



SOLID WASTE MANAGEMENT PLAN UPDATE

AMENDMENT 4



October 17, 2018
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EXECUTIVE SUMMARY

In British Columbia, regional districts develop municipal solid waste management plans (SWMPs) under the provincial *Environmental Management Act*. This plan, an update of the one prepared in 2006, provides a long-term vision of how the Cowichan Valley Regional District (CVRD) will manage its solid waste and will serve to guide the solid waste management related activities and policy development in the CVRD for the next 10 years.

The key issues for developing this plan emerged through a system analysis located in Section 2.0 Background and ongoing discussions with the technical team and PAC. This assessment was informed by the guiding principles, pollution prevention hierarchy, and targets listed in Sections 1.1 and 1.2 respectively. The intent of the SWMP Update strategies is to reduce the disposal rate from the current 358 kg per capita to the disposal rate target of 250 kg per capita, based on the diversion potential identified by sector and material type in Section 3.5 Resulting Diversion Potential.

Options were developed and refined into strategies that are detailed in Section 3.0. This SWMP Update also provides Plan monitoring and measurement parameters (Section 4.0), Finance and Administrative (Section 5.0), and a proposed Plan Schedule (Section 6.0).

The key issues and corresponding strategies are summarized below.

KEY ISSUES

1. There is currently insufficient programming, including implementation of behaviour change programs, to support the first levels of the pollution prevention hierarchy including rethink, reduce and reuse initiatives;
2. The Industrial, Commercial and Institutional (ICI) and multi-family residential sectors have relatively low diversion rates;
3. In some areas in the CVRD, residents have reduced access to recycling and other collection services that optimize residential waste reduction efforts;
4. There are several organic processing facilities in the CVRD, but some are generating odours that are significantly impacting residents and businesses;
5. There is no transfer or processing capacity for comingled ICI recyclable materials in the CVRD and this material is typically hauled out-of-region in packer trucks (vs. long haul transfer);
6. Despite related disposal bans, there is still a significant portion of Construction and Demolition (C&D) materials in the garbage. There is also limited disposal capacity for hazardous C&D materials (e.g., asbestos containing materials);
7. As there is no local disposal capacity in the CVRD, solid waste is exported to private landfills out-of-region. The CVRD has one of the highest tipping fees and disposal costs in British Columbia;
8. Illegal dumping of materials occurs throughout the CVRD;
9. The CVRD currently has no depot drop-off options for residents to safely dispose of household hazardous liquids, which are not managed by an extended producer responsibility (EPR) program. Bulky items, such as furniture and mattresses, are also difficult to dispose of and may contribute to illegal dumping;
10. The CVRD has a number of closed disposal sites that continue to require ongoing monitoring and attention;

11. The CVRD is developing an asset management program. Asset inventories and condition assessments have recently been completed for the Bings Creek and Peerless Road facilities and require implementation;
12. The CVRD currently does not have a disaster management plan for solid waste in the event of a natural disaster; and
13. Many of the strategies outlined would require CVRD residents to change their behaviour. To be successful, these strategies would require education and behaviour change programs to consider and adopt best practices.

The following programs and policies are recommended for implementation over the next 10 years. The strategies are split into four categories:

1. Improve Waste Reduction and Diversion;
2. Support Transport and Processing Infrastructure;
3. Improve Recovery and Residuals Management; and
4. Support System Resilience.

The strategies are intended to:

- Meet provincial regulations and goals;
- Align with requirement of RecycleBC and other contractual agreements;
- Meet Health and Safety requirements;
- Protect the environment and promote sustainability; and
- Move towards the goal of Zero Waste.

The full strategy list is provided below.

IMPROVE WASTE REDUCTION AND DIVERSION

Strategy 1: Enhance Reduce and Reuse Potential

- A. Reduce Wasted Food from Residential and Industrial, Commercial, and Institutional Sectors
 - i. Promote residential food waste reduction through adoption of food waste prevention campaign
 - ii. Support development of food rescue capacity within region
- B. Enhance and Improve Local Reuse Opportunities
 - i. Continue to explore further reduce and reuse opportunities
- C. Support Bans on Single-Use Plastic Bags or Other Single-Use Items
 - i. Adopt single-use plastic reduction policy and share with member municipal governments and UBCM

D. Advocate for Expansion of EPR Programs

- i. Continue advocacy work to Provincial government for expansion of EPR programs

Strategy 2: Reduce Disposal from ICI and Multi-Family Residential

A. Mandate Source Separation for ICI and Multi-Family

- i. Support development of bylaws and policies mandating source separation for ICI sector and multi-family residential

B. Adopt a Full Organics Disposal Ban and Enhance Enforcement of Existing Material Disposal Bans

- i. Adopt an organics disposal ban at the CVRD transfer station and enhance enforcement of existing material bans.

Strategy 3: Reduce Disposal from Residential Sector

A. Assess Opportunities for Access to Recycling Programs at Depots

- i. Evaluate opportunities to increase accessibility for public depots
- ii. Continue to assess depot service levels for the south end

B. Adopt Universal Curbside Collection Services Across the Region

- i. Adopt universal curbside collection services across the region

SUPPORT TRANSPORT AND PROCESSING INFRASTRUCTURE

Strategy 4: Improve Organics Processing

A. Ensure Best Management Practices for Odour Management

- i. Ensure use of best management practices for odour management

B. Ensure Capacity for Local Organics Processing

- i. Continue to assess demand and capacity for organics processing, assess and accommodate emerging technologies and ensure effective end markets for final products before residuals disposal

Strategy 5: Investigate Processing and Transfer Capacity for ICI Recyclables

A. Perform a Feasibility Assessment for Development of ICI Transfer Capacity

- i. Assess gaps and recommend further opportunities for ICI transfer capacity and processing within the CVRD

Strategy 6: Improve Management of Construction and Demolition (C&D) Materials

A. Monitor C&D Disposal and Recycling Activities in the Region

- i. Conduct C&D waste system analysis to identify issues, opportunities and gaps

- B. Develop a C&D Waste Management Strategy
 - i. Develop a C&D waste management strategy for the region
- C. Reduce Barriers to Disposing Hazardous Materials (asbestos, gypsum wallboard)
 - i. Assess options and prepare business case for different residential hazardous waste disposal options, e.g. cost subsidy for pre-1990 residential gypsum wallboard

IMPROVE RECOVERY AND RESIDUALS MANAGEMENT

Strategy 7: Explore Options for Local Disposal

- A. Explore Options for Local Disposal
 - i. Review feasibility of alternative disposal options
 - ii. Review feasibility of additional alternative disposal options
- B. Explore and Amend Tipping Fee
 - i. Review tipping fee in concert with consideration of future disposal options and update if needed

Strategy 8: Reduce Illegal Dumping

- A. Augment Illegal Dumping Prevention Strategies
 - i. Continue to assess and track illegal dumping activities, support volunteers and non-profit organizations for clean-up activities
 - ii. Implement multi-year illegal dumping education program using community-based social marketing (CBSM) and develop reporting program
- B. Explore and Amend Tipping Fee
 - i. Review and update tipping fee in concert with consideration of future disposal options

Strategy 9: Implement Collection/Drop off for Household Hazardous Waste (HHW), Bulky Items and Organic Debris

- A. Introduce Collection for HHW
 - i. Develop collection program(s) for residential unlabelled liquid HHW
- B. Improve Recycling Opportunities for Bulky Items
 - i. Assess options to support recycling of bulky items and prepare business case, e.g. subsidized annual collection of mattresses at Bings Creek
- C. Assess Effective Ways to Reduce Open Burning of Wood Waste
 - i. Identify and assess feasibility of options for reducing open burning of wood waste

Strategy 10: Monitor Historic Disposal Sites

- A. Monitor Historic Disposal Sites
 - i. Continue to monitor closed landfill (including ash landfill) sites as required by the Ministry of Environment and Climate Change Strategy; remediate outstanding contamination for CVRD-owned or leased sites as necessary

SUPPORT SYSTEM RESILIENCE**Strategy 11: Implement Asset Management Plan**

- A. Implement Asset Management Plan
 - i. Implement asset management plans at CVRD solid waste facilities
- B. Develop Bings Creek Transfer Station 10-Year Plan
 - i. Develop a ten-year site management plan for the Bings Creek Solid Waste Management Facility

Strategy 12: Develop a Disaster Management Plan

- A. Develop a Disaster Management Plan
 - i. Develop a disaster management plan for solid waste services and infrastructure, as part of the corporate Disaster Management Plan

Strategy 13: Integrate Education and Behaviour Change Best Practices

- A. Consider Best Management Practices for Education and Behaviour Change Programs
 - i. Continue to assess and incorporate principles of community-based social marketing (CBSM) into existing and new education and outreach programs as necessary.
- B. Continue to support and encourage recycling education through ongoing promotion of Zero Waste Events program

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ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
AVICC	Association of Vancouver Island Coastal Communities
2006 SWMP	Cowichan Valley Regional District 2006 Solid Waste Management Plan
BCPSC	British Columbia Product Stewardship Council
Bings Creek	Bings Creek Recycling Centre & Garbage Drop-Off Depot/Transfer Station
C&D	Construction and demolition
CBSM	Community-Based Social Marketing
CCME	Canadian Council of Ministers of the Environment
Curbside Service	Collection of disposed or recycled materials from residents' homes at fixed intervals (e.g., weekly)
CVRD	Cowichan Valley Regional District
DO	Drop-off
Duncan	City of Duncan
EPR	Extended Producer Responsibility
Ladysmith	Town of Ladysmith
Lake Cowichan	Town of Lake Cowichan
Meade Creek	Meade Creek Recycling Centre & Garbage Drop-Off Depot
MF	Multi-family
Ministry	British Columbia Ministry of Environment and Climate Change Strategy
MRF	Materials Recycling Facility
MSW	Municipal solid waste
MTSA	Municipal Type Service Agreement
North Cowichan	District of North Cowichan
PAC	Plan Advisory Committee
Peerless Road	Peerless Road Recycling Centre & Garbage Drop-Off Depot
Plan	Solid Waste Management Plan
R	The 5 "R"s of the Pollution Prevention Hierarchy: reduce, reuse, recycle, recover, residuals management
RD	Regional District
Recycling Centres	Refers to Bings Creek, Meade Creek, and Peerless Road
SF	Single family
SWMP	Solid Waste Management Plan

LIMITATIONS OF REPORT

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1.0 INTRODUCTION

In British Columbia, regional districts develop solid waste management plans under the provincial *Environmental Management Act*. Regional districts are modeled as a federation composed of municipalities and electoral areas, each of which has representation on the regional board. Solid waste management plans are long term visions of how each regional district would like to manage its solid waste in accordance with the pollution prevention hierarchy. This plan will be renewed on a 10-year cycle to ensure that it reflects the current needs of Cowichan Valley Regional District (CVRD) as well as current market conditions, technologies and regulations.

This Solid Waste Management Plan Update (SWMP Update) document represents an update of the CVRD's 2006 solid waste management plan (2006 SWMP) and once it is approved by the Province (along with any approval conditions), it becomes a regulatory document for solid waste management and serves to guide the solid waste management related activities and policy development in the CVRD. In conjunction with regulations and operational certificates that may apply, this plan regulates the operation of sites and facilities that make up the region's waste management system.

1.1 Guiding Principles

A SWMP provides regional districts – and their residents and businesses – clear direction on how they will achieve their solid waste goals. The province has provided eight guiding principles in their planning guide, entitled, “A Guide to Solid Waste Management Planning, September 2016” (Guide). As per the British Columbia Ministry of Environment and Climate Change Strategy's (Ministry's) Guide, the CVRD's Plan Advisory Committee (PAC), was consulted to adapt the provincial principles with minor amendments as locally appropriate.

The second, third, fourth, and eighth principle from the Provincial Guiding Principles changed as follows:

- The second guiding principle, related to the pollution prevention hierarchy, was modified to emphasize that when the first 3 Rs cannot be pursued, Recovery (the 4th 'R') will be prioritized over Residuals Management (the 5th 'R');
- In the third guiding principle, “Waste materials” was changed to “discarded materials” to reflect the CVRD's desire to move towards thinking of discarded materials as a resource rather than as “waste”;
- The fourth guiding principal, related to structural and system changes, had a behaviour change component added to reinforce the importance of education to support compliance; and
- The eighth guiding principle, related to a level playing field, was changed to include that the provision of waste management services would be supported whether the services were delivered by public or private service providers, provided that the services delivered were practical and effective.

The CVRD guiding principles are presented on Figure 1-1.

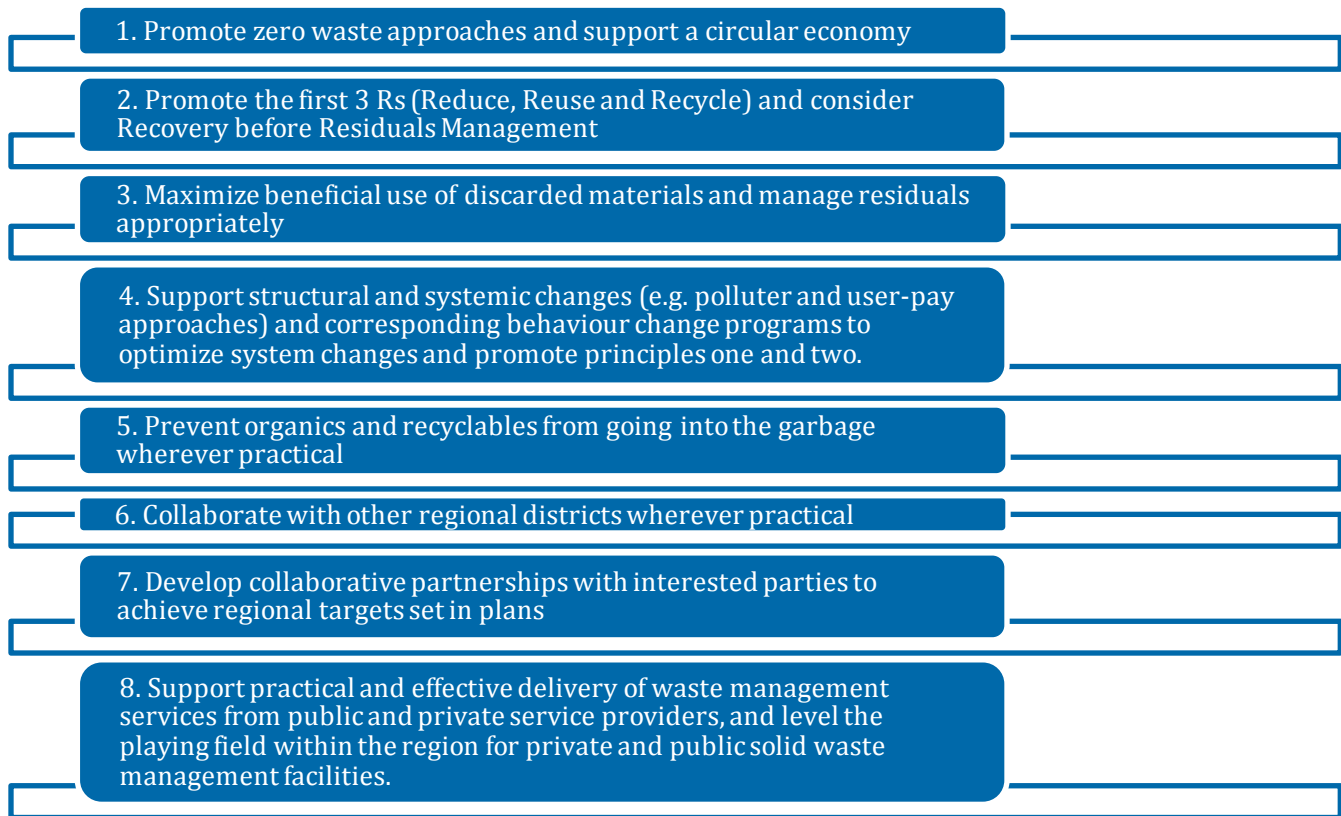


Figure 1-1: Cowichan Valley Regional District Guiding Principles for the 2018 SWMP Update

1.2 Pollution Prevention Hierarchy and Targets

This plan adopts the 5 R pollution prevention hierarchy as illustrated on Figure 1-2. The Plan's proposed strategies and actions are laid out in Section 3.0 and are presented in the order of the hierarchy: reduce, reuse, recycle, recover, and residuals management.



Figure 1-2: Pollution Prevention Hierarchy

Source: (BC Ministry of Environment and Climate Change Strategy, n.d.)

In 2017, an estimated 30,608 tonnes of waste were disposed from within the region. The total amount of materials recycled (including organic materials) was approximately 44,000 tonnes based on reported numbers from in-region depots.

The 2017 CVRD disposal rate was 358 kg per capita. The successful implementation of the strategies in this Plan will significantly reduce this disposal rate and move the CVRD toward a goal of Zero Waste.

Zero Waste is a visionary goal intended to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste means moving towards a circular economy, wherein 'waste' is viewed as a resource, and maximum value is extracted from all resources before they are eventually recovered or regenerated¹.

A Zero Waste goal suggests a move towards the systematic redesign and management of products and processes to avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. The ultimate realization of Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.²

The long-term target (2040) associated with the implementation of the proposed strategies is 150 kg per capita. This visionary target means that virtually all possible recyclable material would be removed from the waste stream. The CVRD is a progressive community with one of the lowest per capita disposal rates in North America; a drop from 358 kg per capita to 150 kg per capita would put the CVRD in line with world leaders in low disposal rates – case studies from zero waste communities in Italy suggest that this is an ambitious, achievable goal.

¹WRAP UK, <http://www.wrap.org.uk/about-us/about/wrap-and-circular-economy>

² Zero Waste International Alliance, <http://zw.ia.org/standards/zw-definition/>

The CVRD is a higher performer relative to Vancouver Island communities overall, based on the November 2017 Association of Vancouver Island Coastal Communities (AVICC) data update shown on Figure 1-3. Given the CVRD does not have an in-region landfill or other local disposal option, reducing and diverting waste is even more critical.

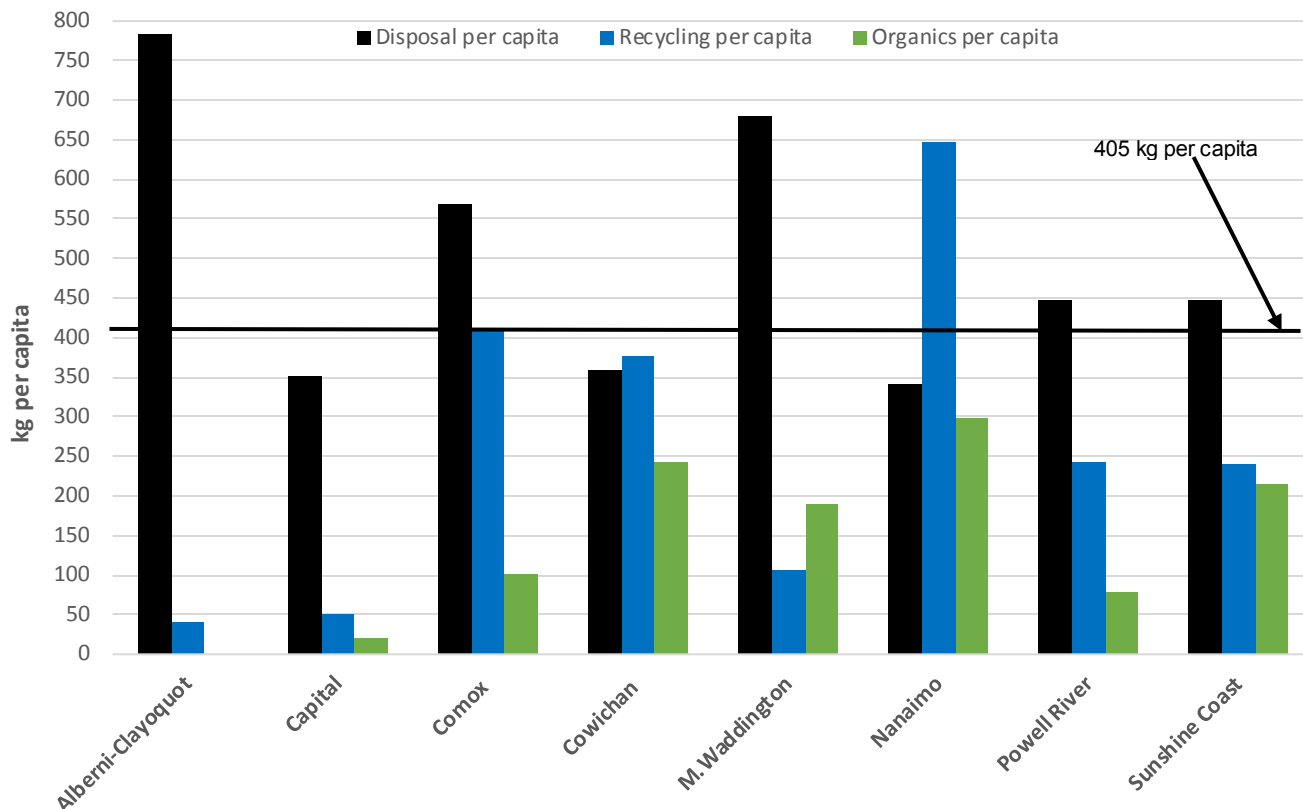


Figure 1-3: Vancouver Island Regional Districts - Per Capita Disposal, Recycling, and Organics Diversion

This Plan lays out strategies for the CVRD's solid waste management practices over the next 10 years. The implementation of these proposed strategies and actions over a 10-year timeframe is expected to reduce the annual per person disposal rate from 358 kg per capita to 250 kg per capita, through a phased approach.

Phasing implementation will optimize existing and implement new waste reduction and diversion programs with the capacity to reduce disposal per capita.

The disposal targets associated with the phased approach are all laid out in Table 1-1. Targets outlined in the Plan, including interim targets, all exceed the Ministry's goal of 350 kg per capita by 2020.

