, and the responsibilities of owners of commercial and multi-family premises.

#### 4.7.3 District of Kitimat

##### Kitimat Municipal Code Part 7 Division 2: Refuse Control

This section of Kitimat's Municipal Code covers the collection service provided by the District of Kitimat and use of the District of Kitimat's disposal site, including fees and prohibited materials.

#### 4.7.4 Village of Hazelton

##### Garbage Collection Regulation and Rates Bylaw No. 433, 2006

This bylaw describes the collection service provided by the Village of Hazelton. The service is provided weekly to residential and non-residential properties.

##### Garbage Collection Regulation and Rates Amendment Bylaw No. 465, 2014

This bylaw amends the rates charged for garbage collection.

#### 4.7.5 District of New Hazelton

##### District of New Hazelton Bylaw No. 329, 2016

This bylaw describes the garbage and recycling collection service provided by the District of New Hazelton to residential properties within its boundaries. The bylaw specifies collection frequency, types of materials collected, handling of waste and containers, and the cost.

#### 4.7.6 District of Stewart

##### District of Stewart Solid Waste Bylaw No. 875, 2015

This bylaw establishes the solid waste collection service in the District of Stewart and regulates, prohibits and imposes requirements in relation to that service. Collection is provided to single family dwellings/duplexes, multi-family dwellings and businesses. The bylaw also describes how the salvaging program works at the landfill.

### 4.8 Provincial Policies and Legislation

Solid waste management is regulated by the Province of British Columbia. Some legislation assigns responsibility for different aspects of waste management to other entities (e.g. regional districts and product stewardship organizations). Regulations describe how waste management facilities are required to operate. The legislation and regulations are described below.

#### 4.8.1 Environmental Management Act

The *Environmental Management Act* is the key piece of legislation that governs the management of waste in British Columbia. The act provides the authority for waste to be introduced into the environment in a manner that protects human health and the environment (e.g. landfilling with appropriate controls). The act enables the use of permits, regulations and codes of practice to authorize discharges to the environment and enforcement options to encourage compliance.

#### 4.8.2 Recycling Regulation

This regulation is the foundation for British Columbia's EPR programs. It requires producers of designated products to develop programs for the end-of-life collection, recovery and management of materials, and to consult stakeholders when developing those programs. The list of designated products currently includes most beverage containers, most household hazardous waste, and household goods powered by electricity and batteries.

#### 4.8.3 Open Burning Smoke Control Regulation

The intent of the regulation is to reduce smoke emissions and impacts without requiring an Air Emission Permit. This regulation applies to fires that may be lit for purposes such as land clearing, silviculture, forestry, wildlife habitat enhancement, and domestic range improvement. The regulation outlines when and how open burning can occur. This regulation is currently under review.

#### 4.8.4 Organic Matter Recycling Regulation

This regulation governs the production of compost, the quality of compost and the land application of certain types of organic matter (including compost). It provides guidance for compost producers on process requirements to protect the quality of soil and drinking water. This regulation is currently under review.

#### 4.8.5 Landfill Criteria for Municipal Solid Waste

Lateral and vertical expansions of existing landfills and new landfills designed and constructed for the disposal of MSW are subject to the Landfill Criteria for Municipal Solid Waste. These criteria are currently under review.

The criteria are supplemented by the Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills. The guidelines are intended to assist landfill owners and operators design and implement an environmental monitoring program for groundwater and surface water as required by the Landfill Criteria for Municipal Solid Waste.

#### 4.8.6 Landfill Gas Management Regulation

The Landfill Gas Management Regulation applies to all regulated landfill sites that:

- Have 100,000 tonnes or more of municipal solid waste in place, or
- Receive 10,000 or more tonnes of municipal solid waste for disposal into the landfill site in any calendar year after 2008.

This regulation requires owners of applicable landfills to conduct an initial landfill gas (LFG) generation assessment. Based on the outcome of that assessment, a landfill gas management design plan may be required for the landfill site. Once the design plan is accepted by the Province, the owner of the landfill is required to install the appropriate landfill gas management facilities.