Table 1-1: CVRD SWMP Update Targets

Type	Target Year	Per Capita Disposal Rate	Strategies Involved
Interim Target	2023 (5-year target)	280 kg/capita disposal rate	Implementation of Strategies 1-3 (waste reduction, ICI and residential systems with disposal ban)
SWMP Update Target	2028 (10 year)	250 kg/capita disposal rate	Optimization of Strategies 1-3 (system usage, disposal ban enforcement, and remaining strategies addressed to ensure system resilience)
Long Term Target – Zero Waste Community	2040	150 kg/capita disposal rate	Continued system and behaviour change improvements

Additionally, the Ministry set a target to have 75% of the population in British Columbia covered by an organic waste disposal restriction by 2020. Through the Recycling Regulation, the Ministry oversees an Extended Producer Responsibility (EPR) program that sets 75% recovery targets for products covered through the program (e.g., beverage containers, packaging and printed paper, electronics, and other items).

1.3 The Plan Update Process

The process to review and update the SWMP involves four steps, outlined in Figure 1-4. The first step included two components; the establishment of the PAC to assist in the plan review and update and an assessment of the current system and a report on the implementation status of the 2006 SWMP to develop a long and short list of options for consideration in the 2018 SWMP Update. The second step was a detailed analysis and evaluation of priority options and developing and writing the 2018 SWMP Update.

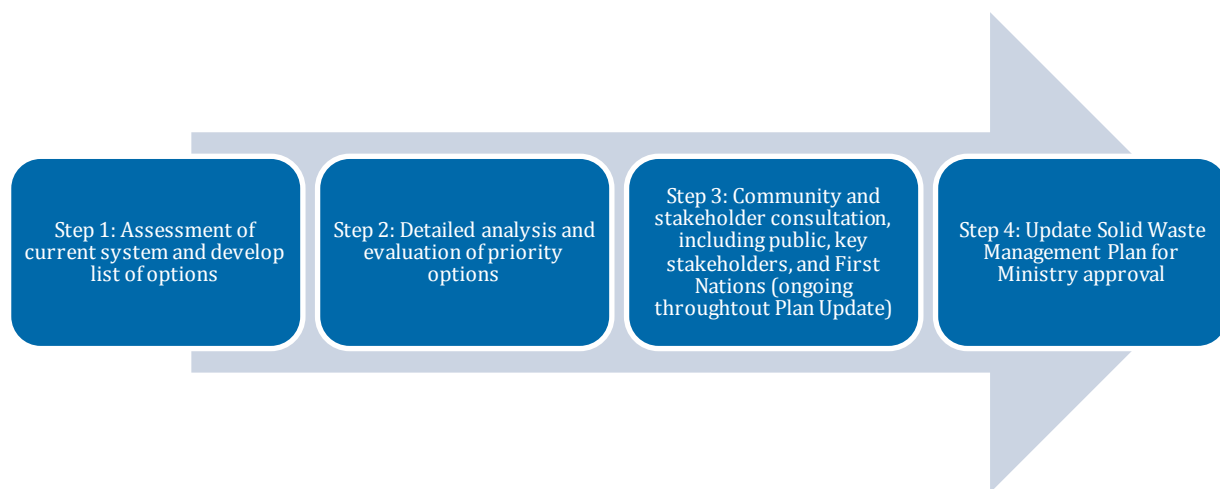


Figure 1-4: Steps of Plan Update

The third step, which has taken place throughout the Plan Update process, is completion of a community and stakeholder consultation process to engage the public, key stakeholders such as industry representatives, and First Nations to provide input on the selected options. The fourth step will be to finalize the 2018 SWMP Update for submission to the Ministry for approval.

Several reports, as listed below, were prepared by the consultants to assist the PAC with their deliberations.

These documents are available on the solid waste management page of the CVRD's website (<https://www.cvr.bc.ca/2979/Solid-Waste-Management-Plan>). These reports, as seen in Appendix C, include:

- Technical Memorandum 1: Current Solid Waste Management System Overview;
- Technical Memorandum 2: Preliminary Options for Consideration for Plan Update; and
- Technical Memorandum 3: Financial and Technical Analysis.

2.0 BACKGROUND

2.1 Plan History

The CVRD SWMP Update applies to all aspects of municipal solid waste management in the CVRD. As per the *BC Environment Management Act*, municipal solid waste does not include liquid waste, agricultural waste, or biosolids.

The first SWMP was submitted to the Ministry in November 1995. Since then, the SWMP has undergone three major amendments which took place in 1997, 2002, and 2006. A five-year review of the 2006 SWMP was completed in 2011, and it found that no major changes in direction were required. In 2017, the CVRD completed a SWMP Status Report that provides an update on the current system and progress towards goals. The 2017 CVRD SWMP Status Report is located in Appendix B.

The initiatives in the 2006 SWMP are complete or have been incorporated into the CVRD's day-to-day operations as ongoing items.

Table 2-1 presents initiative highlights. The statuses of all 2006 SWMP initiatives are included in Appendix B.

Table 2-1: Highlights of 2006 SWMP Initiatives

Planned Initiative Group	Highlights
Regulation of Solid Waste Management System	<ul style="list-style-type: none"> Adopted and implemented CVRD Bylaw No. 2020 and Bylaw No. 3716 <ul style="list-style-type: none"> Prohibits open burning of landclearing debris and restricts backyard burning of yard waste Continued implementation of CVRD Bylaw No. 2570 <ul style="list-style-type: none"> Issuance and enforcement for licensing of solid waste facilities
Waste Reduction	<ul style="list-style-type: none"> Published the Environmental Guide and Recycling Directory online Published an environmental education manual for students
Reuse	<ul style="list-style-type: none"> Promotion of opportunities for reuse and repair Implemented 'Free Stores' at Bings Creek and Peerless Road
Recycle	<ul style="list-style-type: none"> Focused efforts to optimize participation in curbside recycling programs Phased out the Multi-Product Neighbourhood Recycling Bin Program Emphasized the existing material ban provisions of CVRD Bylaw No. 2108 to encourage local businesses to make use of recycling opportunities (ongoing) Developed a dedicated Food Waste Tipping and Transfer Area at Bings Creek Evaluated feasibility for the provision of on-site processing at Bings Creek Redeveloped the west side of the residential tipping area at Bings Creek Promoted licensed private waste management facilities to residents Provided enforcement measures against unlicensed facilities Promotion of non-burning management practices for land-clearing materials Introduced year-round free tipping of yard and garden waste at CVRD Recycling Centres Improved tipping and transfer of residential and commercial food waste at Bings Creek
Recovery	<ul style="list-style-type: none"> Evaluated feasibility for technologies to manage CRD, CVRD & RDN residual waste and evaluation of the technology's potential markets for producing fuel, power, steam or other products
Residual Waste Management	<ul style="list-style-type: none"> Evaluated feasibility for a residual waste tipping area for residential and small commercial self-haul customers adjacent to the main tipping floor at Bings Creek Purchased a roll off truck and containers for local materials transfer Launched an illegal dumping prevention campaign in partnership with the AVICC Updated Free Tipping policy to support illegal dumping clean-up

The draft 2018 SWMP is an update of the CVRD's 2006 SWMP and once approved by the Province (along with any approval conditions), becomes a regulatory document for solid waste management and guides solid waste management related activities in the CVRD for the next 10 years.

2.2 Plan Area

The SWMP applies to the entire CVRD region. The CVRD covers a land area of 3,473 square kilometres on the east coast of Vancouver Island and includes several Gulf Islands, including Thetis, Kuper, and Valdes. Regional districts are modeled after federations and are composed of municipalities and Electoral Areas, each of which have representation on the regional board. The CVRD is comprised of nine Electoral Areas (A-I) and four municipalities: The City of Duncan (Duncan), the Town of Ladysmith (Ladysmith), the Town of Lake Cowichan (Lake Cowichan), and the District Municipality of North Cowichan (North Cowichan). The regional district offices are in Duncan. There are 10 First Nations and 35 First Nations Reservations within the boundaries of the CVRD, however, First Nations have autonomy over their utility infrastructure, including solid waste. The CVRD acknowledges and supports opportunities for First Nations and CVRD communities to work together to improve solid waste management in the

region, including reducing illegal dumping on the First Nations lands. Figure 2-1 is a map of CVRD; Appendix D contains several maps of CVRD with details about the solid waste management system.



Figure 2-1: Map of Cowichan Valley Regional District

The CVRD has adopted bylaws that promote sound environmental management for regional waste systems and support the CVRD's waste reduction and diversion goals. Solid Waste bylaws adopted by the CVRD include:

- Bylaw No. 1958 – Cowichan Valley Regional District Garbage and/or Recyclable Materials Collection, 1999;
- Bylaw No. 3716 – Smoke Control Regulation Bylaw, 2013;
- Bylaw No. 2020 – Landclearing Management Regulation Bylaw, 2006;
- Bylaw No. 2570 – Waste Stream Management Licencing Bylaw, 2004; and
- Bylaw No. 2108 – Solid Waste Management Charges & Regulations Bylaw, 2000.

2.2.1 Demographic Information

The CVRD has a population of 83,739 residents that reside in four unique municipalities, nine Electoral Areas, and 10 First Nations communities. Of these residents, approximately 55% reside within municipalities, 40% reside in Electoral Areas, and 5% of residents live on First Nations Reserves. The CVRD's largest population centres are

North Cowichan (29,676) and Ladysmith (8,537). Demographic information for the CVRD is presented in Table 2-2.

Table 2-2: Regional Demographic Information

Area	Population (2016) ³	Population Rate of Growth, 2011 - 2016	Population Density per square kilometre	Land Area in square kilometres
CVRD	83,739	4.2%	24.1	3,474.52
Electoral Area A	4,733	7.7%	96.0	49.31
Electoral Area B	8,558	5.3%	27.9	306.47
Electoral Area C	5,019	4.6%	222.2	22.59
Electoral Area D	3,243	9.2%	207.4	15.64
Electoral Area E	4,121	6.9%	30.6	34.85
Electoral Area F	1,629	-1.2%	0.9	1,792.34
Electoral Area G	2,325	4.7%	7.9	294.65
Electoral Area H	2,446	4.9%	29.4	83.09
Electoral Area I	1,206	8.6%	2.4	505.80
City of Duncan	4,944	0.2%	2,387.1	2.07
District of North Cowichan	29,676	3.0%	151.7	195.56
Town of Lake Cowichan	3,226	8.5%	389.3	8.29
Town of Ladysmith	8,537	7.8%	711.9	11.99
First Nations Reserves ⁴	4,076	-	-	-

The average population density in the CVRD is 24.1 persons per square kilometre, however, this varies greatly between communities. Duncan has the highest population density at 2,387.1 persons per square kilometre³. Most CVRD residents live on the eastern side of the region along the TransCanada Highway. The regional population density is illustrated in Map 2 in Appendix D.

Between 2011 and 2016, the regional population growth rate was 4.2%, which is lower than the provincial population growth rate of 5.6%. Electoral Area D (Cowichan Bay) and Lake Cowichan saw the greatest population growth from 2011 to 2016, at 9.2% and 8.5%, respectively.

Approximately 10% of residences in the CVRD are multi-family (MF) residences, most of which are in North Cowichan and Duncan. The average household size in the region is 2.3 persons per household³.

The median after-tax income of households in the CVRD in 2015 was \$57,783. Median household incomes are highest in Electoral Areas A, B and C, averaging \$68,149 in 2015³. Median after-tax household incomes in 2015 were lowest in Electoral Area I and in Duncan.

³Statistics Canada. 2017. Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa a. Released October 25, 2017.

⁴Detailed data is not provided as the communities are excluded from the Plan Area.

2.2.1.1 First Nations

The CVRD encompasses traditional territories of 10 First Nations in 35 First Nations Reservations in the Coast Salish and Nuuchah-nulth tribal regions. Although not part of the plan area, First Nations communities rely on regional solid waste services and infrastructure including waste transfer stations and Recycling Centres. The CVRD maintains Municipal Type Service Agreements (MTSAs) with some local First Nations for their use of CVRD solid waste infrastructure, while other First Nations communities use the services on an informal basis. Two closed landfill sites are located on Cowichan Tribes Reserve lands.

2.2.2 Solid Waste Management Facilities

Municipal solid waste (MSW) in the region can be directed for management to any authorized site or facility identified in the plan. A map of all facilities in the CVRD is presented in Appendix D. There are three public transfer facilities in the CVRD and seven private transfer and/or processing facilities, as detailed in Table 2-3. The CVRD licenses private garbage and recycling facilities under Bylaw No. 2570. The CVRD is one of three RDs in the Province that licenses private facilities.

The Elizabeth Compton burn pit is a Ministry-permitted landclearing debris disposal facility operating in North Cowichan. There are no municipal solid waste landfills in the CVRD. Currently, waste destined for disposal is exported to an out-of-region landfill, the Roosevelt Regional Landfill in Washington State, USA. The CVRD maintains a contingency disposal agreement with the Regional District of Nanaimo (RDN), in the event that export to the Roosevelt Landfill is temporarily disrupted. A landclearing debris disposal facility is also located in North Cowichan. Since 1994, the Elizabeth Compton Burn Pit has held a permit with the Ministry to burn landclearing debris to a maximum quantity of 1,500 cubic meters per year. Under the permit, the burn pit is required to undertake every reasonable alternative to burning the landclearing material and to comply with the CVRD's SWMP. Under CVRD Bylaw No. 2570, burning of recyclable material is not permitted, however alternatives to burning are permitted. The Elizabeth Compton Burn Pit and any other burn pit within the CVRD are required to obtain all necessary licences and permits and abide by all regulatory requirements to continue their operation.

Table 2-3 presents the waste management facilities in the CVRD and indicates their type, location, and their ownership model. All waste management facilities in the CVRD are shown in Map 4 in Appendix D.

Table 2-3: Waste Management Facilities in CVRD

	Facility Name	Facility Type	Location(s)	Ownership Model
Transfer Stations and Drop-Off Depots	Bings Creek Recycling Centre & Garbage Drop-Off Depot	Drop-off Depot and Transfer Station	Duncan	Public
	Meade Creek Recycling Centre & Garbage Drop-Off Depot	Drop-off Depot	Lake Cowichan	Public
	Peerless Road Recycling Centre & Garbage Drop-Off Depot	Drop-off Depot	Ladysmith	Public
	Coast Environmental	Transfer Station, Drop-off Depot, Organics Processor, Contaminated Soil Drop-Off, Hazardous Waste Disposal (e.g., asbestos-containing materials)	Duncan and Chemainus	Private
	Fisher Road Recycling	Transfer Station, Drop-off Depot, Organics Processor	Cobble Hill	Private
Recycling Processors	Cowichan Energy Alternatives	Waste Vegetable Oil Processor	Duncan	Private (non-profit)
	Hillside Stone & Garden	Wood, Rubble and Yard Waste Drop-off	Duncan	Private
	Schnitzer Steel	Scrap Metals Drop-off and Processor	North Oyster	Private
	Stone Pacific Contracting Ltd.	Rubble and Glass Processor	Duncan	Private
Bottle Depots	Island Return It	Bottle Depot	Duncan and Cobble Hill	Private
	Junction Bottle Depot	Bottle Depot	Ladysmith	Private

2.2.2.1 Transfer Stations

All transfer stations in the CVRD are summarized in Table 2-3. There is one large public transfer station in the region: the CVRD-owned and -operated Bings Creek Recycling Centre & Garbage Drop-Off Depot. It is a centralized public transfer station for materials collected throughout the region hauled by municipalities, the CVRD, residents, institutions, commercial businesses, and materials collected from CVRD Recycling Centres.

Two private licensed transfer facilities exist in the CVRD. Fisher Road Recycling receives privately-hauled garbage, recyclables, and organics, including materials collected in subscription-based curbside collection programs from Electoral Areas A, B and C. Coast Environmental (with locations in Duncan and Chemainus) offers transfer facilities for commercial and residential garbage and C&D materials.

2.2.2.2 Processors

All processors of organics and recyclable materials in the CVRD are summarized in Table 2-3. For recyclable materials, processors are facilities that sort and sell (or use) recycled materials. Organics processors are facilities that recover nutrients from waste organic materials through composting or another process (for example, anaerobic digestion). There are no processors for comingled recyclables in the CVRD; these materials are transported to a materials recycling facility (MRF) in either Nanaimo or Victoria.

2.2.2.3 Closed Facilities

Until the late 1990s, the region relied on three MSW incinerators and one municipal landfill site for waste disposal. These sites are presented in Table 2-4. All sites described in Table 2-4 are currently being monitored, except for the Koksilah Road Incinerator site which is currently under mediation.

Table 2-4: Historic Disposal Sites Activities

Facility	Location	Years of Operation	Operator	Current Activity
Koksilah Road Sanitary Landfill	Near Duncan, on Cowichan Tribes Reserve Land	1959-1973 (Unpermitted) 1973 – 1998 (Permitted)	City of Duncan CVRD	<ul style="list-style-type: none"> Tri-annual ground- and surface-water monitoring at the landfill site Regular cover inspections and site maintenance
Koksilah Road Incinerator	Near Duncan, on Cowichan Tribes Reserve Land	1981-1995	CVRD	<ul style="list-style-type: none"> Cowichan Tribes and the CVRD are currently engaged in mediation to explore alternate remediation options for remaining incinerator ash
Peerless Road Incinerator	South of Ladysmith	1979-1998	CVRD	<ul style="list-style-type: none"> Buildings have been converted to use as a municipal waste and recycling drop-off depot Regular monitoring of closed incinerator ash landfill
Meade Creek Incinerator	West of Lake Cowichan	1976-1998	CVRD	<ul style="list-style-type: none"> Buildings have been converted to use as a municipal waste and recycling drop-off depot Regular monitoring of closed incinerator ash landfill

In addition to the above-listed sites, previous Solid Waste Management Plans have referenced up to eleven old, unpermitted landfill sites that were located throughout the region at one time. Since 1995, the SWMP has included a commitment to close these sites; however, further investigation⁵ has indicated that the CVRD is not responsible for remediation of the sites, with the exception of the Koksilah Landfill site listed above; remaining sites were not owned or operated by the CVRD at any time. The CVRD's Historical Landfill Report is included as Appendix F.

2.2.3 Solid Waste and Recycling Collection

Three types of waste collection exist in the CVRD:

- Public collection, or publicly contracted collection;
- Private collection; and
- Self-haul by residents or small businesses to drop-off depots.

2.2.3.1 Residential Curbside Collection

Residential waste means waste from single-family (SF) and multi-family (MF) residences. In this report, single-family residences refer to all single-family homes and multi-family buildings with four or less units. Multi-family residences refer to all multi-family buildings with five or more units.

Table 2-5 summarizes the curbside collection services for garbage, recycling, and organics in the region. Cells highlighted in red indicate that there is no collection available; cells highlighted in orange indicate that service is available from a private hauler, if required, but not mandatory for residents to participate. Map 3 in Appendix D illustrates the geographical boundaries of curbside collection services delivered by municipalities and the CVRD.

⁵ Historical Landfill Report, CVRD 2016

Table 2-5: Residential Curbside Collection

Municipality or Electoral Area		Single Family			Other Collection
		Garbage	Organics	Recycling	
Municipalities	Duncan	Yes	Yes	Yes	Monthly glass and yard waste collection for single family residences.
	North Cowichan	Yes	Yes	Yes	None
	Lake Cowichan	Yes	Yes	Yes	Garbage, recycling, and organics collection offered to all multi-family buildings and commercial businesses.
	Ladysmith	Yes	Yes	Yes	None
Electoral Areas	Electoral Areas A, B, C, some parts of Area D	Opt-In ¹	Opt-In ⁶	Yes	None
	Electoral Areas D, E, F, G, and I	Yes	No	Yes	None
	Electoral Area H	Opt-In ¹	No	Yes	None

Single-Family Garbage

All municipalities provide every-other-week curbside garbage collection to single-family homes within municipal boundaries. In the Electoral Areas, curbside garbage collection service levels vary. The CVRD provides curbside garbage collection to approximately 5,300 households in Electoral Areas D, E, F, G, and I. Areas A, B, C, and H have no mandatory garbage collection service, but residents in these areas can access a private hauler and subscribe to a garbage collection service. Subscription service is not available to all residents.

Single-Family Recycling

Participation in residential curbside recycling is mandatory across the region and curbside recycling collection is provided to all SF homes. Municipalities provide curbside recycling collection services to within municipal boundaries. The CVRD provides curbside recycling services to all SF homes in Electoral Areas (approximately 13,500 homes).

Single-Family Organics

Within municipalities, participation in curbside organics programs is mandatory and weekly collection services are offered. Participation in curbside organics collection programs is not mandatory in Electoral Areas and curbside organics service is not consistently available. Currently, there is no organics collection service available in Electoral Areas E, F, G, H or I. Residents in Electoral Areas A, B, C, and some parts of Area D, can access organics collection on a subscription basis from a private hauler. Subscription service is not available to all residents.

Multi-Family Collection

Except in Lake Cowichan, MF buildings with more than four units are serviced by the private sector. Service varies widely between buildings. Some are underserved with no mixed recycling collection, no access to the provincially mandated EPR program for Packaging and Printed Paper (PPP), and no organics collection.

⁶ Collection services can be arranged by the resident through the private sector on a subscription basis

2.2.3.2 Industrial, Commercial, and Institutional (ICI) Collection

Except in Lake Cowichan, the ICI sector is serviced by the private sector for garbage, recycling and organics collection. Services vary widely, from three-stream collection (garbage, recycling, and organics) to garbage only. Small-volume commercial generators may choose to self-haul garbage and recyclable materials to depots. Public and private depots can accommodate small quantities of commercial material for most recycling programs. Public depots also offer collection for small quantities of plastic and film plastic packaging from commercial generators.

Lake Cowichan's municipal curbside collection program for garbage, recycling and organics is offered to all businesses within the Town's boundaries. Service is not mandatory, and businesses have the option to obtain private service instead.

2.2.3.3 Depot Collection

Materials not collected by curbside programs are typically self-hauled by residents and businesses to recycling drop-off depots. Residents and businesses that may use these depots include:

- Residents who do not receive curbside garbage collection (may include residents in Electoral Areas A, B, C and H);
- Residents who occasionally produce more garbage than they can dispose of at curbside; and
- Residents who wish to recycle materials that are not accepted in their curbside recycling program.

The drop-off depots in the region include three CVRD-owned and -operated facilities (Bings Creek, Peerless Road, and Meade Creek) and seven private facilities. The southern Electoral Areas (A, B, and C) are served exclusively by private facilities. In lieu of a public depot, the CVRD partners with private sector depots to offer free drop-off for packaging and printed paper, and yard waste, for south end residents.

2.3 Disposal and Recycling Data

In 2017, an estimated 30,608 tonnes of waste were disposed from within the region, which amounts to a disposal rate of 358 kg per capita. The total amount of materials recycled (including organic materials) was approximately 44,000 tonnes, which gives an estimated recycling rate of 525 kg per capita. Table 2-6 presents the historical disposal and recycling rates for the region. These quantities represent amounts which are disposed at public and licensed private facilities within the regional district, and include material received from First Nation communities⁷.

The CVRD has one of the lowest disposal rates in the province and is well below the average provincial disposal rate of 498 kg per capita.

Of the material disposed from within the region, most materials disposed in the CVRD are taken to public facilities (22,000 tonnes).

⁷ Material delivered to the CVRD Bings Creek from First Nation's communities in 2017 included 987 tonnes of waste and 87 tonnes of recyclables (PPP, organics, and other items).

Table 2-6: Tonnes by Sector (2016)

Sector	Percent of Total Disposed Materials ⁸	Quantity of Disposed Materials (tonnes)
Single-Family (municipalities)	10%	3,010
Single-Family (Electoral Areas)	9%	2,709
Multi-Family	8%	2,408
Industrial, Commercial, and Institutional	41%	12,341
Drop-off	16%	4,816
Construction and Demolition	16%	4,816
Total Disposal Rate	100%	30,100

It is difficult to quantify the amount of waste that bypasses the CVRD system; that is, MF, ICI, or C&D waste that is shipped directly to out-of-region transfer stations or landfills. Loss of waste to private transfer stations that ship to out-of-region landfills is influenced by operational efficiencies and economic factors including the CVRD waste tipping fee and the US exchange rate. In 2013, 2015, and 2017, there were reductions in waste disposed at facilities in CVRD. These correspond with a decline in visits by some major commercial haulers.

The Cowichan Valley population is expected to grow to over 100,000 by 2040. If the current disposal rate was to stay constant at 358 kg per capita, the total disposal would increase to over 36,000 tonnes, as shown in Table 2-7. If the targets described in Section 1.2 are met, the 2040 disposal would decrease to approximately 15,000 tonnes.

Table 2-7: Disposal Projections⁹

Year	Population	Annual Disposal Rate (kg/capita)	Total Status Quo Annual Disposal (tonnes)	Adjusted Disposal Rate (kg/capita)	Adjusted Annual Disposal (tonnes)
2016	83,739	358	29,979	358	29,979
2020	87,217	358	31,224	320	27,909
2025	91,368	358	32,710	280	25,583
2030	95,199	358	34,081	250	23,800
2035	98,475	358	35,254	200	19,695
2040	101,074	358	36,184	150	15,161

2.4 Waste Composition

In 2015 and 2017, the CVRD conducted waste composition studies.

Results and disposal data were used to perform an analysis of materials which could be diverted from landfill based on the strategies proposed within this SWMP Update, presented on Figure 2-2. This diversion potential analysis is shown in full in Section 3.5 and will be noted as relevant throughout this report.

Overall, the amount of materials that could potentially be diverted in the overall waste stream is 41%. The largest divertible component of the waste disposed was wasted food (18.8%) and inedible organics materials (13.7%). Thus, overall, 32.5% of the waste stream is compostable organic materials. Recycling materials, consisting of

⁸ Adapted from the 2017 CVRD Waste Composition Study, Tetra Tech 2017

⁹ Population Projections (Updated November 2016), Island Coastal Economic Trust

containers and paper, makes up 9.1%. This material includes any material that could be recycled curbside in residential programs.

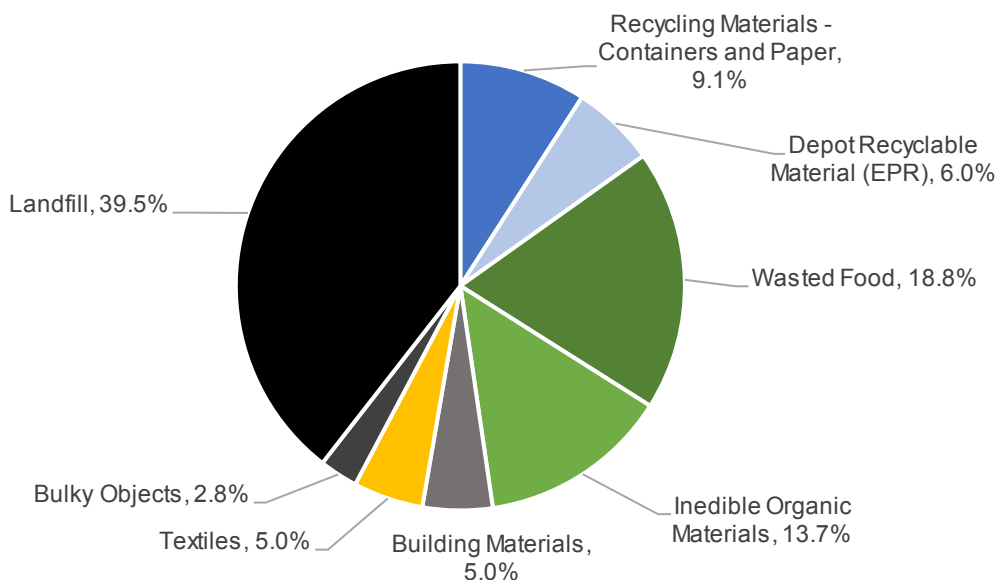


Figure 2-2: Diversion Potential CVRD Waste Stream

Figure 2-2 presents the 2017 overall waste composition for the CVRD by material category. Waste composition results by material category are useful for having a broad understanding of the waste profile, and they are extremely useful for comparison of results to past waste composition studies and data from other jurisdictions. However, the data does not directly map to diversion potential. For example, the 'Paper' on Figure 2-2 includes material that would be recycled (e.g., office paper), composted (e.g., paper towels), and landfilled (e.g., paper packaging adhered to plastic or metal). This accounts for the apparent discrepancy between Figure 2-2 and Figure 2-3.

For the overall waste stream, the largest component of the waste disposed was compostable organics (24.4%), followed by plastics (17.2%), and paper (11.1%).

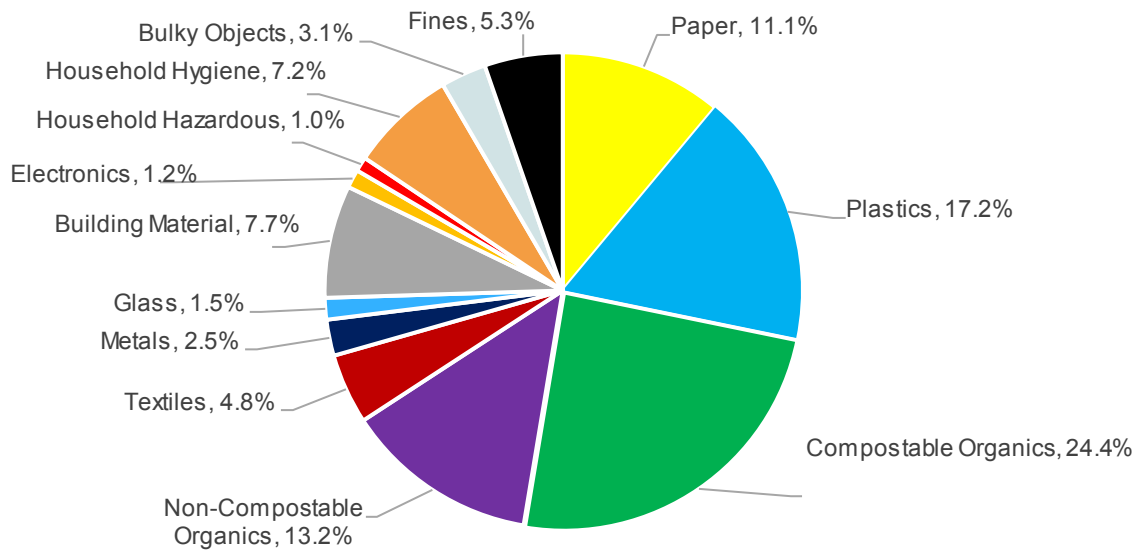


Figure 2-3: Waste Composition by Material Category¹⁰

The 2017 waste composition study showed that households with curbside organics collection have less organics in the garbage than households with organics collection. Households with mandatory organics collection have less organics in the garbage than households that are in regions with optional organics collection, as presented in Table 2-8. The differences in composition is primarily due to increased food waste (and not due to yard waste from larger rural properties).

Table 2-8: Correlation of Organics in Garbage to Varying Service Levels

Service Level Description	Areas	Proportion of Organics in Garbage
Mandatory organics collection	All municipalities	23%
Optional organics collection	Electoral Areas A-C	30%
No organics collection	Electoral Areas D-I	36%

¹⁰ 2017 CVRD Waste Composition Study

2.5 Waste Management System Participants

Table 2-9 provides a list of the various organizations that contribute to MSW management in the CVRD.

Table 2-9: Municipal Solid Waste Management Participants

Who	Roles in Solid Waste Management
Federal Government	<ul style="list-style-type: none"> Regulates waste management facilities under federal jurisdiction
Provincial Government	<ul style="list-style-type: none"> Approves Solid Waste Management Plans as regulated through the Environment Management Act Regulates Product Stewardship programs through the Recycling Regulation Authorizes discharges to the environment through permits and operational certificates Responsible for enforcement of Provincial regulations and the conditions set out in discharge permits and operational certificates Various Ministries have several other regulatory authorities related to waste management
Cowichan Valley Regional District	<ul style="list-style-type: none"> Develops plans to provide big picture oversight of waste management in the region Owns and operates waste management facilities Provides curbside garbage and recycling collection to Electoral Areas Through regional plans and plan implementation (including bylaws), works to meet regional waste disposal goals and targets and ensures that the communities have access to CVRD facilities and services Collaborates and cooperates with local organizations, businesses and agencies to implement plans and new programs Creates and enforces regional waste management bylaws Ensures that legislative and policy requirements are followed, including monitoring and reporting Supports the provision of Product Stewardship programs in the CVRD Provides waste management related education and promotion of programs
Product Stewardship Producers and Agencies	<ul style="list-style-type: none"> Ensure reasonable and free consumer access to collection facilities Collect and process stewarded products Coordinate local government delivery as a service provider where applicable Provide and/or fund education and marketing Provide deposit refunds to consumers (where applicable) Monitor and report on key performance indicators such as recovery rates to the Province on a regional district basis (when possible)
First Nations Communities	<ul style="list-style-type: none"> Provide waste management services to residents and businesses
Private Sector Haulers	<ul style="list-style-type: none"> Provide garbage, recycling, and organics collection services to ICI and MF Provide residential garbage and organics curbside collection services in select areas where it is not provided by the jurisdiction (Electoral Areas A, B, and C, and H)
Private Sector Facilities	<ul style="list-style-type: none"> Provide drop-off services for residents in areas further from public drop-off facilities
Non-Profit Sector	<ul style="list-style-type: none"> Applies for waste reduction funding through the available grant programs Engages in and promotes reuse and upcycling
Residents and Businesses	<ul style="list-style-type: none"> Responsible for carrying out proper waste reduction, recycling and disposal activities Collaborates and cooperates with local government initiatives
Neighbouring Jurisdictions	<ul style="list-style-type: none"> Identify and engage in opportunities for collaboration and cooperation

2.6 Areas for Improvement

The key issues for developing this plan emerged through a system analysis and ongoing discussions with the technical team and PAC and are summarized below. The strategies outlined in Section 3.0 address these areas for improvement. The Areas for Improvement herein are numbered in accordance with the strategies outline in Section 3.0.

1. There are currently insufficient programming and behaviour change resources to support the first levels of the pollution prevention hierarchy including rethink, reduce and reuse initiatives. Areas for improvement include:
 - Wasted Food – Overall, 5,500 tonnes of edible food are being wasted by the residential and ICI sectors;
 - Reuse Platforms – Historically, there have been limited opportunities to promote reuse within the region. The recent opening of a Habitat for Humanity ReStore within the City of Duncan has significantly improved local capacity for promoting reuse of building materials, but there are still opportunities to further develop reuse capacity, for example, through repair cafes and tool libraries;
 - Single-Use Item Reduction – Other nearby jurisdictions (Vancouver and Victoria) have recently implemented restrictions to reduce the use of plastic bags and other single-use items. Plastic bags are common contaminants in curbside recycling programs and can be problematic for recycling processors; and
 - Expansion of EPR Programs – Mattresses, bulky furniture, and textiles are not covered by EPR items in British Columbia.
2. The ICI and multi-family residential sectors are largely serviced by the private sector for garbage and recycling (except in Lake Cowichan). Waste composition data demonstrates that these sectors have relatively low diversion rates. Areas for improvement include:
 - Source Separation Requirements - The CVRD does not have any existing policy that requires waste haulers to service ICI and MF customers with recycling and organics collection; and
 - Materials Disposal Ban - The CVRD has an organics disposal ban for limited types of ICI organic materials, but enforcement could be improved and banned material types could be expanded. Adoption of a full organics disposal ban across sectors has been shown to have a considerable impact on increasing organics capture.
3. In some areas in the CVRD, residents have limited access to recycling and other collection services that optimize residential waste reduction efforts. Areas for improvement include:
 - Access to Depot Recycling – The majority of CVRD residents live within a 15-minute drive of public drop-off depots in the north, central and west parts of the region. However, more than 18,000 residents in Electoral Areas A, B, and C must drive further to access a public depot, or, may have to pay a fee to recycle items locally which are free to recycle at public depots. Garbage tipping fees can also be higher at private facilities. Hours of operation vary widely between depots and public depot hours are limited during the winter;
 - Curbside Garbage and Organics Collection – Over 33,000 residents in the CVRD do not have mandatory organics collection and over 20,000 residents do not have mandatory garbage collection. Residents in areas with no available organics collection, either public or private, have 13% more organics in the garbage than in areas with organics collection. While there is value in continuing to

- encourage residents to backyard compost, curbside organics collection captures items not typically composted in backyard composters; and
- Electoral Area residents without curbside garbage collection are provided with curbside recycling collection by the CVRD via an agreement with Recycle BC. Since the widespread adoption of RecycleBC's services across the province, audits reflect that programs with curbside garbage collection have significantly lower contamination rates in recycling. CVRD contamination rates are significantly above the norm and are higher in areas without mandatory garbage collection. Contamination rates will result in significant financial penalties to the CVRD and may inhibit the CVRD's ability to secure future service with Recycle BC. From a diversion perspective, jurisdictions across western Canada have consistently shown a 35-40% drop in garbage tonnage when implementing mandatory three-stream curbside collection (recycling, garbage, and organics including food scraps).
4. There are several organic processing facilities in the CVRD and many are generating odours that are significantly impacting residents and businesses. As the amount of organics being processed continues to grow, the potential for a growth in odour issues has increased. Furthermore, there is an opportunity to work with facilities and the Ministry to strengthen odour standards.
 5. There is no transfer or processing capacity for comingled ICI recyclable materials in the CVRD. This material is typically hauled out-of-region in packer trucks (vs. long haul transfer). Some larger commercial generators (e.g. big box stores) may recycle this material through in-house recycling programs.
 6. Despite related disposal bans, there is still a significant portion of C&D materials in the garbage. There is also limited disposal capacity for hazardous C&D materials (e.g. asbestos containing materials such as pre-1990 gypsum wallboard), and the material is costly to manage and properly dispose.
 7. As there is no local disposal capacity in the CVRD, municipal solid waste is exported to private landfills out-of-region. Garbage collected at the Bings Creek Transfer Station is taken to the Roosevelt Regional Landfill in Washington State, USA. The CVRD has one of the highest tipping fees and disposal costs in British Columbia, which impacts residents, businesses, and private collectors and processors. There may be options for local disposal, as outlined in Strategy 7. These options should be explored for feasibility.
 8. Illegal dumping of materials occurs throughout the CVRD, including in First Nations communities.
 9. The CVRD currently has limited disposal options for household hazardous waste, bulky items and organic debris. Areas for improvement include:
 - No collection options exist for residents to safely dispose of household hazardous liquids, which are not managed by an EPR program. These materials are occasionally disposed of in the garbage or illegally dumped, posing health and safety and environmental threats;
 - Bulky items, such as furniture and mattresses, are also difficult to dispose of and may contribute to illegal dumping. There are subsidized drop-off programs for mattresses and upholstered sofas and chairs at public depots, but those programs are less accessible for residents who cannot access transportation; and
 - Burning of organic materials continues to be an issue in the CVRD, causing air quality concerns.
 10. The CVRD has a number of closed disposal sites that continue to require ongoing monitoring and attention.
 11. The CVRD is developing an asset management program. Asset inventories and condition assessments have recently been completed for the Bings Creek and Peerless Road facilities. These components will form the foundation of an Asset Management Plan for the Waste Management Division. The Asset Management Plan, and accompanying financial strategies and operational policies, will outline the activities and resources required to ensure long-term sustainable service delivery.

12. The CVRD currently does not have a disaster management plan for solid waste in the event of a natural disaster.
13. Many of the strategies outlined herein require CVRD residents to change their behaviour in order to be successful. Consideration should be given to incorporation of best practices in behaviour change, education and outreach initiatives.

3.0 GOALS AND STRATEGIES

To reduce the disposal rate from the current 358 kg per capita to the disposal rate target of 250 kg per capita, the following programs and policies are recommended for implementation over the next 10 years. The recommendations are split into four categories:

1. Primary Waste Reduction/Diversion;
2. Recovery and Residuals Management;
3. Processing Infrastructure; and
4. Supporting System Resilience.

The strategies are intended to:

- Meet provincial regulations and goals;
- Align with requirement of RecycleBC and other contractual agreements;
- Meet Health and Safety requirements;
- Protect the environment and promote sustainability; and
- Move towards the goal of Zero Waste.

For each strategy, a table is included that describes the costs and timeline associated with the proposed program. The CVRD would ultimately be responsible for these costs. The CVRD's financial system and the strategy for recovering increased costs will be further discussed in Section 5.0.

The strategies listed below are high-level recommendations; many have subcomponents (A, B, C, etc.) and each has action items (i, ii, etc.).

3.1 Improve Waste Reduction and Diversion

Strategy 1: Enhance Reduce and Reuse Potential

A. Reduce Wasted Food from Residential and Industrial, Commercial, and Institutional Sectors

- i. **Promote residential food waste reduction through adoption of food waste prevention campaign.** Pursue development of a food waste prevention strategy; one option is participating in a current nationwide food waste prevention campaign such as "Love Food Hate Waste", a program designed to raise awareness to reduce the amount of wasted food by partnering with business and government to design and implement campaigns and tools to actively promote behaviour change.

- ii. **Support development of food rescue capacity within region.** Continue to support and augment food rescue capacity by convening and coordinating stakeholders, advocating to provincial and federal governments for a tax incentive to encourage businesses to donate surplus food, and collaborating with local stakeholders interested in food rescue.

B. Enhance and Improve Local Reuse Opportunities

- i. **Continue to explore further reduce and reuse opportunities.** Explore mechanisms through which the CVRD can support platforms for reuse, such as repair cafes, tool libraries, or building supply reclamation.

C. Support Bans on Single-Use Plastic Bags or Other Single-Use Items

- i. **Adopt single-use plastic reduction policy and share with member municipal governments and UBCM.** Explore programs and mechanisms used in other jurisdictions (e.g., City of Victoria, City of Vancouver) for supporting municipal bans on specific items within the CVRD.

D. Advocate for Expansion of EPR Programs

- i. **Continue advocacy work to Provincial government for expansion of EPR programs.** Stay abreast of industry trends through conferences and annual updates as provided by the Canadian Council of Ministers of the Environment (CCME) and the BC Product Stewardship Council (BCPSC) and advocate for new programs through direct correspondence with the Ministry or through associations of which CVRD is a member.

Table 3-1: Enhance Reduce and Reuse Potential - Costs and Timeline

Component	Operating Cost	Timeline
A-D	\$101,000	2019-2028

Strategy 2: Reduce Disposal from ICI and Multi-Family Residential

A. Mandate Source Separation for ICI and Multi-Family

- i. **Support development of bylaws and policies mandating source separation for ICI sector and multi-family residential.** Develop resources to support proposed mandates, such as education materials and proper signage. Engage with stakeholders to identify potential gaps and recommend improvements. Monitor progress on a regular basis.

B. Adopt a Full Organics Disposal Ban and Enhance Enforcement of Existing Material Disposal Bans

- i. **Adopt an organics disposal ban at the CVRD transfer station and enhance enforcement of existing material bans.** Promote disposal bans along with behaviour change programs and enhance enforcement to improve adherence to bylaws.

Table 3-2: Reduce Disposal from ICI and Multi-Family Residential - Costs and Timeline

Component	Operating Cost	Timeline
A: Mandate Source Separation	\$10,000	2020
B: Organics Disposal Ban	\$87,500	2019-2022

Strategy 3: Reduce Disposal from Residential Sector

A. Assess Opportunities for Access to Recycling Programs at Depots.

- i. **Evaluate opportunities to increase accessibility for public depots.** Conduct an analysis to determine optimal hours of operation for existing public depots to ensure that public depot services are broadly accessible.
- ii. **Continue to assess depot service levels for the south end.** Monitor the need for expanding or extending an agreement with private facilities to service the south end of the regional district to optimize equitable access to recycling programs.