## 5 External trends affecting solid waste management

### 5.1 Expanded Extended Producer Responsibility Programs

The Canada-Wide Action Plan for Extended Producer Responsibility was published in 1999. The plan included two phases for increasing the number of products covered by EPR programs. The products covered by Phase 1 are now all covered by EPR programs in BC. The products in Phase 2 are not yet covered by EPR programs in BC. Phase 2 products include construction and demolition materials, furniture, textiles, and carpet. The BC government service plan<sup>15</sup> had a target of having 95% of the sub-categories of materials in the action plan covered by industry-led recycling programs by 2017/2018. While the target was not achieved in the specified timeframe, the RDKS should remain aware of the potential for those material streams to be covered by EPR programs. EPR programs could provide funding to the RDKS for managing those products, or could result in a significant decrease in the quantity of material brought to RDKS facilities (which in turn would reduce tipping fee revenue in the Terrace Service Area). A study conducted for Metro Vancouver on the economic and environmental impacts of EPR programs<sup>16</sup> was unable to comment on the most likely funding mechanisms for EPR programs for Phase 2 products, and to date the Ministry of Environment has not released any details on the plans for Phase 2 products.

### 5.2 Markets for Recyclables

The RDKS is relatively well protected from market risk associated with selling recyclables. The RDKS pays for the processing and marketing of recyclables collected from residential properties in Electoral Area C, and the net cost of those services will rise if market prices drop. The RDKS pays the recycling processor a rate per tonne of cardboard and paper received from the ICI sector, and receives 50% of the revenue from the sale of the material; if the market drops, the share of revenue will decline, and the processor may seek to renegotiate the processing fee.

### 5.3 Rate of Growth in the RDKS

The RDKS will be home to major industrial projects over the duration of the new SWMP. Major projects may impact the quantity of waste generated (i.e., construction waste and camp-generated waste).

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<sup>15</sup> <http://www.bcbudget.gov.bc.ca/2014/sp/pdf/ministry/env.pdf>

<sup>16</sup> <http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/AssesmentEconEnvImpactsEPRPrograms-Feb2014.pdf>

## 6 Cost Recovery Model

Each service area operates with its own cost recovery model.

In the Terrace Service Area, the goal is for costs to be covered evenly by taxes and tipping fees. Costs are allocated as show in Table 6. Based on data from the first full year of operations, tipping fee revenue is less than anticipated.

*Table 6. Terrace Service Area Refuse Function Cost Model (2017 Data)*

Total Cost of the Terrace Area Refuse Function	\$2,782,000
Anticipated tipping fee revenue (50% of total)	\$1,391,000
Requisition (50% of total)	\$1,391,000
Portion of requisition allocated to participating jurisdictions based on their population	\$695,500
Portion of requisition allocated to participating jurisdictions based on the assessed value of improvements in the jurisdiction	\$695,500

The above model applies to the City of Terrace, Electoral Area C and Electoral Area E. The taxes paid by households and commercial premises in those jurisdictions include a line item for the refuse function. Kitselas and Kitsumkalum are also part of the function, and pay solely on the basis of their population; those funds are considered contributions to the tipping fee portion of the cost, rather than the requisition portion.

In the Hazelton and Highway 37 North Service Area, the goal is for costs to be primarily covered by taxes, with tipping fees used to cover the cost of managing unusually large loads of garbage. Taxes are calculated based on the population of each participating jurisdiction and on the assessed value of both land and improvements (except for First Nations, whose contribution is based on population only). Participating jurisdictions include the District of New Hazelton, the Village of Hazelton, the District of Stewart, and Electoral Areas A, B and D. Participating First Nations are: Gitsegukla, Kitwangak, Gitanyow, Gitanmaax, Hagwilget, Moricetown, Kispiox and Glen Vowel.

The 2018 requisition amount in the Hazelton and Highway 37 North Service Area is \$1.176 million, and the tipping fees are budgeted to be \$375,000. A \$1,176,825 tax requisition would result in a net residential tax rate in participating jurisdictions in the order of \$0.62/\$1000 assessed value. The total contribution from First Nations would be \$474,090.