B. Adopt Universal Curbside Collection Services Across the Region.

- i. **Adopt universal curbside collection services across the region.** Provide coverage to over 20,000 residents that do not yet have mandatory curbside garbage collection and over 33,000 residents that do not yet have mandatory curbside organics collection. Conduct a collection review to determine the most efficient and cost-effective collection methods, collection service type (private vs public hauling, an assessment of what materials are to be collected (e.g. yard trimmings plus food scraps vs. food scraps only, monthly glass collection), and other factors as identified by stakeholders and residents. As more BC jurisdictions adopt curbside collection of source separated materials, the capture rate for diverted items increased and garbage decreases by up to 40% by weight source separation.

Table 3-3: Reduce Disposal from Residential Sector - Costs and Timeline

Component	Operating Cost	Timeline
A: Assess depot accessibility	Embedded	2019-2023
B: Adopt Universal Curbside	\$30,000	2019-2020 (study)
B: Adopt Universal Curbside	\$22,842,404 ¹¹	2019-2028

3.2 Support Transport and Processing Infrastructure

Strategy 4: Improve Organics Processing

A. Ensure Best Management Practices for Odour Management

- i. **Ensure use of best management practices for odour management.** Conduct third party verification of capital and operational works to assess and explore opportunities to incorporate advanced processes or technologies for organics processing that may reduce odour impacts to the environment and receptors. Continue to develop Bylaw No. 2570 to accommodate current and emerging technologies and ensure bylaw enforcement.

B. Ensure Capacity for Local Organics Processing

- i. **Continue to assess demand and capacity for organics processing, assess and accommodate emerging technologies and ensure effective end markets for final products before residuals disposal.** As an increase to organics diversion within the region may put

¹¹ ¹ Annual cost estimated at \$2.7 million, contracted or in-house TBD

pressure on local processing capacity, consider mechanisms to secure local processing capacity to allow for the sustainable long-term operation of local diversion programs. Future options may also consider non-MSW related items, including but not limited to biosolids.

Table 3-4: Improve Organics Processing - Costs and Timeline

Component	Operating Cost	Timeline
A: Odour Management	\$15,000	2019-2028
B: Ensure Organics Processing Capacity	Embedded	2021-2028

Strategy 5: Investigate Processing and Transfer Capacity for ICI Recyclables

A. Perform a Feasibility Assessment for Development of ICI Transfer Capacity

- i. **Assess gaps and recommend further opportunities for ICI transfer capacity and processing within the CVRD.** Investigate options for the most feasible or cost-effective approach for managing ICI recyclables. This may include a feasibility study to assess the logistics and costs to accept comingled ICI recyclable materials at the Bings Creek Transfer Station or at a private sector facility.

Table 3-5: Investigate Processing and Transfer Capacity for Recyclables - Costs and Timeline

Component	Operating Cost	Timeline
A: Transfer Capacity Feasibility Assessment	\$15,000	2020

Strategy 6: Improve Management of Construction and Demolition (C&D) Materials

A. Monitor C&D Disposal and Recycling Activities in the Region

- i. **Conduct C&D waste system analysis to identify issues, opportunities and gaps.** Analyze how residents and businesses are managing C&D waste, where it is taken to and available capacity for managing this waste stream. This study can also assess the current recycling/waste diversion activities in the region and whether there is a need to develop mechanisms to further divert C&D materials from disposal.

B. Develop a C&D Waste Management Strategy

- i. **Develop a C&D waste management strategy for the region.** Consider the results from the C&D waste system analysis, consult with key stakeholders (i.e. construction industry, C&D waste processor, waste haulers, municipalities, etc.) and develop a strategy that follows the goals and principles of the SWMP. The strategy would set capture targets and specify that materials are to be taken to permitted facilities. This action may include deconstruction policies, a disposal ban for C&D materials, and/or collaborating with neighbouring regional districts.

C. Reduce Barriers to Disposing Hazardous Materials (asbestos, gypsum wallboard)

- i. **Assess options and prepare business case for different residential hazardous waste disposal options, e.g. cost subsidy for pre-1990 residential gypsum wallboard.** Consider reducing barriers to legally disposing of these materials by providing a disposal subsidy.

Table 3-6: Improve Management of Construction and Demolition Materials - Costs and Timeline

Component	Operating Cost	Timeline
A: Monitor C&D and B: Develop C&D Strategy	\$30,000	2022-2023
C: Hazardous Material Disposal	\$800,000	2021-2028

3.3 Improve Recovery and Residuals Management

Strategy 7: Explore Options for Local Disposal

A. Explore Options for Local Disposal

- i. **Review feasibility of alternative disposal options.** The CVRD has previously completed feasibility studies for available waste to energy (WTE) facilities as well as siting a local landfill. For short term planning over the next five to 10 years, investing and acquiring a publicly-owned local landfill or a WTE facility (e.g., gasification, thermal or others) is not considered feasible, especially if the regional disposal of MSW is currently around 31,000 metric tonnes per year. The CVRD will consider other available disposal options and complete a feasibility study to choose the best option suited for the CVRD and will consider overall sustainability as it relates to economic, environmental and social considerations.

In September 2018, the CVRD completed a Request for Information (RFI) process, to review available short-term solutions for the MSW disposal as part of residuals management. Table 3-7 lists the options the CVRD has received and that can be accessed immediately or within five years.

Table 3-7: Options for Disposal (Short-Term)

Option	Description
Continue Waste Export	Currently, waste is placed in shipping containers, barged to the mainland, transported by rail to Southeastern Washington State, and taken to the Roosevelt Regional Landfill for disposal. The empty shipping containers are brought back to the CVRD to be filled with waste again. This disposal program costs approximately \$140 per tonne. Rabanco landfill is available for MSW disposal.
Landfill in BC	Cache Creek Landfill in Ashcroft will be available for MSW disposal in mid-2019. The feasibility of disposal at this landfill facility should be explored.
Waste to Energy (Private Facility)	It is possible that a new private (or public private partnership) WTE facility may be built on the island. Depending on the permits, the facility may be available within two to three years. The feasibility of disposal at this potential WTE facility should be explored.

- ii. **Review feasibility of additional alternative disposal options.** The SWMP Update recognizes that some regional districts on the island have already completed their SWMPs or are currently updating them. To meet their goals and targets, other opportunities for residual management may arise. The SWMP Update will also consider any future change in available technologies, economic viability or other opportunities for residual management best suited for the CVRD. The CVRD will consider publicly-owned or public/private partnerships (P3) for residual waste processing and disposal options as they become available, which should prompt a SWMP Update accordingly.

The CVRD is currently a partner with the AVICC and will continue to seek collaborative residual waste management approaches across CVRD boundaries. The CVRD will continue to review available alternative local disposal options

based on the guiding principles identified in this SWMP Update as well as sustainability. If required, the CVRD will complete a feasibility study on alternative disposal options (e.g. WTE). Additional alternative options are presented in Table 3-8; this list is not exhaustive.

Table 3-8: Options for Disposal (Long-Term)

Option	Description
Landfill Disposal on the Island	A new landfill was recently opened in Comox Valley. Preliminary conversations have indicated that the Comox Valley Regional District may be open to receiving waste from the Cowichan Valley Regional District. MSW disposal opportunities will continue to be explored as they arise in regional districts with landfills, including (but not limited to) the Alberni Clayoquot Regional District, Mount Waddington Regional District, the Regional District of Nanaimo and the Capital Regional District. The feasibility of disposal at available Vancouver Island landfills should be explored.
Waste to Energy (Public Facility)	Two recent studies reviewed the feasibility of a Waste to Energy (WTE) facility for southern Vancouver Island. Both studies determined that viable technology exists but is not economically feasible. However, if a new technology becomes available, a feasibility assessment should be carried out to further assess the viability of a business case for a public or P3 partnership WTE facility.
Waste to Energy (Private or owned by others Facility)	It is possible that a new private (or owned by others) WTE facility may be built within the Cowichan Valley. The feasibility of disposal at this potential WTE facility should be explored.

B. Explore and Amend Tipping Fee

- i. **Review tipping fee in concert with consideration of future disposal options and update if needed.** The CVRD MSW tipping fee has remained unchanged since 2012. The current tipping fee is \$140 per tonne, which does not cover the full cost of processing and disposal. As future disposal options are considered, the tipping fee should be reviewed and updated as needed.

Table 3-9: Explore Options for Local Disposal

Component	Operating Cost	Timeline
A: Local Disposal Options	\$20,000	2019
B: Explore and Amend Tipping Fee	Embedded	2019-2028

Strategy 8: Reduce Illegal Dumping

A. Augment Illegal Dumping Prevention Strategies

- i. **Continue to assess and track illegal dumping activities, support volunteers and non-profit organizations for clean-up activities.** Consider increasing the current cap on tipping fee exemptions for eligible community organizations undertaking clean-up.
- ii. **Implement multi-year illegal dumping education program using community-based social marketing (CBSM) and develop reporting program.**

Table 3-10: Reduce Illegal Dumping - Costs and Timeline

Component	Operating Cost	Timeline
A: Reduce Illegal Dumping	Embedded	2019-2028

Strategy 9: Implement Collection/Drop-off for HHW, Bulky Items and Organic Debris

A. Introduce Collection for HHW

- i. **Develop collection program(s) for residential unlabelled liquid HHW.** Collect household hazardous materials (which are not managed by an EPR program) at CVRD Recycling Facilities. This could be implemented on a periodic (annual or seasonal) or year-round basis. Consider creating agreements (or expand existing agreements) with private facilities to subsidize them to accept these materials.

B. Improve Recycling Opportunities for Bulky Items

- i. **Assess options to support recycling of bulky items and prepare business case, e.g. subsidized annual collection of mattresses at Bings Creek.** Determine viable and sustainable options for improving bulky item drop off opportunities.

C. Assess Effective Ways to Reduce Open Burning of Wood Waste

- i. **Identify and assess feasibility of options for reducing open burning of wood waste.** Review the feasibility of offering yard waste collection at curbside, either regularly as part of a food waste collection program, or seasonally as a stand-alone program, and/or implementation of a seasonal wood chipping service, which could be operated at a fixed location within communities or at the curbside and run by public sector staff or private contracted operators.

Table 3-11: Introduce/Improve Collection/Drop-off for HHW, Bulky Items and Organic Debris - Costs and Timeline

Component	Operating Cost	Timeline
A: HHW Collection	\$900,000	2020-2028
B: Bulky Item Recycling	\$675,000	2020-2028
C: Reduce Wood Waste Burning	Embedded	2022

Strategy 10: Monitor Historic Disposal Sites

A. Monitor Historic Disposal Sites

- i. **Continue to monitor closed landfill (including ash landfill) sites as required by the Ministry of Environment and Climate Change Strategy; remediate outstanding contamination for CVRD-owned or leased sites as necessary.** Reserve annual resources to monitor and address potential concerns. Monitoring should continue unless it can be demonstrated that these sites are no longer an environmental concern.

Table 3-12: Monitor Historic Disposal Sites - Costs and Timeline

Component	Operating Cost	Timeline
A: Monitoring of Historic Disposal Sites	Embedded	2019-2028

3.4 Support System Resilience

Strategy 11: Implement Asset Management Plan

A. Implement Asset Management Plan

- i. **Implement Asset Management Plans at CVRD solid waste facilities.** Continue to define Levels of Service for the Asset Management Plan and refine and implement financial and operational policies to ensure long-term sustainable resource delivery.

B. Develop Bings Creek Transfer Station 10-Year Plan

- i. **Develop a ten-year site management plan for the Bings Creek Solid Waste Management Facility.** Consider the type and amount of material the facility will receive, any processing that could occur on site and a condition assessment of the structures as part of an organization-wide asset management program.

Table 3-13: Create an Asset Management Plan - Costs and Timeline

Component	Operating Cost	Timeline
A: Asset Management Plan	\$690,000	2019-2028
B: Bings Creek 10-Yr Plan	\$10,000	2019

Strategy 12: Develop a Disaster Management Plan

A. Develop a Disaster Management Plan

- i. **Develop a disaster management plan for solid waste services and infrastructure, as part of the corporate Disaster Management Plan.**

Table 3-14: Develop a Disaster Management Plan - Costs and Timeline

Component	Operating Cost	Timeline
A: Disaster Management Plan	\$15,000	2019-2020

Strategy 13: Integrate Education and Behaviour Change Best Practices

Increased education is not presented as a separate strategy in this document. Many of the strategies outlined herein would require CVRD residents to change their behaviour related to waste reduction, diversion, and using best practices to reduce potential wildlife conflicts related to solid waste management. To be successful, these strategies would require education programs to incorporate best practices. Therefore, Strategy 13 includes the following components and actions:

A. Consider Best Management Practices for Education and Behaviour Change Programs

- i. **Continue to assess and incorporate principles of community-based social marketing (CBSM) into existing and new education and outreach programs as necessary.**

B. Continue to support and encourage recycling education through ongoing promotion of the Zero Waste Events program

In addition to continuing to promote waste reduction and diversion programs through vivid print and electronic communications tools, social media (e.g., Facebook, Twitter, YouTube), and hands on technical assistance, other behaviour change tools can be integrated into education efforts. The behaviour changes tactics outlined within community-based social marketing (CBSM) can provide a framework for how to most effectively target a specific behaviour. Derived from social marketing by Doug McKenzie-Mohr, an environmental psychologist, CBSM offers several behaviour change tools that can be incorporated into existing and future education initiatives. Examples of CBSM behaviour-based tools include:

1. **Commitment** – By agreeing to a small request, people have subsequently been found to be far more likely to agree to a larger request.
2. **Prompts** – Prompts can also be used to encourage people to engage in positive behaviour. By providing visual or auditory aids, people are reminded to perform a particular action. Prompts often take the form of a sticker or tag posted in close proximity to the action.
3. **Norms** – Norms guide how we behave and are largely influenced by the behaviour of those around us. If members of our community, especially our immediate networks, are living sustainably, we are more likely to do the same.
4. **Social Diffusion** – New behaviours are frequently adopted because friends, colleagues, or competitors have changed certain behaviours. To encourage social diffusion, make commitments to new behaviours public and visible (such as adding a sticker for another environmental behaviour to the side of a collection container) and/or recruit well known and respected opinion leaders in the community to promote a specific behaviour.
5. **Communication** – The more relevant messages are to a group, the more likely it is to captivate someone's attention.
6. **Incentives/Disincentives** – Closely pairing an incentive, or reward, to specific positive behaviour can have a substantial impact on encouraging sustainable activities. This strategy is particularly useful when motivation to engage in action is low or people are not doing the activity as effectively as they could.
7. **Convenience** – Consider the external barriers related to a project, how they can be overcome, and what resources are needed to successfully address them.

Community festivals and events represent public engagement opportunities. The CVRD will continue to promote the Zero Waste Events program, which provides recycling station equipment (signage and totes) to community events such as markets, festivals and private gatherings for a nominal cost, in order to promote waste reduction and diversion. The program also provides training guidelines to assist event organizers in achieving effective waste diversion.

Table 3-15: Education and Behaviour Change Considerations - Costs and Timeline

Component	Operating Cost	Timeline
A: Education and Behaviour Change	Embedded	2019-2028
B: Zero Waste Events Program	Embedded	2019-2028

3.5 Resulting Diversion Potential

The recommended actions have the potential to significantly reduce the amount of solid waste disposed in the CVRD. As discussed in Section 1.2, the CVRD has an interim five-year disposal target of 280 kg per capita, a 10-year disposal target of 250 kg per capita, and a long-term target to be a zero waste community (approximately 150 kg per capita).

Table 3-16 outlines how the successful implementation of the strategies described in Section 3.0 would lead to these reduced disposal targets.

Table 3-16: Diversion Potential with Programs Implemented

			Interim Target - 5 Year		Plan Target – 10 Year	
Sector	Sector Contribution to Landfill (%)	Material Type	Expected Diversion Potential (%)	Diversion Potential out of Landfill (kg per capita)	Expected Diversion Potential (%)	Diversion Potential out of Landfill (kg per capita)
Single-Family (Municipalities)	10%	Curbside Recyclable Material	30%	1.1	60%	2.2
		Depot Recyclable Material (EPR)	30%	0.8	60%	1.7
		Wasted Food	30%	1.3	40%	1.8
		Inedible Organic Materials	30%	1.9	50%	3.2
		Building Materials	20%	0.2	50%	0.5
		Textiles	30%	0.8	30%	0.8
		Bulky Objects	10%	0.0	10%	0.0
Total SF (Muni) Diversion Potential (kg/capita)			6.3		10.2	
Single-Family (Electoral Areas)	9%	Curbside Recyclable Material	30%	0.8	60%	1.5
		Depot Recyclable Material (EPR)	50%	1.1	80%	1.7
		Wasted Food	60%	3.8	65%	4.1
		Inedible Organic Materials	50%	3.8	55%	4.2
		Building Materials	30%	0.4	30%	0.4
		Textiles	10%	0.2	10%	0.2
		Bulky Objects	20%	0.0	20%	0.0
Total SF (Electoral) Sector Diversion Potential			10.0		12.1	
Multi-Family	8%	Curbside Recyclable Material	30%	1.3	60%	2.6
		Depot Recyclable Material (EPR)	10%	0.3	60%	1.7
		Wasted Food	30%	1.5	50%	2.5
		Inedible Organic Materials	30%	1.9	30%	1.9
		Building Materials	10%	0.0	10%	0.0
		Textiles	20%	0.3	20%	0.3
		Bulky Objects	30%	0.0	30%	0.0
Total MF Diversion Potential			5.3		9.0	

			Interim Target - 5 Year		Plan Target – 10 Year	
Sector	Sector Contribution to Landfill (%)	Material Type	Expected Diversion Potential (%)	Diversion Potential out of Landfill (kg per capita)	Expected Diversion Potential (%)	Diversion Potential out of Landfill (kg per capita)
ICI	41%	Recycling Materials - Containers and Paper	45%	8.4	60%	11.3
		Depot Recyclable Material (EPR)	20%	1.6	40%	3.3
		Wasted Food	50%	25.4	61%	30.8
		Inedible Organic Materials	40%	10.6	50%	13.3
		Building Materials	20%	0.8	50%	1.9
		Textiles	30%	2.0	50%	3.3
		Bulky Objects	20%	0.1	40%	0.2
Total ICI Diversion Potential			48.9		64.0	
DO	16%	Containers and Mixed Paper Recyclables	20%	0.6	20%	0.6
		Depot Recyclables	30%	1.4	30%	1.4
		Wasted Food	10%	0.1	10%	0.1
		Inedible Organic Materials	10%	0.2	10%	0.2
		Building Materials	20%	2.2	50%	5.5
		Textiles	10%	0.4	30%	1.3
		Bulky Objects	20%	1.5	20%	1.5
Total DO Diversion Potential			6.4		10.5	
C&D	16%	Containers and Mixed Paper Recyclables	10%	0.0	30%	0.1
		Depot Recyclables	20%	0.3	40%	0.5
		Wasted Food	30%	0.0	30%	0.0
		Inedible Organic Materials	10%	0.1	10%	0.1
		Building Materials	20%	0.1	50%	0.3
		Textiles	30%	0.2	50%	0.3
		Bulky Objects	10%	0.2	20%	0.4
Total C&D Diversion Potential			0.9		1.7	
Resulting Per Capita Disposal Rate (kg/capita)			280		250	

Table 3-17 presents how material types were grouped for the diversion potential analysis. These groupings reflect groups of materials that are managed in a particular way – for example, material that is collected via curbside recycling is grouped together, since these materials could be targeted through improved residential recycling programs, and wasted food is separated from inedible organic materials, since wasted food may be targeted through waste reduction programs, while inedible organic materials may be targeted through organics diversion programs.

Table 3-17: Material Groupings

Category	Included Items (e.g.)
Curbside Recyclable Material (EPR) ¹²	Packaging and Printed Paper Materials that are collected from the residential sector (Managed by Recyclable BC)
ICI Recyclable Materials ¹	Packaging and Printed Paper Materials from the commercial sector
Depot Recyclable Material (EPR)	Deposit Containers, Electronics, Batteries, Used Oil, and Containers, etc.
Wasted Food	Edible or donatable food
Inedible Organic Materials	Inedible food scraps, yard waste, and compostable paper
Recyclable C&D Materials	Cardboard, Drywall, Masonry (concrete/asphalt), Clean Wood, and Metals
Textiles	All textiles
Bulky Objects	Furniture and Mattresses

4.0 PLAN MONITORING AND MEASUREMENT

4.1 Plan Monitoring Advisory Committee

A Plan Monitoring Advisory Committee (PMAC) will monitor the implementation of the plan and make recommendations to increase its effectiveness. A description of the PMAC tasks and make up will be included in a Terms of Reference, which will be developed upon Plan approval, and will be based on the template provided in the Ministry's Guide.

4.2 Annual Reporting

The CVRD will compile data from CVRD sites on all residual disposal activities in the regional district and provide annual information to the Ministry's online disposal calculator.

4.3 Five-Year Effectiveness Review

Five years from now, CVRD will carry out a review of the SWMP Update's implementation and effectiveness, as prescribed by the Ministry. This review should result in a report that is made publicly available but does not need to be submitted to the Ministry for approval. This review may include:

- Overview of all programs or actions undertaken in the first five years to support the plan's goals and targets, including status and implementation costs for each;
- Description and forecasted budget for programs or actions not yet started and status, including explanations

¹²Curbside Recyclable Material and ICI Paper and Printed Packaging are the *same materials*. In the residential sector, these materials are managed by Recycle BC. In the ICI sector, materials are not managed by a product stewardship program.

for delays or cancellations of plan components;

- Five-year trend information for waste disposal per person;
- Five-year trend of greenhouse gases emitted and avoided, if available; and
- Any significant changes that might impact the solid waste management system over the subsequent five years.

4.4 Waste Composition Studies

In advance of the five-year review noted, a waste composition study on the residual waste management stream is proposed for year 3 and year 5, if appropriate, in advance of the next SWMP Update to assess the success of current waste diversion programs and policies and identify opportunities for additional diversion.

4.5 Plan Flexibility and Risk

The SWMP lays out the high-level goals, costs, and timelines for solid waste program implementation in the CVRD. A number of factors may affect the cost and timeline to implement each strategy including external changes to priorities, partner programs, and regulations, hauler and depot-based collection and processing capacity, market fluctuations, and internal variations in priorities and availability of budget and staff time to implement programs. The SWMP is intended to be flexible in the implementation of plan components, either directly, or in cooperation with municipalities, or through private firms and/or non-profit organizations. While the SWMP provides flexibility in implementation depending on internal and external factors, the following risks should be considered:

- Achievement of the identified disposal targets is dependent on successful implementation of all strategies identified in Section 3.0;
- Costs provided are conceptual level estimates and may differ from the actual costs to implement programs depending on the details of program or infrastructure design and timing of implementation. As a result, major programs and infrastructure are expected to undergo further assessment prior to implementation;
- The success of items is dependent on allocation of resources to adequately design, implement, and assess programs;
- Several items are dependent on collaboration with local, regional, or provincial organizations which may experience changes in priority throughout the SWMP timeframe;
- The success of reduce, reuse, and recycle strategies can be leveraged for success by ensuring adequate resources for education and behaviour change programs;
- The Recycling Regulation is not easy to amend and additional EPR products may not be added in a timely manner; and
- The Ministry may require changes to the operation of regional disposal facilities through orders and updates to Permits and Operational Certificates which would impact the timelines and priorities for investment at disposal facilities.

Procedures may be needed to manage potential plan disputes that could arise throughout the process. Should there be any disputes related to the SWMP, the procedures in Appendix E - Plan Dispute Resolution Procedures will be utilized.

5.0 FINANCE AND ADMINISTRATION

5.1 Ten-Year Financial Plan

The strategies, actions and costs associated with meeting the targets have been discussed in previous sections and represent significant changes and improvements to the solid waste management system in the CVRD. This section of the plan presents a summation of the estimated costs (in 2018 dollars) to the CVRD for the proposed solid waste management system and addresses options for how the implementation of the Plan will be financed.

Table 5-1 provides a ten-year financial plan reflecting the proposed programs. This table was built with the assumption that the existing staff would integrate SWMP Update implementation into existing workplans. It should be noted that Federal and Provincial grants and funding programs will be pursued wherever possible and practical to reduce the cost-burden to local taxpayers.

Table 5-1: Ten Year Financial Plan

Year	1	2	3	4	5	6	7	8	9	10
CVRD FINANCIAL PLAN	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
REVENUE										
Debt Proceeds	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Grants	\$ 33,765	\$ 33,940	\$ 34,119	\$ 34,302	\$ 34,488	\$ 34,678	\$ 34,871	\$ 35,069	\$ 35,270	\$ 35,475
Other	\$ 929,977	\$ 943,280	\$ 956,756	\$ 970,470	\$ 984,406	\$ 998,569	\$ 1,012,959	\$ 1,027,582	\$ 1,042,444	\$ 1,057,548
Proposed Requisition/Parcel Tax	\$ 4,716,700	\$ 4,832,080	\$ 4,984,721	\$ 5,227,896	\$ 5,205,432	\$ 5,572,351	\$ 5,491,012	\$ 5,685,375	\$ 5,892,187	\$ 5,950,894
Surplus/(Deficit)	\$ 340,284	\$ 170,855	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transfer from Capital Reserve	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transfer from Operating Reserve	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
User Fee	\$ 3,964,624	\$ 4,012,670	\$ 6,904,030	\$ 6,973,792	\$ 7,045,146	\$ 7,119,128	\$ 7,192,770	\$ 7,269,105	\$ 7,347,164	\$ 7,426,984
TOTAL OPERATING REVENUE	\$ 9,985,350	\$ 9,992,805	\$ 12,879,626	\$ 13,206,260	\$ 13,269,472	\$ 13,723,726	\$ 13,731,612	\$ 14,017,131	\$ 14,317,065	\$ 14,470,901
EXPENDITURES										
Existing Operating Expenditures										
Curbside Collection - Garbage	\$ 781,205	\$ 796,829	\$ 812,765	\$ 829,020	\$ 845,601	\$ 862,514	\$ 879,764	\$ 897,359	\$ 915,306	\$ 933,612
Curbside Collection - Recycling	\$ 376,212	\$ 234,964	\$ 239,663	\$ 244,456	\$ 249,344	\$ 254,330	\$ 259,419	\$ 264,610	\$ 269,902	\$ 275,300
CVRD Internal Allocations	\$ 544,066	\$ 556,401	\$ 568,984	\$ 581,818	\$ 594,910	\$ 608,263	\$ 621,882	\$ 635,774	\$ 649,943	\$ 664,396
Debt	\$ 786,318	\$ 786,318	\$ 741,228	\$ 741,228	\$ 741,228	\$ 741,228	\$ 741,228	\$ 741,228	\$ 741,228	\$ 741,228
Garbage Disposal	\$ 2,455,344	\$ 2,504,451	\$ 2,554,540	\$ 2,605,631	\$ 2,657,744	\$ 2,710,899	\$ 2,765,117	\$ 2,820,420	\$ 2,876,828	\$ 2,934,365
Legal & Administrative	\$ 202,113	\$ 206,155	\$ 210,276	\$ 214,482	\$ 218,771	\$ 223,145	\$ 227,600	\$ 232,161	\$ 236,804	\$ 241,542
Operations - Disposal	\$ 2,994,462	\$ 2,935,359	\$ 2,992,066	\$ 3,049,908	\$ 3,108,908	\$ 3,169,087	\$ 3,230,466	\$ 3,293,076	\$ 3,356,937	\$ 3,422,075
Operations - Recycling	\$ 1,182,591	\$ 1,206,244	\$ 1,230,368	\$ 1,254,975	\$ 1,280,076	\$ 1,305,679	\$ 1,331,792	\$ 1,358,428	\$ 1,385,595	\$ 1,413,305
Planning, Operations Support, and Execution	\$ 117,224	\$ 119,568	\$ 121,960	\$ 124,399	\$ 126,887	\$ 129,424	\$ 132,012	\$ 134,652	\$ 137,345	\$ 140,090
Reduction and Recycling Programs	\$ 30,015	\$ 30,616	\$ 31,228	\$ 31,853	\$ 32,490	\$ 33,140	\$ 33,803	\$ 34,479	\$ 35,169	\$ 35,873
Transfer to Reserve	\$ 320,000	\$ 324,000	\$ 328,080	\$ 332,242	\$ 336,487	\$ 340,817	\$ 345,231	\$ 349,738	\$ 354,333	\$ 359,020
Total Annual Existing Operating Expenditures	\$ 9,789,550	\$ 9,700,905	\$ 9,831,158	\$ 10,010,012	\$ 10,192,446	\$ 10,378,526	\$ 10,568,325	\$ 10,761,925	\$ 10,959,390	\$ 11,160,807
Existing Capital Expenditures	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Annual Existing Capital Expenditures	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Existing Expenditures	\$ 9,789,550	\$ 9,700,905	\$ 9,831,158	\$ 10,010,012	\$ 10,192,446	\$ 10,378,526	\$ 10,568,325	\$ 10,761,925	\$ 10,959,390	\$ 11,160,807
PROPOSED Operating Expenditures										
01 Enhance Reduce and Reuse Potential	\$ 18,000	\$ 36,000	\$ 21,000	\$ 3,000	\$ 3,000	\$ 20,000	\$ -	\$ -	\$ -	\$ -
02 Reduce Disposal from ICI and Multi-Family Residential	\$ 5,000	\$ 17,500	\$ 45,000	\$ 20,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
03 Reduce Disposal from Residential Sector	\$ 15,000	\$ 15,000	\$ 2,895,348	\$ 2,739,248	\$ 2,784,026	\$ 2,829,700	\$ 2,876,287	\$ 2,923,806	\$ 2,972,275	\$ 3,021,714
04 Improve Organics Processing	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
05 Investigate Processing and Transfer Capacity for ICI Recyclable	\$ -	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
06 Improve Management of Construction and Demolition Material	\$ -	\$ -	\$ 100,000	\$ 115,000	\$ 115,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
07 Explore Options for Local Disposal	\$ 20,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
08 Reduce Illegal Dumping	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
09 Implement Collection/Drop off For HHW, Bulky Items, and Or	\$ -	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000
10 Monitor Historic Disposal Sites	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
11 Implement Asset Management Plan	\$ 122,800	\$ 8,400	\$ 12,120	\$ 144,000	\$ -	\$ 220,500	\$ 12,000	\$ 56,400	\$ 110,400	\$ 13,380
12 Develop a Disaster Debris Management Plan	\$ -	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
13 Integrate Education and Behaviour Change Best Practices	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Annual Proposed Operating Expenditures	\$ 195,800	\$ 291,900	\$ 3,048,468	\$ 3,196,248	\$ 3,077,026	\$ 3,345,200	\$ 3,163,287	\$ 3,255,206	\$ 3,357,675	\$ 3,310,094
PROPOSED Capital Expenditures										
No proposed capital expenditures	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Annual Proposed Capital Expenditures	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Annual Proposed Expenditures	\$ 195,800	\$ 291,900	\$ 3,048,468	\$ 3,196,248	\$ 3,077,026	\$ 3,345,200	\$ 3,163,287	\$ 3,255,206	\$ 3,357,675	\$ 3,310,094
TOTAL OPERATING EXPENDITURES	\$ 9,985,350	\$ 9,992,805	\$ 12,879,626	\$ 13,206,260	\$ 13,269,472	\$ 13,723,726	\$ 13,731,612	\$ 14,017,131	\$ 14,317,065	\$ 14,470,901
TOTAL CAPITAL EXPENDITURES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL EXPENDITURES	\$ 9,985,350	\$ 9,992,805	\$ 12,879,626	\$ 13,206,260	\$ 13,269,472	\$ 13,723,726	\$ 13,731,612	\$ 14,017,131	\$ 14,317,065	\$ 14,470,901
Additional Requisition Required	\$ 195,800	\$ 291,900	\$ 353,120	\$ 487,000	\$ 293,000	\$ 515,500	\$ 287,000	\$ 331,400	\$ 365,400	\$ 288,380
Additional User Fee Required	\$ -	\$ -	\$ 2,695,348	\$ 2,739,248	\$ 2,784,026	\$ 2,829,700	\$ 2,876,287	\$ 2,923,806	\$ 2,972,275	\$ 3,021,714
Revenues - Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

6.0 PLAN SCHEDULE

Table 6-1 provides the planned implementation schedule for the Solid Waste Management Plan from 2019 to 2028.

Table 6-1: Implementation Schedule

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
01 Enhance Reduce and Reuse Potential										
A Reduce Wasted Food from Residential and Industrial, Commercial, and Institutional (ICI) Sectors										
B Enhance and Improve Local Reuse Opportunities										
C Support Bans on Single-Use Plastic Bags or Other Single-Use Items										
D Advocate for Expansion of EPR Programs										
02 Reduce Disposal from ICI and Multi-Family Residential										
A Mandate Source Separation for Multi-family and ICI										
B Adopt a Full Organics Disposal Ban and Enhance Enforcement of Existing Material Disposal Bans										
03 Reduce Disposal from Residential Sector										
A Assess Opportunities for Access to Recycling Programs at Depots										
B Adopt Universal Curbside Collection Services Across the Region										
04 Improve Organics Processing										
A Ensure Use of Best Management Practices for Odour Management										
B Ensure Capacity for Local Organics Processing										
05 Investigate Processing and Transfer Capacity for ICI Recyclables										
A Perform a Feasibility Assessment for Development of ICI Transfer Capacity										
06 Improve Management of Construction and Demolition Materials										
A Monitor C&D Disposal and Recycling Activities in the Region										
B Develop a C&D Waste Management Strategy										
C Reduce Barriers to Disposing Hazardous Materials (asbestos, gypsum wallboard)										
07 Explore Options for Local Disposal										
A Explore Options for Local Disposal										
B Explore and Amend Tipping Fee										
08 Reduce Illegal Dumping										
A Augment Illegal Dumping Prevention Strategies										
09 Implement Collection/Drop off For HHW, Bulky Items, and Organics										
A Implement Collection for HHW										
B Improve Recycling Opportunities for Bulky Items										
C Assess Effective Ways to Reduce Open Burning of Wood Waste										
10 Monitor Historic Disposal Sites										
A Monitor Historic Disposal Sites										
11 Implement Asset Management Plan										
A Implement Asset Management Plan										
B Develop Bings Creek Transfer Station 10-Year Plan										
12 Develop a Disaster Debris Management Plan										
A Develop a Disaster Debris Management Plan										
13 Integrate Education and Behaviour Change Best Practices										
A Consider Best Management Practices for Education and Behavior Change Programs										
B Continue to support Zero Waste Events Program										

7.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

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APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

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The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

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In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX B

STATUS OF 2006 SWMP UPDATE INITIATIVES

Solid Waste Management Plan Amendment No. 3 (2006) contains 54 planned initiatives relating to regulations, waste reduction, reuse, recycling, recovery, and residual waste management. Initiatives from each category are outlined in the table below along with comments on implementation. The status of each initiative is classified as one of the following:

- Complete: Item has been implemented or addressed and no further action is required;
- In-Progress: Item has been started and more effort is required to complete;
- Ongoing: Item has been implemented and is part of regular business;
- Incomplete / On-Hold: Item should be revisited and either cancelled or carried into the upcoming SWMP Amendment; and
- Cancelled: Item is no longer relevant or applicable.

Planned Initiative	Status
2.3 Regulation of Solid Waste Management System	
Final Adoption and implementation of CVRD Bylaw No. 2020 in 2007, with education and enforcement measures to support as required	Complete
Continued implementation of CVRD Bylaw No. 2570. Subsequent to issuing the majority of licenses for existing waste management facilities by early 2007, the CVRD will direct waste materials to licensed facilities only and proceed with enforcement measures against unlicensed facilities, in accordance with the Enforcement Policies and Procedures document. A list of facilities holding valid waste stream licenses will be maintained on the CVRD website, as will any facilities in non-compliance	Complete
Sustained, progressive enforcement of the material ban provisions of CVRD Bylaw No. 2108, with targeting of materials and generating sectors to be determined through observation of the incoming residual waste stream	On-hold, pending Bylaw review
Evaluate the impacts of expanding the commercial food waste ban provisions of CVRD Bylaw No. 2108 to include post-consumer commercial food waste (i.e. restaurant plate scrapings etc.), and de-packaging where feasible, with possible implementation to follow	On-hold, pending Bylaw review
Ongoing evaluation of the effectiveness of the existing regulatory structure in achieving CVRD waste management objectives. Development of new or expanded bylaws may be initiated in response to identified needs.	Ongoing
2.4 Waste Reduction	
Publish the Environmental Guide and Recycling Directory primarily in an on-line format. The Guide will also be printed and distributed locally on a periodic basis;	Complete
Publication of Earth Issues, Our Lifestyles and the Environment, a CVRD- produced environmental education manual targeting Kindergarten to Grade 5 students	Complete
Continued efforts to minimize the amount of waste generated by internal CVRD operations, which may include development of an Environmental Management System	Cancelled
2.5 Reuse	
Promotion of material and product reuse and repair opportunities available within the Cowichan region through the Environmental Guide and Recycling Directory and CVRD Recycling Hotline	Complete
Support for the Cowichan Recycling Exchange service offered in partnership with Cowichan News Leader/ Pictorial newspaper and promotion of the RCBC Materials Exchange, and other such waste exchanges	Complete
Implementing a trial period for 'Free Store' facilities at the Bings Creek Solid Waste Management Complex and the Peerless Road Recycling Drop-off Depot where unwanted, but useable items can be placed for removal and reuse by others	Complete

Planned Initiative	Status
2.6 Recycle	
Promotion of Recycling Opportunities	
Outreach and education efforts focused around planned CVRD programs diverting food waste from the residential and commercial residual waste streams	Ongoing
Promotion of any new opportunities for material recycling at CVRD-operated or privately operated solid waste facilities	Ongoing
Evaluate the need for a region-wide initiative to support private haulers and local municipalities in promoting and delivering recycling services to multi-family dwellings	On-hold pending further review
Promotion of free yard and garden tipping at CVRD facilities and other alternatives to burning yard waste	Ongoing
Focused efforts to optimize participation in curbside recycling programs	Complete
Curbside Recycling Collection Programs	
Pending support from member municipalities, the CVRD will evaluate the feasibility of collectively tendering all contracted-out curbside-collection contracts within the region so that the CVRD and local municipalities may benefit from a 'buying in bulk' approach	Cancelled
The CVRD will evaluate the feasibility of integrating residential food waste collection with existing curbside waste and recycling collection programs within the region. Evaluation will be conducted in partnership with local municipalities, industry stakeholders, and rural and urban residents	In-Progress
If the feasibility of a food waste collection services can be established, the CVRD will pursue region-wide implementation of residential food waste collection	On-hold
Multi-Product Neighbourhood Recycling Bins	
The CVRD will evaluate phasing-out the Multi Bin Program in the 2008 to 2012 period. If the region-wide program is discontinued, multi bins, or similar equipment, will remain in place at CVRD Recycling Drop-off Depots	Complete
Commercial & Multi-Family Recycling	
Continue to emphasize the existing material ban provisions of CVRD Bylaw No. 2108 to encourage local businesses to make use of recycling opportunities	Ongoing
Evaluate the impact on the hauling sector and local business community of expanding the commercial food waste ban to include post-consumer food waste	On-hold
In consultation with local municipalities and local haulers, the CVRD will evaluate the need for new initiatives targeting increased waste diversion from the commercial and multi-family sectors.	On-hold
CVRD Recycling Facilities	
Develop "Free Side" and "Paid Side" Traffic Streams. In order to maximize convenience for residents accessing CVRD recycling facilities, the CVRD will assess the feasibility of modifying traffic flow at CVRD recycling sites to allow residents to drop off free recyclable materials without requiring these materials to cross the scale	Complete
Food Waste Tipping and Transfer Area. In support of upcoming CVRD initiatives targeting diversion of food waste, a dedicated tipping area will be developed at Bings Creek for transfer of large quantities of organic waste. A container for drop off of residential organics will also be provided at Bings Creek	Complete
On-site material processing. Consistent with the CVRD's intention to minimize the cost of hauling recyclable materials collected at CVRD facilities, the CVRD will evaluate the feasibility of providing on-site processing at Bings Creek for some materials. Materials being considered for some on-site processing are wood waste, yard and garden waste, and food waste, amongst others.	Complete
Develop a South-end Depot. To ensure that Cobble Hill, Mill Bay, Shawnigan Lake and Cowichan Bay residents have convenient local access to recycling facilities, the CVRD will develop a full-service waste recycling drop-off depot in the southern part of the region.	On-hold
Improved recycling infrastructure. The CVRD plans to re-develop the west side of the residential tipping area at Bings Creek to facilitate recycling. Planned improvements include: installing a stationary	Complete

Planned Initiative	Status
compactor for management of cardboard; providing a permanent building for the Free Store; improved enclosures for management of hazardous materials.	
Multi-Material Recycling	
The CVRD will encourage sound environmental management at Vancouver Island Recycling Centre, consistent with the standards in place for licensed facilities	Cancelled
The CVRD will continue to support private sector materials recovery facilities through the ongoing expansion of recycling programs	Ongoing
Construction & Demolition Waste	
The CVRD will continue to promote opportunities for residents to use licensed private C&D waste processing facilities	Ongoing
The CVRD will support licensed C&D recycling facilities through pursuing enforcement measures against unlicensed facilities	Ongoing
In co-operation with its member municipalities and the building trades, the CVRD will develop a requirement that construction and demolition projects provide the opportunity for salvage of materials	On-hold pending feasibility review
The CVRD will seek agreements with its member municipalities to ensure that specific sorting and waste segregation requirements are applied following material salvage. This agreement would be a condition of all new building construction and demolition permits issued within the CVRD boundaries. The CVRD will develop program guidelines to assist local builders in establishing effective site sorting techniques and waste reduction programs.	On-hold pending feasibility review
Landclearing Debris	
In support of ongoing efforts to improve local air quality, the CVRD will promote non-burning management practises, such as mulching and composting, for locally generated landclearing debris. The CVRD will also enforce the provisions of CVRD Bylaw No. 2020, which regulate open burning of landclearing debris	Ongoing
Composting	
Continue to hold a sale of backyard composters every second year with the cost to residents for each unit significantly subsidized by the CVRD	Cancelled
Year-round free tipping of yard and garden waste at CVRD Recycling Drop-off depots	Ongoing
Support licensed composting facilities through development of curbside food waste collection services. Prior to developing this service, the CVRD will evaluate the capacity of local composting facilities to accept materials collected through this service	In-Progress
Enforce CVRD Bylaw No. 2108 prohibitions on disposal of commercial organic waste	On-hold pending Bylaw review
Improve tipping and transfer of residential and commercial food waste at Bings Creek	Complete
Hazardous Materials	
Cooperating and assisting with the promotion of provincial initiatives	Ongoing
Incorporating household hazardous waste into the overall education and partnership programming	Ongoing
Promoting waste exchanges and swap days for materials, such as paint, that are developed by local community groups or provincial manufacturing associations	N/A
2.7 Recovery	
To evaluate the feasibility of the three types of technology – Gasification, Refuse Derived Fuel, and Waste-to-Energy processes, considered most likely to be a viable option for managing CVRD / RDN residual waste	Complete
Evaluate each technology's potential markets for producing fuel, power, steam or other products from the residual waste streams	Complete
To identify considerations and a time frame for initiating a Request for Proposals process for selecting a specific waste management technology.	Cancelled
2.8 Residual Waste Management	
Residual Waste Collection	
Encourage member municipalities to implement further can limits and/or reduced collection frequency	Cancelled