## 7 Assessment

The assessment of the current system should address the following question:

- Has the existing plan been implemented as expected?
- Is the region on track to meet the targets it set previously?
- Are there information gaps to be filled?
- What are the strengths of the existing system (what is working well and should be retained / enhanced in the future)?
- What are the areas for improvement in the existing system (what is not working well and needs improvement or a new approach)?

A report completed in January 2017 and Table 2 of the Step 1 Memo both document the implementation of the 1995 SWMP. The actions of the 1995 SWMP are largely complete and/or ongoing.

The target of the 1995 SWMP was to achieve a 33% diversion rate by the year 2000. Based on available data, this was not achieved due to the time required to site and develop the Forceman Ridge Waste Management Facility and the accompanying diversion programs. Preliminary data from the new system in the Terrace Service Area indicates that the diversion rate in that area is now approaching the target.

There are information gaps to be filled, and systems are now in place to prevent those gaps in the future.

Table 7 provides a preliminary assessment of the strengths and weaknesses of the current system. The assessment was conducted in collaboration with the Plan Monitoring Advisory Committee and Administration.

*Table 7. RDKS System Strengths and Weaknesses*

Component	Specific Weaknesses	Specific Strengths	Overall Assessment
Data and Tracking	There is incomplete data about the amount of waste disposed and diverted.	Scales at the Thornhill Transfer Station, Forceman Ridge Waste Management Facility and the Designated Recycling Facility will provide better data in the Terrace Service Area.  Annual surveys of the landfills in the Hazelton and Highway 37 North Service Area will permit the volume of waste disposed to be estimated (tonnage will be calculated using a conversion factor).	New infrastructure and programs should address historic weakness in statistical data and reporting.
Waste Reduction	The overall amount of waste thrown away has likely not decreased (although it is difficult to know for certain without better data).	Tipping fees are now being charged on all waste streams (garbage, recyclables and organics) in the Terrace Service Area, which should provide an incentive to reduce the amount of waste produced. Tipping fees may be introduced in the Hazelton and Highway 37 North Service Area on large loads.	Ongoing education and consistent application of tipping fees should contribute to waste reduction.



Engagement	Residents and businesses may be “burnt out” with engagement on solid waste	Active PMAC and good engagement during implementation of 1995 SWMP.	RDKS is committed to engagement during new plan development.
<b>Component</b>	<b>Specific Weaknesses</b>	<b>Specific Strengths</b>	<b>Overall Assessment</b>
Waste collection	Not all households receive curbside waste collection service	Good uptake of RDKS collection service in greater Terrace area. Collections and processing infrastructure has improved to meet needs.	Need to determine willingness to pay for collection in other areas of RDKS.
Waste Diversion	The calculated diversion rate is very low.  There is a heavy dependence on a single recycling facility in the Terrace area; if this facility ceases operation, diversion rates would be affected.	New disposal restrictions should result in higher diversion rates.  The RDKS pays the recycling processor and shares revenue, which reduces risk to the processor and should provide more stability.  RDKS has installed diversion infrastructure in areas not serviced by Recycle BC.	Disposal restrictions need to be enforced consistently at the curb and at disposal facilities for disposal restrictions to be effective at increasing the diversion rate.  RDKS needs to continue to lobby Recycle BC for inclusion in program.
Residuals Management	Final plans needed for Telegraph Creek and Stewart.  Contractors at new facilities need to become more reliable.	Replacement of two older landfills with one state-of-the-art facility in the Terrace Service Area, and upgrades to the Hazelton Waste Management Facility represent major improvements in residuals management.	Hours of operation of all facilities should be closely monitored to ensure that open hours match the desired usage times as closely as possible. The final closure of the Thornhill, Terrace, Kitwanga, and Stewart landfills needs to be completed.
Illegal dumping	Incidence of illegal dumping have increased.	Working group has convened.	Need a comprehensive strategy
Finance		New tipping fee schedule in the Terrace Service Area targets 50% of funding to come from tipping fees.	A plan needs to be developed for the Terrace Service Area that addresses what to do if the tipping fees exceed or fall short of projections.