Planned Initiative	Status
Apply enforcement of material bans (i.e. yard waste) to municipal collection crews	Ongoing
Support and assist local municipalities in integrating food waste collection into their existing waste collection protocols	Cancelled
Residual Waste Transfer	
Provide capacity for drop-off of self-hauled residual waste at the planned South-end Recycling Drop-off Depot.	Cancelled
The CVRD will evaluate the feasibility of, and possibly develop, a residual waste tipping area for residential and small commercial self-haul customers adjacent to the main tipping floor	Complete
The CVRD will evaluate the benefits of cost savings and operational flexibility that may result from purchasing a roll off truck and containers for local materials transfer. If cost savings can be established, the CVRD may proceed with vehicle purchase or lease	Complete
Non-CVRD Residual Disposal	
The CVRD will continue to monitor the flow of residual waste from the region. If ongoing evaluation indicates that the CVRD's overall objectives for management of regional solid waste are compromised by changes in private sector disposal practices, the CVRD will consult with local industry regarding regulatory and non-regulatory approaches to discouraging use of non-CVRD disposal facilities.	On-hold
Illegal Residual Waste Disposal	
The CVRD will continue to offer all existing programs to reduce the prevalence of illegal dumping within the CVRD. Following the completed closure of CVRD ash landfills, the CVRD will initiate investigations of the illegal dump sites and develop an overall strategy for their closure.	Complete

APPENDIX C

SWMP TECH MEMOS

Technical Memorandum 1

Current Solid Waste Management System Overview

Solid Waste Management Plan Update Technical Memo 1: Current Solid Waste Management System Overview



PRESENTED TO
Cowichan Valley Regional District

OCTOBER 17, 2018
ISSUED FOR USE
FILE: 704-SWM.PLAN03006-01

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APPENDICES

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Acronyms/Abbreviations	Definition
ACM	Asbestos-Containing Materials
AVCC	Association of Vancouver Island Coastal Communities
Bings Creek	Bings Creek Recycling Centre & Garbage Drop-Off Depot
C&D	Construction and demolition
CRD	Capital Regional District
CVRD	Cowichan Valley Regional District
DO	Drop-off
Duncan	City of Duncan
EMA	Environmental Management Act
EPR	Extended Producer Responsibility
Guide	"A Guide to Solid Waste Management Planning," published by the BC Ministry of Environment and Climate Change in 2016
ICI	Industrial, Commercial, and Institutional
Ladysmith	Town of Ladysmith
Lake Cowichan	Town of Lake Cowichan
Meade Creek	Meade Creek Recycling Centre & Garbage Drop-Off Depot
MF	Multi-family
Ministry	British Columbia Ministry of Environment and Climate Change
MRF	Material Recycling Facility
MSW	Municipal solid waste
MTSA	Municipal Type Service Agreement
North Cowichan	District of North Cowichan
PAC	Plan Advisory Committee
Peerless Road	Peerless Road Recycling Centre & Garbage Drop-Off Depot
PM _{2.5}	Atmospheric particulate matter that has a diameter of less than 2.5 micrometers.
R	The 5 "R"s of the Pollution Prevention Hierarchy: reduce, reuse, recycle, recover, residuals management.
RAPP	Report All Poachers and Polluters
RD	Regional District
RDN	Regional District of Nanaimo
Recycling Centres	Refers to Bings Creek, Meade Creek, and Peerless Road
SF	Single family
SWMP	Solid waste management plan

To:	Tauseef Waraich, CVRD	Date:	October 17, 2018
c:	Harmony Huffman, CVRD	Memo No.:	1
From:	Wilbert Yang Melissa Nielsen	File:	704-SWM.PLAN03006-01
<hr/>			
Subject:	Current Solid Waste Management System Overview		

1.0 INTRODUCTION

The Cowichan Valley Regional District (CVRD) retained Tetra Tech Canada Inc. (Tetra Tech) to assist the CVRD in updating their solid waste management plan (SWMP). Updating the SWMP requires: (1) reviewing the existing solid waste management system, policies and programs, (2) identifying and evaluating options for reduction, diversion, residual management, and financing, and (3) developing and setting waste management principles, targets and strategies for the next ten years.

Using the baseline information provided by CVRD, this technical memorandum examines the existing solid waste management system, policies and programs, and discusses some of the potential options that the CVRD may be considering for the updated SWMP.

1.1 Solid Waste Management Plans

Regional Districts in British Columbia (BC) are required to prepare SWMPs. In 1989, the *Waste Management Act* [now the *Environmental Management Act* (EMA)] was amended to require all regional districts to prepare and submit solid waste management plans to the BC Ministry of Environment and Climate Change Strategy (Ministry) for approval. The purpose of the SWMP is to provide a guiding document that will indicate the Region's solid waste management activities over the next 5 to 10 years. The plan should outline a framework for managing solid waste in the region while keeping in mind local circumstances, community goals, disposal capacity, environmental protection, community support, operational capacity and financial sustainability.

1.2 Guiding Principles

The Ministry released a planning guide entitled, "A Guide to Solid Waste Management Planning" (Guide) in 2016. These guidelines will be used to update the CVRD's SWMP.

According to the Ministry's guidelines, the SWMP should be founded on locally-relevant guiding principles, which should be clearly stated in the plan. These principles will be developed in consultation with an advisory committee and also factor in provincial guiding principles, which are summarized in Figure 1-1 and described below. If the provincial guiding principles are modified or not included, a clear rationale for these decisions should be provided to the Ministry.



Figure 1-1: Provincial Guiding Principles

- **Promote zero waste approaches and support a circular economy.**

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

- **Promote the first 3 Rs (reduce, reuse and recycle).**

Elevate the importance of waste prevention by prioritizing programming and provision of services for the first 3 Rs in the 5 R waste management hierarchy, presented in Figure 1-2. Encourage investments in technology and infrastructure, and ensure they occur as high up on the hierarchy as possible.



Figure 1-2: The Pollution Prevention Hierarchy

Source: (BC Ministry of Environment and Climate Change Strategy, n.d.¹)

- **Maximize beneficial use of waste materials and manage residuals appropriately.**
Technology, best practices and infrastructure investments should continue to develop to recover any remaining materials and energy from the waste stream, and to manage residuals for disposal.
- **Support polluter and user-pay approaches and manage incentives to maximize behaviour outcomes.**
Producer and user responsibility for the management of products can be supported through the provision of market-based incentives, disposal restrictions on industry-stewarded products, zoning to support collection facilities, and support for reuse and remanufacturing businesses. Education and behaviour change strategies aimed at consumers and businesses will help foster further waste reduction, reuse and recycling. For example, user fees can be managed as incentives to increase waste reduction and diversion.
- **Prevent organics and recyclables from going into the garbage wherever practical.**
Maintaining a system to prevent organics and recyclables from going into the garbage will provide clean feedstock of greater economic value as well as a potential end product use to the recycling industry, while reinforcing behaviour to reduce, reuse and recycle. Innovation in separation solutions, establishment and enforcement of disposal restrictions or other creative means will influence this approach.
- **Collaborate with other regional districts wherever practical.**
Collaboration on many aspects of solid waste management (e.g., to access facilities and markets, share campaigns and programs) will support the most efficient and effective overall municipal solid waste system.
- **Develop collaborative partnerships with interested parties to achieve regional targets set in plans.**
Strengthen partnerships with interested parties to achieve regional targets. All waste and recycling service providers, industry product stewards and waste generators are key interested parties in achieving these targets. Cooperative efforts will optimize successful outcomes. Encourage a marketplace that will complement stewardship programs and drive private sector innovation and investment towards achievement of targets.
- **Level the playing field within regions for private and public solid waste management facilities.**
Solid waste management facilities within a given region should be subject to similar requirements. A consistent set of criteria should be used to evaluate the waste management solutions proposed by private sector and by a regional district or municipality

¹ <http://www2.gov.bc.ca/gov/content/environment/waste-management/zero-waste>

Supporting guiding principles outlined by the CVRD in the 2006 SWMP include:

- Support local industry.
- Engagement with local municipalities.
- Engagement with local First Nations.
- Support extended producer responsibility (EPR) initiatives.
- Use economic instruments for achieving waste diversion.
- Promote sound environmental management practices.

1.3 Provincial Goals and Targets

The Ministry has three targets that are encouraged when regional districts are developing strategies and actions for their SWMPs.

- **75% of BC's Population covered by Organic Waste Disposal Restrictions.** The Ministry set a target to have 75% of the population in BC covered by an organic waste disposal restriction by 2020.
- **75% Recovery of Materials Covered by Extended Producer Responsibility Programs.** Through the Recycling Regulation, the Ministry oversees an EPR program that sets 75% recovery targets for products covered through the program (e.g., beverage containers, packaging and printed paper, electronics, and other items).
- **Provincial Disposal Rate of 350 kg per capita, per year.** The Ministry has set a target to reduce the annual per person disposal rate from 550 kg per capita to 350 kg per capita over the next 10 years, by 2028, through a phased approach. Phasing implementation will optimize existing and implement new waste reduction and diversion programs with the capacity to reduce disposal per capita.

1.4 The Plan Update Process

The process that will be used to review and update the CVRD SWMP is presented in Figure 1-3, along with proposed public consultation steps.

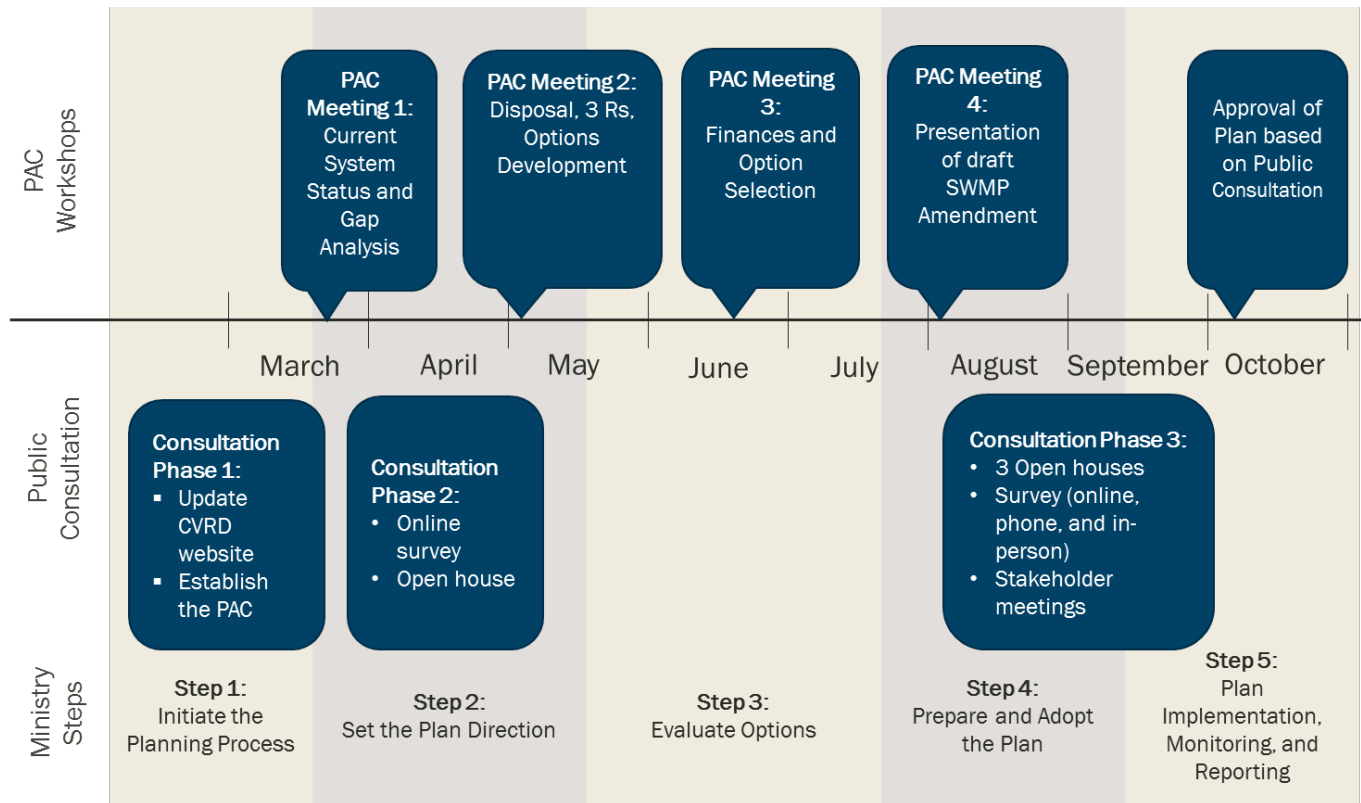


Figure 1-3: Steps of SWMP Update

As outlined in Figure 1-3, the steps outlined in the Ministry's Guide will be applied to the SWMP update process in the CVRD as follows:

1. During the first step, the CVRD updated their website with information about the SWMP Update and established a plan advisory committee (PAC). This step occurred in early February and March 2018.
2. During the second step, the PAC will convene and be presented with Current Solid Waste Management Overview (this document). An online survey will be posted and an open house will be held to educate the broader public about the SWMP Update process and the CVRD's solid waste management system.
3. During the third step, two PAC meetings will be held to discuss options for focus in the CVRD SWMP Update.
4. During the fourth step, the draft SWMP Amendment will be prepared and presented at a fourth PAC meeting. Input will be gathered from the broader public via three open houses and a survey.
5. A fifth PAC meeting may be held to discuss amendments to the draft SWMP Update after public consultation. Finally, the 2018 SWMP Update for submission to the Ministry for approval.

This process is expected to consist of four or five PAC meetings. A report will be prepared for each PAC meeting to assist the PAC with their deliberations.

Table 1-1: PAC Meetings in SWMP Amendment Process

	PAC Meeting Topic	Corresponding Prepared Document
1	Current System Status and Gap Analysis	Technical Memorandum (this document)
2	Disposal, 3Rs, Options Development	Technical Memorandum
3	Finances and Option Selection	Technical Memorandum
4	Presentation of draft SWMP amendment and Consultation Plan	Draft SWMP Amendment
5	Approval of Plan based on Public Consultation (to be confirmed)	SWMP Amendment

Stakeholder and community consultation will take place throughout the SWMP update process to engage the public, key stakeholders, and First Nations to provide input on the selected options in the draft SWMP. The consultation plan will take place in three phases, as presented in Table 1-2.

Table 1-2: Consultation Plan

Phase	Timeline	Tasks
1	Before first PAC meeting	<ul style="list-style-type: none"> Post information about CVRD SWMP Update on website Establish the PAC
2	Between first and second PAC meeting	<ul style="list-style-type: none"> Online survey to gauge public support and priorities Open house to advise planning process and gauge public perception
3	After development of draft SWMP	<ul style="list-style-type: none"> Open houses to review initiatives being considered Public feedback through survey (online, phone, and in-person) Stakeholder meetings

2.0 BACKGROUND

This section discusses the historical and current state of solid waste management in the CVRD.

2.1 Plan History

The first SWMP was submitted to the Ministry in November 1995. Since then, the SWMP has undergone three major amendments which took place in 1997, 2002, and 2006. A five-year review of the 2006 SWMP was completed in 2011, and it found that no major changes in direction were required. The majority of initiatives identified within the current SWMP are complete or have been incorporated into the CVRD's day-to-day operations as ongoing items.

Table 2-1 presents the highlights of these initiatives. Appendix B presents all options identified in the plan and implementation progress at the time of writing.

Table 2-1: Highlights of 2006 SWMP Initiatives

Planned Initiative Group	Highlights
Regulation of Solid Waste Management System	<ul style="list-style-type: none"> Adopted and implemented CVRD Bylaw No. 2020 and Bylaw No. 3716 <ul style="list-style-type: none"> Prohibits open burning of landclearing debris and restricts backyard burning of yard waste Continued implementation of CVRD Bylaw No. 2570 <ul style="list-style-type: none"> Issuance and enforcement for licensing of solid waste facilities
Waste Reduction	<ul style="list-style-type: none"> Published the Environmental Guide and Recycling Directory online Published an environmental education manual for students
Reuse	<ul style="list-style-type: none"> Promotion of opportunities for reuse and repair Implemented 'Free Stores' at Bings Creek and Peerless Road
Recycle	<ul style="list-style-type: none"> Focused efforts to optimize participation in curbside recycling programs Phased out the Multi-Product Neighbourhood Recycling Bin Program Emphasized the existing material ban provisions of CVRD Bylaw No. 2108 to encourage local businesses to make use of recycling opportunities (ongoing) Developed a dedicated Food Waste Tipping and Transfer Area at Bings Creek Evaluated feasibility for the provision of on-site processing at Bings Creek Redeveloped the west side of the residential tipping area at Bings Creek Promoted licensed private waste management facilities to residents Provided enforcement measures against unlicensed facilities Promotion of non-burning management practices for land-clearing materials Introduced year-round free tipping of yard and garden waste at CVRD Recycling Centres Improved tipping and transfer of residential and commercial food waste at Bings Creek
Recovery	<ul style="list-style-type: none"> Evaluated feasibility for technologies to manage CRD, CVRD & RDN residual waste and evaluation of the technology's potential markets for producing fuel, power, steam or other products
Residual Waste Management	<ul style="list-style-type: none"> Evaluated feasibility for a residual waste tipping area for residential and small commercial self-haul customers adjacent to the main tipping floor at Bings Creek Purchased a roll off truck and containers for local materials transfer Launched an illegal dumping prevention campaign in partnership with the Association of Vancouver Island Coastal Communities (AVICC) Updated Free Tipping policy to support illegal dumping clean-up

2.2 Plan Area

The CVRD is one of 27 regional districts in British Columbia. It covers a land area of 3,473.12 km² on the east coast of Vancouver Island and includes several Gulf Islands, including Thetis, Kuper, and Valdes. The CVRD is comprised of nine electoral areas and four municipalities: the City of Duncan (Duncan), the Town of Ladysmith (Ladysmith), the Town of Lake Cowichan (Lake Cowichan), and the District of North Cowichan (North Cowichan). The regional district offices are in Duncan. Figure 2-1 is a map of CVRD; Appendix D contains several maps of CVRD with details about the solid waste management system.



Figure 2-1: Map of Cowichan Valley Regional District

2.3 Demographic Information

The CVRD has a population of 83,739 residents that reside in four unique municipalities, nine Electoral Areas, and ten First Nations. Of these residents, approximately 55% reside within municipalities, 40% reside in Electoral Areas, and 5% of residents live on First Nations Reserves. The CVRD's largest population centres are North Cowichan (29,676) and Ladysmith (8,537). Demographic information for the CVRD is presented in Table 2-2.

Table 2-2: Regional Demographic Information

Area	Population (2016)	Population Rate of Growth, 2011 - 2016	Population Density per square kilometre	Land Area in square kilometres
CVRD	83,739	4.2%	24.1	3,474.52
Electoral Area A	4,733	7.7%	96.0	49.31
Electoral Area B	8,558	5.3%	27.9	306.47
Electoral Area C	5,019	4.6%	222.2	22.59
Electoral Area D	3,243	9.2%	207.4	15.64
Electoral Area E	4,121	6.9%	30.6	34.85
Electoral Area F	1,629	-1.2%	0.9	1,792.34
Electoral Area G	2,325	4.7%	7.9	294.65
Electoral Area H	2,446	4.9%	29.4	83.09
Electoral Area I	1,206	8.6%	2.4	505.80
City of Duncan	4,944	0.2%	2,387.1	2.07
District of North Cowichan	29,676	3.0%	151.7	195.56
Town of Lake Cowichan	3,226	8.5%	389.3	8.29
Town of Ladysmith	8,537	7.8%	711.9	11.99
First Nations Reserves ²	4,076	-	-	-

¹ Statistics Canada. 2017. Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa a. Released October 25, 2017.

² Detailed data is not provided as the communities are excluded from the Plan Area.

The average population density in the CVRD is 24.1 persons per square kilometre, however, this varies greatly between communities. Duncan has the highest population density at 2,387.1 persons per square kilometre. Most CVRD residents live on the eastern side of the region along the TransCanada Highway. The regional population density is illustrated in Map 2 in Appendix D.

Between 2011 and 2016, the regional population growth rate was 4.2%, which is lower than the provincial population growth rate of 5.6%. Electoral Area D (Cowichan Bay) and Lake Cowichan saw the greatest population growth from 2011 to 2016, at 9.2% and 8.5%, respectively.

Approximately 10% of residences in the CVRD are multi-family (MF) residences, most of which are in North Cowichan and Duncan. The average household size in the region is 2.3 persons per household.

2.3.1 Economic Information

Income distribution in the CVRD is similar to the province as a whole with proportionally less low-income individuals than average and more higher income individuals than average, as presented in Figure 2-2.



Figure 2-2: Individual Income for CVRD and BC

The median after-tax income of households in the CVRD in 2015 was \$57,783. Median household incomes are highest in Electoral Areas A, B and C, averaging \$68,149 in 2015, as presented in Figure 2-3. Median after-tax household incomes in 2015 were lowest in Electoral Area I and in Duncan.

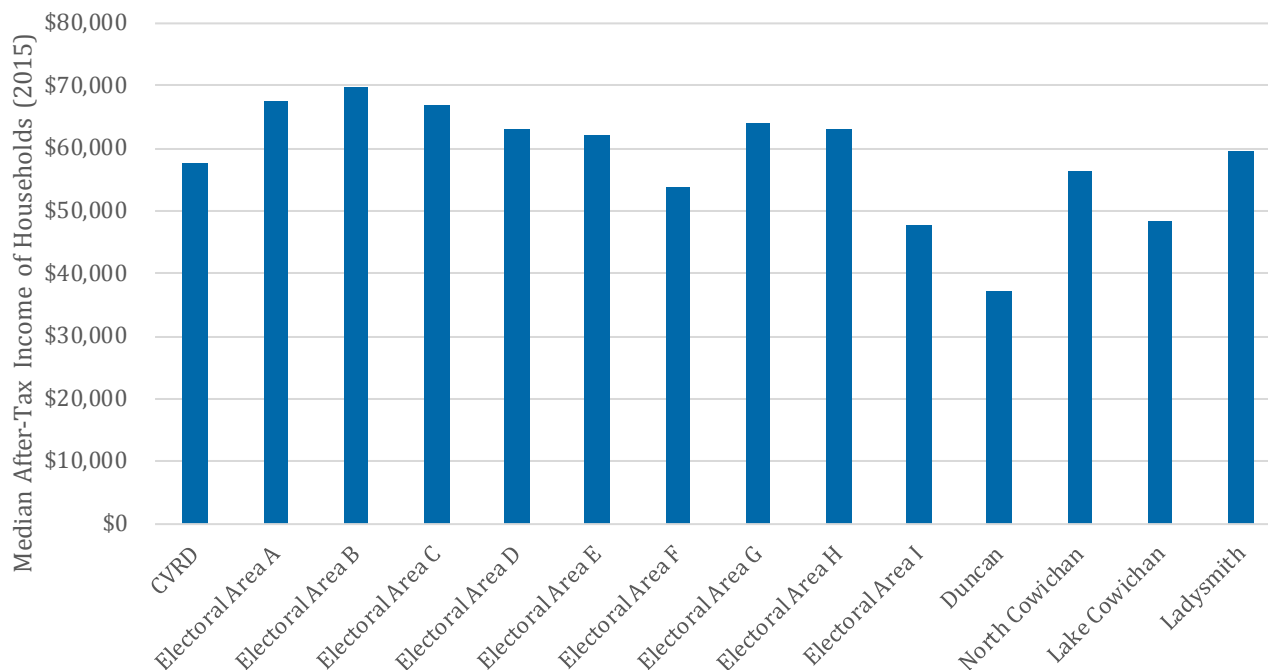


Figure 2-3: Household Income

2.3.2 First Nations

The CVRD encompasses traditional territories of 10 First Nations in 16 Indian Reserves in the Coast Salish and Nuuchah-nulth tribal regions. Although not part of the plan area, First Nations communities rely on regional solid waste services and infrastructure including waste transfer stations and Recycling Centres. The CVRD maintains Municipal Type Service Agreements (MTSAs) with some local First Nations for use of this infrastructure, while other First Nations communities use the services on an informal basis. Two closed landfill sites are located on Cowichan Tribes Reserve lands.

2.4 System Data

This section provides general data associated with the performance of the existing system, including the quantity and types of waste disposed. 2016 data is used as it is the most recently available data.

2.4.1 Disposal and Recycling Data

In 2016, an estimated 30,100 tonnes of waste were disposed from within the region, which amounts to a disposal rate of 359 kg per capita. The total amount of materials recycled (including organic materials) was approximately 44,000 tonnes, which amounts to a recycling rate of 525 kg per capita. Figure 2-4 presents the historical disposal and recycling rates for the region. These quantities represent amounts which are disposed at public and licensed private facilities in CVRD, and include material received from First Nation communities². Preliminary reports suggest that 2017 regional waste tonnages will be similar to 2016; recycling data for 2017 is not yet available.

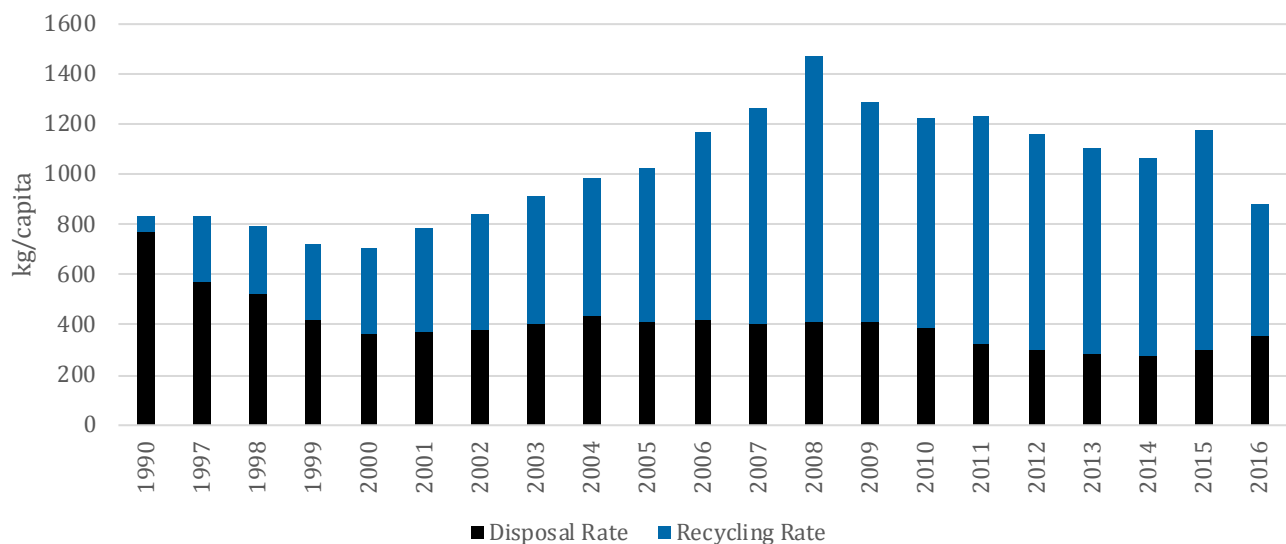


Figure 2-4: Per-Capita Disposal and Recycling Rate¹

Notes:

1. Fluctuations in recycling quantities reflect changes in reporting methodology related to external factors

² Material delivered to the CVRD Bings Creek from First Nation's communities in 2017 included 987 tonnes of waste and 87 tonnes of recyclables (PPP, organics, and other items).

The waste quantities presented in Figure 2-4 represents waste generated by several sectors:

- Single-family (SF) and Multi-family (MF) residential;
- Industrial, commercial, and institutional (ICI);
- Drop-off; and
- Construction and demolition (C&D).

Most materials disposed in the CVRD are taken at public facilities (22,000 tonnes out of 30,100 tonnes total).

Table 2-3 summarizes the amount of waste disposed by each sector in the CVRD in 2016. As presented in Table 2-3, the ICI sector disposes the most materials (over 12,000 tonnes), followed by the C&D sector (4,816 tonnes) and the DO sector (4,816 tonnes).

Table 2-3: Tonnes by Sector (2016)

Sector	Percent of Total Disposed Materials	Quantity of Disposed Materials (tonnes)
Single-Family	19%	5,719
Multi-Family	8%	2,408
Industrial, Commercial, and Institutional	41%	12,341
Drop-off	16%	4,816
Construction and Demolition	16%	4,816
Total Disposal Rate	100%	30,100

The CVRD has one of the lowest disposal rates in the province and is well below the average provincial disposal rate of 498 kg per capita. Figure 2-5 presents the 2015 disposal rates in all Regional Districts (RDs) in BC, as well as the average provincial disposal rate. ³RDs highlighted in green represent neighbouring RDs with similarities to CVRD. In 2016, the CVRD disposal rate increased to 359 kg per capita.

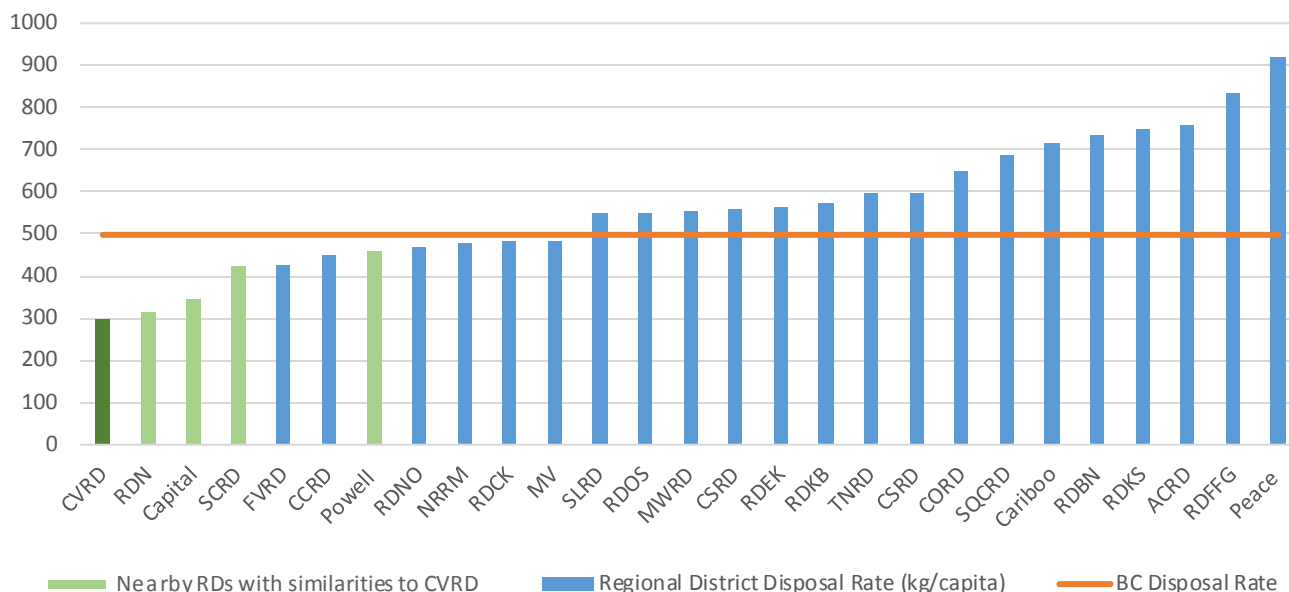


Figure 2-5: 2015¹ Disposal Rate by Regional District

Notes: ¹ 2015 data is the most recent disposal data available for all RDs from the Ministry.

³ The most recent disposal rates available from the Ministry were measured in 2015.

2.4.1.1 Waste Leakage

It is difficult to quantify the amount of waste that bypasses the CVRD system; that is, MF, ICI, or C&D waste that is shipped directly to out-of-region transfer stations or landfills. Loss of waste to private transfer stations that ship to out-of-region landfills is influenced by operational efficiencies and economic factors including the CVRD waste tipping fee and the US exchange rate. Figure 2-6 presents the total waste disposed through the CVRD's waste management system from 2012 to 2017. Reductions between 2013 and 2015, and again in 2017, correspond with a decline in visits by some major commercial haulers.

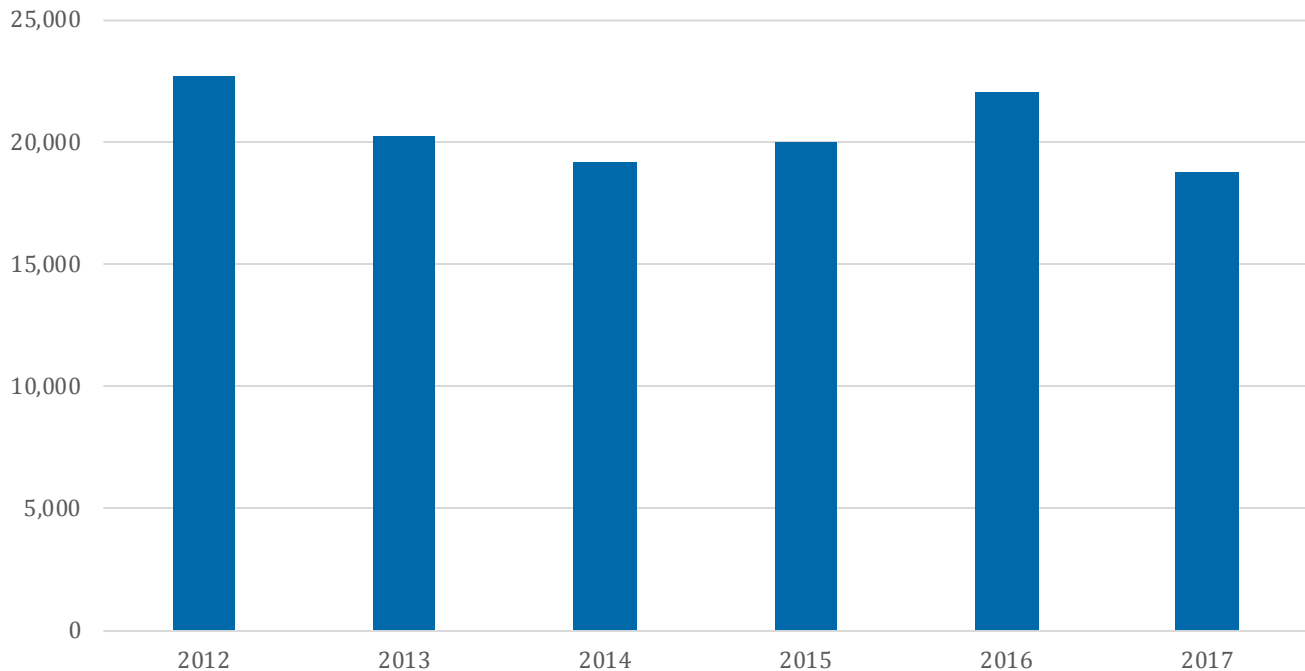


Figure 2-6: Public Waste Management System Tonnages, 2012 - 2017

2.4.1.2 Carbon Neutral Operations

The CVRD is a signatory with Climate Action Charter and has been committed to carbon neutral operations since 2012. The carbon offset credits, which CVRD has obtained voluntarily, are presented in Table 2-4. Most of these offset credits have been generated from yard and garden waste diversion programs.

Table 2-4: Carbon Offset Credits

Year	Voluntary Carbon Offsets (tonnes CO ₂ equivalent)
2012	610
2013	449
2014	1,792
2015	1,606
2016	1,391

2.4.2 Waste Composition

In 2017, the CVRD conducted a waste composition study to determine what types of recoverable materials were still in the waste stream. The composition was calculated for each sector, and the overall average for the CVRD was calculated.

Figure 2-7 presents the overall waste composition for the CVRD. The largest component of the waste disposed was compostable organics (24.4%), followed by plastics (17.2%), and paper (11.1%).

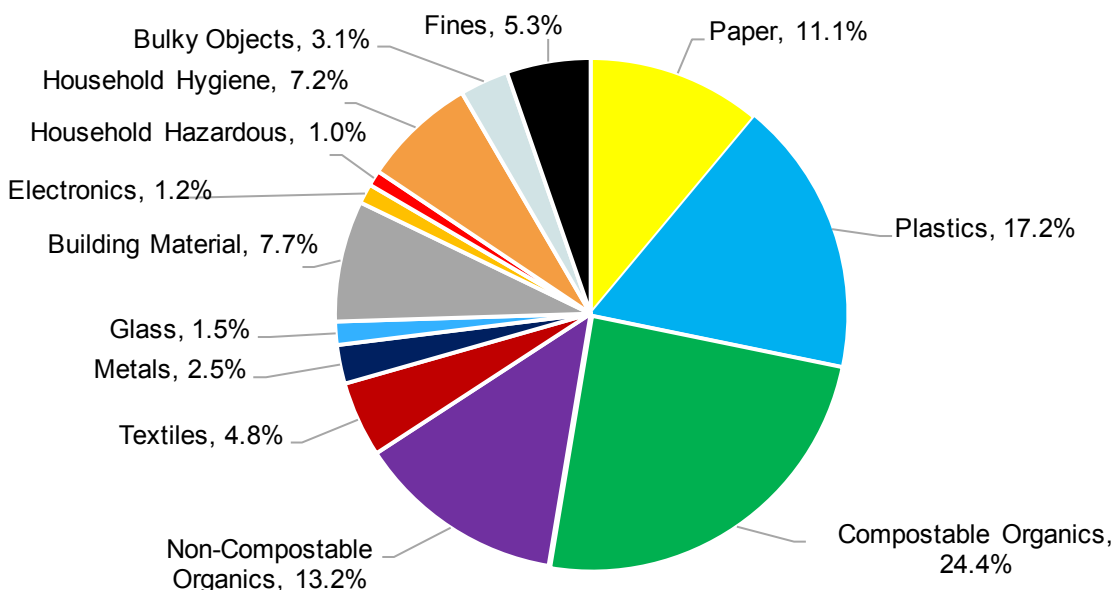


Figure 2-7: Overall Waste Composition – All Sectors

Figure 2-8 presents the waste composition by sector. This figure presents the primary waste composition categories. Most of the paper, plastic, metal, and organic materials are easily recyclable. This illustrates that there are still many recoverable materials in the waste stream.

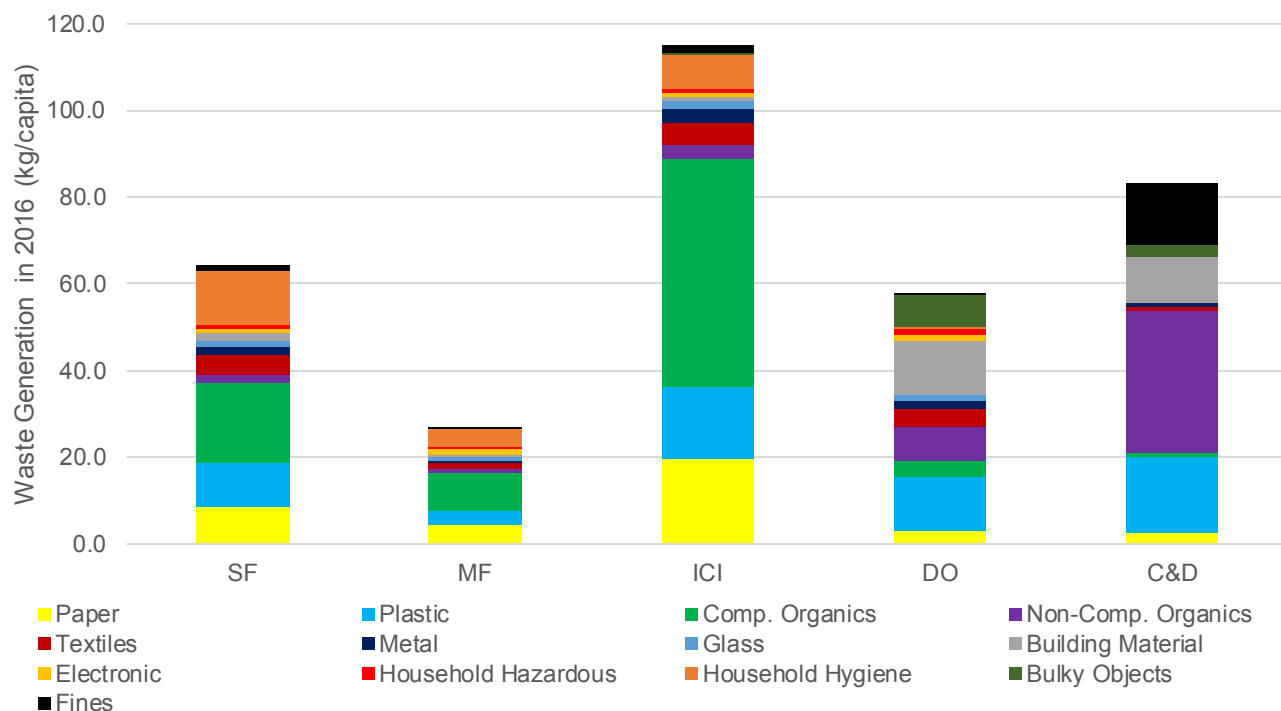


Figure 2-8: Waste Composition and Disposal by Sector

Details of the waste composition study are presented in Appendix E. Results for each sector will be noted as relevant throughout this report.

2.5 Facility and Services Summary

This section describes the facilities and services in the region and discusses the flow of waste throughout and around the CVRD. A map of all facilities in the CVRD is presented in Appendix D.

Figure 2-5 represents the major waste management facilities in the CVRD and indicates their type, location, and their ownership model. These facilities, as well as smaller recycling facilities in the CVRD, will be discussed in more detail in this section. All waste management facilities in the CVRD are shown in Map 4 in Appendix D.

Table 2-5: Overview of Major CVRD Facilities

Facility Name	Facility Type	Location(s)	Ownership Model
Bings Creek Recycling Centre & Garbage Drop-Off Depot	Transfer Station and Drop-off Depot	Duncan	Public
Meade Creek Recycling Centre & Garbage Drop-Off Depot	Drop-off Depot	Lake Cowichan	Public
Peerless Road Recycling Centre & Garbage Drop-Off Depot	Drop-off Depot	Ladysmith	Public
Coast Environmental	Transfer Station, Drop-off Depot, Organics Processor	Duncan and Chemainus	Private
Fisher Road Recycling	Transfer Station and Drop-off Depot, Organics Processor	Cobble Hill	Private

2.5.1 Summary of Waste Flow

It is important to understand waste flows to understand the impacts of any proposed changes to the solid waste management system. Figure 2-9 summarizes typical waste flow. A detailed diagram presenting waste flow within the CVRD is presented in Appendix F.



Figure 2-9: Typical Solid Waste Management Flow Diagram

Waste flow in the CVRD can be summarized as follows:

- Most SF residential waste is hauled to Bings Creek (except curbside waste collected through subscription services in Electoral Areas A, B, and C, which is hauled to Fisher Road Recycling, and Area H garbage which is hauled to the Peerless Road Recycling Centre);
- MF garbage is hauled to the Bings Creek Transfer Station or a private transfer station;
- ICI garbage may be hauled to a private transfer station, Bings Creek Transfer Station, or directly to an out-of-region landfill; and
- C&D material may be hauled to a private transfer station within the CVRD or it may be hauled directly to a landfill outside of the CVRD.

2.5.2 Collection Operations

Three types of waste collection exist in the CVRD:

- Public collection, or publicly contracted collection;
- Private collection; and
- Self-haul by residents or small businesses to drop-off depots.

2.5.2.1 Residential Curbside Waste Collection

Residential waste includes waste from single family and multi-family residences. In this report, single-family residences refers to all single family homes and multi-family buildings with four or less units. Multi-family residences refer to all multi-family buildings with five or more units.

Table 2-6 summarizes the curbside collection service levels for garbage, recycling, and organics in the CVRD. Cells highlighted in red indicate that there is no collection available; cells highlighted in orange indicate that service is available from a private hauler but not mandatory for residents to participate. Map 3 in Appendix D illustrates the geographical boundaries of curbside collection services delivered by municipalities and the CVRD.

Table 2-6: Curbside Collection Levels

Jurisdiction	Single Family						Other Collection
	Garbage		Organics		Recycling		
	Collection Frequency	Collector	Collection Frequency	Collector	Collection Frequency	Collector	Description
City of Duncan	Every-other-week	City of Duncan	Weekly	City of Duncan	Every-other-week	City of Duncan	Weekly glass and yard waste collection for single family residences.
District of North Cowichan	Every-other-week	District of North Cowichan	Weekly	District of North Cowichan	Every-other-week	Contractor	None
Town of Lake Cowichan	Every-other-week	Town of Lake Cowichan	Weekly	Town of Lake Cowichan	Every-other-week	Contractor	Garbage, recycling, and organics collection offered to all multi-family buildings and commercial businesses.
Town of Ladysmith	Every-other-week	Town of Ladysmith	Weekly	Contractor	Every-other-week	Contractor	None
Electoral Areas A, B, C, some parts of Area D	Subscription (varies)	Private Collector	Subscription (varies)	Private Collector	Every-other-week	CVRD	None
Electoral Areas D, E, F ¹ , G, H and I ¹	Every-other-week	CVRD	None	N/A	Every-other-week	CVRD	None

¹ Areas F and I receive weekly service June 15 to October 15

Single Family Garbage

All municipalities provide every-other-week curbside garbage collection to their residents.

There are varied service levels of curbside garbage collection in the Electoral Areas. Approximately 5,300 households receive curbside garbage collection from the CVRD. The CVRD provides every-other-week garbage collection in Areas D, E, and G. Areas F and I receive weekly garbage collection during the summer months from the CVRD (to reduce wildlife conflicts), and bi-weekly service for the remainder of the year. Participation rates (i.e. the number of homes that set out containers for collection) are approximately 74%, and per-home collection quantities average approximately 12 kg per collection. Areas A, B, C, and H have no mandatory garbage collection service, but residents in these areas can access a private hauler and subscribe to a garbage collection service.

First Nation councils in Cowichan, Penelakut, Ditidaht, Stz'uminus and Halalt First Nation communities, provide curbside garbage collection to members.

Single Family Recycling

Participation in curbside recycling is mandatory in the CVRD and curbside recycling collection is provided throughout the region to all SF residences.

Municipalities provide curbside recycling collection services to their residents.

The CVRD provides curbside recycling services to all Electoral Areas (approximately 12,600 homes). Participation rates in the CVRD's curbside recycling program range from an average of 58% in the winter to 66% in the summer.

All member municipalities within the region are registered as collectors with RecycleBC, the provincial EPR steward for paper and printed packaging⁴. Cowichan Tribes is the only First Nation within the region registered as a collector offering residential PPP collection at curbside. The Stz'uminus First Nation website states that curbside recycling collection is offered to members.

Single Family Organics

Within municipalities, participation in curbside organics programs is mandatory and weekly collection services are offered.

Participation in curbside organics collection programs is not mandatory in Electoral Areas and curbside organics service is not consistently available. Currently, there is no organics collection service available in Electoral Areas E, F G, H or I. Residents in Electoral Areas A, B, C, and some parts of Area D, can access organics collection on a subscription basis from a private hauler.

Backyard composting, in addition to participation in curbside organics collection programs, is encouraged to support organics diversion.

2.5.2.2 Multi-Family Collection

In general, in the CVRD (except in Lake Cowichan), MF buildings with more than four units are not serviced under public sector collection programs and must instead rely on the private sector for service. Service varies widely

⁴ EPR is a provincial policy tool that is intended to create an incentive for producers to include environmental considerations in design of products. In 2014, a new EPR program for packaging and printed paper (PPP) was introduced in BC, resulting in financial changes to curbside recycling collection programs, as RecycleBC (formerly Multi-Material BC) assumed responsibility for management of PPP collection and processing.

between buildings. Some are underserved with no mixed recycling collection, no access to the provincially mandated EPR program for PPP, and no organics collection.

2.5.2.3 Industrial, Commercial, and Institutional Collection

Except in Lake Cowichan, the ICI sector within the CVRD is serviced by the private sector for garbage and recycling. Services vary widely, from three-stream collection (garbage, recycling, and organics) to garbage only. Small-volume commercial generators may choose to self-haul garbage and recyclable materials to depots. Public and private depots can accommodate small quantities of commercial material for most recycling programs. Public depots also offer separate collection for small quantities of plastic and film plastic packaging from commercial generators.

Lake Cowichan's municipal curbside collection program for garbage, recycling and organics is offered to all businesses within the Town's boundaries. Service is not mandatory and businesses have the option to obtain private service instead.

2.5.2.4 Depot Collection

Materials not collected by curbside programs are typically delivered to recycling drop-off depots. Several types of residents may use these depots:

- Residents who do not receive curbside garbage collection (may include residents in Electoral Areas A, B, C and H);
- Residents who occasionally produce more garbage than they can dispose of at curbside; and
- Residents who wish to recycle materials that are not accepted in their curbside recycling program.

Public Depots

The CVRD operates a network of public recycling and garbage drop-off depots (Recycling Centres) that service communities in the central, north and western parts of the region:

- Bings Creek Recycling Centre & Garbage Drop-Off Depot (Bings Creek) in Duncan;
- Peerless Road Recycling Centre & Garbage Drop-Off Depot (Peerless Road) in Ladysmith; and
- Meade Creek Recycling Centre & Garbage Drop-Off Depot (Meade Creek) in Lake Cowichan.

The Recycling Centres at these facilities provide extensive recycling opportunities for residential customers, with more than 650 individual products accepted, many at no charge. All CVRD Recycling Centres also accept self-hauled garbage for disposal. Fisher Road Recycling and Coast Environmental (both Chemainus and Duncan locations) also accept self-hauled residential garbage. The locations at which all recyclable materials in the CVRD are accepted are presented in Appendix C.

Private Depots

The CVRD licenses private garbage and recycling facilities under Bylaw No. 2570. The CVRD is one of three RDs in the Province that license private facilities.

There are currently seven private facilities licenced by the CVRD to accept municipal solid waste (MSW) and recyclable materials (including organics), within the region.

The southern Electoral Areas (A, B, and C) are served exclusively by private facilities. The CVRD tried to site a depot in Area B in 2011 but was unsuccessful. In lieu of public service, the CVRD partners with private sector depots to offer free drop-off for packaging and printed paper and yard waste for south end residents.

2.5.3 Transfer Stations

There is one large public transfer station in the region: the CVRD-owned and -operated Bings Creek Recycling Centre & Garbage Drop-Off Depot. It is a centralized public transfer station for materials collected throughout the region hauled by municipalities, the CVRD, and materials collected from CVRD Recycling Centres (as described in 2.5.1). Public and private haulers deliver waste in self-tipping vehicles to Bings Creek, where it is loaded into rail containers for shipment to an out-of-region landfill, via truck, barge and rail.

Two private licensed transfer facilities exist in the CVRD. Fisher Road Recycling receives privately-hauled garbage, recyclables, and organics, including materials collected in subscription-based curbside collection programs from Electoral Areas A, B and C. Coast Environmental (with locations in Duncan and Chemainus) is a transfer facility for commercial and residential garbage and C&D materials. Both Fisher Road and the Chemainus location of Coast Environmental have on-site composting facilities. These licenced facilities are required to annually report the quantity of garbage and other materials disposed and diverted.

Recycling

Large quantities of residential recycling are collected for transfer at Bings Creek, but there are no in-region transfer or processing options for large volumes of ICI recyclables (e.g. mixed paper, cardboard, tin, plastics etc.). These materials are not accepted at Bings Creek because existing infrastructure is dedicated to the PPP EPR program, which is for residential materials only. Instead, single-stream ICI materials are hauled directly to materials recovery facilities (MRF) in either Nanaimo or Victoria.

Organics

Organic food waste from residential and ICI sources is accepted at the Bings Creek Transfer Station, where it is consolidated with residential food waste from municipalities and shipped to a private facility for processing. ICI food waste can also be hauled directly to any private licenced composting facility.

Residential and commercial yard waste is accepted at Central Landscape in Cobble Hill, a private composting facility contracted by the CVRD to accept and compost yard waste. ICI yard waste can also be delivered directly to Fisher Road Recycling or Coast Environmental.

2.5.4 Processing

All processors of organics and recyclable materials in the CVRD are summarized in Table 2-7. For recyclable materials, processors are facilities that sort and sell (or use) recycled materials. Organics processors are facilities that recover nutrients from waste organic materials through composting or another process (for example, anaerobic digestion).

Table 2-7: Processors of Recyclable and Organic Materials in the CVRD

Facility	Location	Recyclable Materials Processed	Organic Materials Processed
Fisher Road Recycling	Cobble Hill	Mattresses, couches and armchairs, clean wood waste, drywall, asphalt roofing shingles, metal, rubble, packaging and printed paper (PPP)	Food and yard waste
Coast Environmental	Chemainus and Duncan	Clean wood waste, cardboard, drywall, asphalt roofing shingles, rubble, metal	Food and yard waste
Stone Pacific Contracting	Duncan	Rubble	None
Central Landscape Supplies	Cobble Hill	None	Yard waste
Cowichan Biodiesel Coop	Duncan	None	Waste vegetable oil
Hillside Stone & Garden	Duncan	None	Yard waste
Schnitzer Steel	North Oyster	Metals	None

As noted above, there are no processors for comingled recyclables in the CVRD; these materials are transported to a MRF in either Nanaimo or Victoria.

2.5.5 Landfills

There are no landfills in the CVRD. Waste destined for disposal is exported to an out-of-region landfill, currently the Roosevelt Regional Landfill in Washington State, USA. In 2016, the CVRD shipped approximately 22,000 tonnes of waste to this landfill. Some of the private sector transfer stations also ship waste to the Roosevelt Regional Landfill.

The CVRD maintains a contingency disposal agreement with the Regional District of Nanaimo (RDN), in the event export to the Roosevelt Landfill is temporarily disrupted. Invasive plants collected at CVRD Recycling Centres are also transferred to the RDN landfill for disposal.

3.0 CURRENT SOLID WASTE SYSTEM

Figure 3-1 outlines the key components of CVRD's solid waste management system, including waste prevention, waste generation, collection, recycling and disposal. This section of the report describes the associated services, programs, infrastructure and policies that are associated with these system components.

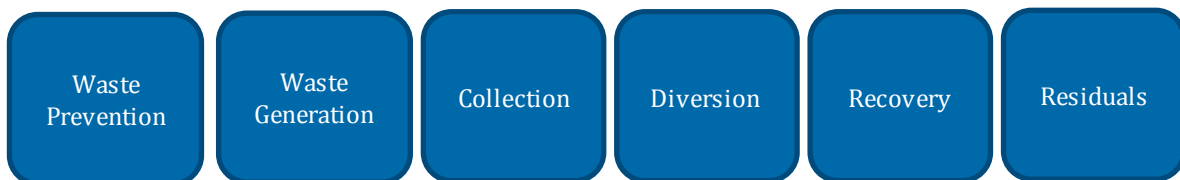


Figure 3-1: Components of the Waste Management System

3.1 Waste Prevention

Waste prevention includes initiatives to improve waste management that fall into the top 2 Rs of the pollution prevention hierarchy: reduction and reuse. These initiatives are an essential component of the CVRD waste management system. Additionally, this section includes initiatives which are intended to educate the public about the entire waste prevention hierarchy.

3.1.1 Waste Reduction

Cowichan Recyclopedia

In 2013, the CVRD Environmental Guide and Recycling Directory was moved to an online platform and rebranded as the Cowichan Recyclopedia, an interactive online recycling database that provides waste reduction, reuse and recycling tips for hundreds of household items. An interactive mapping feature was added to the Recyclopedia in 2016. The site received 1,085-page views from January 1, 2017 to November 29, 2017. The site is a good platform to promote waste reduction and reuse but would benefit from increased promotion.

Publication of *Earth Issues, Our Lifestyles and the Environment*

In 2005, the CVRD developed *Earth Issues, Our Lifestyles and the Environment*, an environmental education manual targeting grades K to 5. The manual is available on the CVRD website. The school education program has grown significantly and now offers in-classroom presentations region-wide for grades K to 12. The CVRD has partnered with a local non-profit environmental organization to develop and provide classroom education sessions that align with school curriculum guidelines. The program also includes a public outreach component, which includes booths at public markets, festivals and events to provide information on waste reduction, reuse and recycling programs to residents.

Encouraging Reduction in Plastic Bag Use

In 2009, an outreach program was implemented to encourage all grocery stores in the region to reduce the use of single-use plastic bags. Most grocery stores now charge a fee for single-use plastic bags and provide alternatives to single-use plastic bags at checkout.

Garbage Can Limits

Waste reduction is promoted through the use of garbage can limits in all curbside collection programs throughout the CVRD.

Food Waste Reduction

A key waste reduction opportunity within the ICI sector is the recovery of expired, but usable, food waste at grocery stores. It is estimated that 10% of ICI sector waste (over 600 tonnes per year) is donatable food. The Cowichan Green Community, a local non-profit environmental organization, has founded a Food Security Coalition to explore opportunities to reduce food waste within the region.

3.1.2 Reuse

Free Stores

Free stores were introduced in 2006 at CVRD Recycling Centres. Free stores allow residents to divert reusable materials from the waste stream by paying to drop off materials (tipping fees are set at the same rate as garbage tip fees), but picking up items is free. Requiring payment for drop-off covers the cost of managing materials and

ensures that Free Stores do not compete with local thrift stores. The program has been expanded and Free Stores will be in place at all CVRD Recycling Centres by spring 2018.

Online Sales Platforms

Online sales platforms such as Used Cowichan and Kijiji offer additional local reuse opportunities for household goods, furniture and building materials. There are also several stores operating in the region that exclusively sell repurposed or refurbished furniture, which suggests a strong local resale economy. At this time, other platforms to encourage reuse, such as Repair Cafes, tool libraries, or reclamation of building supplies, have not been established in the region, but there may be opportunities for growth in this area in the future.

ICI Sector Reuse Opportunities

Reuse opportunities within the ICI sector are currently limited. Some opportunities to improve reuse within the ICI sector may include mandatory source-separation for C&D debris. C&D reuse and diversion programs will require coordination with Provincial and local building codes and local Planning departments.

3.2 Diversion

The CVRD has several public and private facilities that collect and process recyclable and organic waste for diversion.

3.2.1 Recycling

There are a range of recycling services available to CVRD residents, although the availability of services varies across the region.

EPR regulation requires producers of the designated products to develop a program for their end-of-life collection and recovery of materials and to consult stakeholders (including local governments) when developing their plans.

3.2.1.1 Residential Recycling

The 2017 waste composition study found that there is a considerable amount of recyclable materials in residential garbage: in SF residential garbage, the largest component was compostable organics (29.0%), followed by household hygiene (19.4%), plastics (15.6%), and paper (13.2%). In MF garbage, the largest component was compostable organics (32.9%), followed by paper (17.1%), household hygiene (14.9%), and plastics (11.0%).

As discussed in Section 2.5.2.1, all SF residences in the CVRD receive curbside recycling collection. Additionally, in Lake Cowichan, MF buildings receive recycling collection service. Outside of Lake Cowichan, consistent collection of recyclables from MF buildings is lacking. The 2017 waste composition study found that a large proportion of the materials in MF garbage is recyclable: paper comprises 17.1% of the waste stream and plastics comprise 11.0% of the waste stream.

The CVRD Recycling Centres (Bings Creek, Peerless Road, and Meade Creek) are managed by the CVRD and have been designed to maximize convenience by providing 'one-stop-drop' services. The Recycling Centres at these facilities provide extensive recycling opportunities for residential customers, with more than 650 individual products accepted (including organic materials). The CVRD does not do any in-house processing, instead partnering with the private sector as well as with EPR programs to recycle these materials. Tipping fees, accepted materials, and regulations at these facilities are defined by CVRD Bylaw No. 2108. Most CVRD residents can access one of these depots within 15 minutes driving time, however, there is no public depot in the south end of

the region. Residents of Electoral Areas A, B and C must use private facilities (which may not offer the same range of drop-off services) or drive for up to 30 minutes to access a public facility.

CVRD residents have benefitted from the recent expansion of EPR programs, including the 2014 launch of the PPP EPR program. The introduction of this program has resulted in several local retailers offering drop-off recycling programs. There are several return-to-retail locations for residential EPR products such as plastic film (e.g. grocery bags), styrofoam and refundable beverage containers. Most large grocery stores within the region offer return programs for these items. The local London Drugs also offers an extensive take-back program for almost all packaging purchased from the store.

3.2.1.2 ICI Recycling

The 2017 regional waste composition study shows that there is room for significant improvement in diversion programs for the ICI sector. It is estimated that ICI waste makes up the largest portion of the regional waste stream at 41%⁵. Of this, 16.9% is paper, and 14.7% is plastics.

Outside of Lake Cowichan, there are no municipal collection programs servicing the ICI sector. Collection and hauling services provided by the private sector tend to vary widely, from three-stream collection (organics, waste, recycling) to garbage-only. As discussed in Section 2.5.2, there are no in-region transfer or processing options for large volume ICI generators of single-stream mixed recycling (e.g. mixed paper, cardboard, tin, plastics etc.).

At this time, the only regulatory mechanism to implement source-separated collection programs in the ICI sector is landfill bans. A review of CVRD Bylaw No. 2018 is needed to ensure disposal bans continue to reflect diversion goals.

3.2.1.3 C&D Recycling

C&D waste from construction, demolition and renovation projects (C&D waste) consists primarily of wood and, to a lesser extent, roofing materials, drywall, plastic, cardboard, metal, concrete and other building materials. There are three facilities in the CVRD that recycle C&D waste: Coast Environmental with locations in Chemainus and Duncan, Fisher Road Recycling in Cobble Hill, and Stone Pacific Contracting in Duncan.

During the 2017 waste composition study, the contents of post-processing C&D materials were analyzed. This material is what remains after recyclable materials have been removed by the processing facility. The largest component of the garbage was non-compostable organics (e.g. treated wood) (39.5%), plastics (20.9%), and building materials (12.8%). Non-compostable organics largely consisted of contaminated wood (37.3%) with some rubber (2.2%). Plastics mostly comprised durable plastic products (20.0%). All of the types of materials above currently tend to be difficult or not economically viable to recycle. These materials may be suitable to be used as a process engineered fuel.

3.2.1.4 Hazardous Waste Recycling

The CVRD partners with Provincial EPR programs for collection and recycling of several household hazardous materials including flammable liquids, solvents, oil, gasoline, polychlorinated biphenyl (PCB) ballasts, and mercury-containing thermostats. All household hazardous materials accepted under EPR programs can be dropped off for free at all CVRD Recycling Centres. Large volumes of material covered under EPR programs can often be managed by contacting stewardship agencies directly. Large volumes of non-EPR material can be shipped directly to out-of-region processors. Asbestos-containing materials are not accepted at CVRD Recycling Centres but can be taken

⁵Association of Vancouver Island Coastal Communities (AVICC) Solid Waste Technical Group – Solid Waste Research Data Update, 2017

to Coast Environmental (Duncan location), or directly to the RDN's Cedar Road landfill, under a service agreement with the CVRD.

Overall, the 2017 waste composition found that the waste in the region was 1.0% hazardous waste. This material came mostly from the single-family, multi-family, and drop-off waste.

3.2.1.5 In-Region Processing

There are a variety of processors of recyclable materials in the region. The region is able to offer recycling programs for many non-EPR materials due to a strong local recycling industry. This industry has developed due to a combination of factors, including historically high garbage disposal costs (due to shipping rates), proximity to major population centres, good transportation infrastructure, availability of land, and political support for waste diversion. Publicly funded recycling programs and landfill bans have generated a steady supply of feedstock, which, in turn, supports investment in processing facilities.

The in-region processing of recyclable materials is presented in Table 3-1.

Table 3-1: In-Region Processing of Recyclable Materials

Material	In-Region Processing Location	Notes
Mixed Recycling	None (shipped out of CVRD)	In 2006, curbside recyclables were delivered to the Vancouver Island Recycling Centre located on Koksilah Road near Duncan BC. The site was purchased by BFI Inc (now Waste Connections of Canada), and has subsequently closed.
Mattresses, Couches, and Armchairs	Fisher Road Recycling ¹	Collected items are manually disassembled into component parts for recycling. Materials recovered include metals, wood and foam.
Hazardous Waste	None (shipped out of CVRD)	-
Construction and Demolition Materials		
Clean wood waste	Coast Environmental and Fisher Road Recycling	There are no regulatory requirements for source-separating C&D waste; private facilities voluntarily sort the mixed loads to retrieve high quality material for recycling.
Drywall	Coast Environmental and Fisher Road Recycling	
Asphalt Roofing Shingles	Coast Environmental and Fisher Road Recycling	
Rubble	Stone Pacific	

¹Fisher Road Recycling is contracted by the CVRD to recycle all mattresses, couches, and upholstery armchairs collected at Bings Creek. More than 12,000 mattresses have been collected since the program's implementation in 2012.

3.2.2 Organics

Organic waste generally refers to yard and garden waste (i.e., leaves, branches, weeds, and grass), food waste, and some non-recyclable paper products such as paper toweling and tissue. There are opportunities to reduce the amount of organic waste, as illustrated in Figure 3-2. This figure is a hierarchy of food waste management solutions that replicates the pollution prevention hierarchy of reduce then reuse then recycle, before considering disposal.

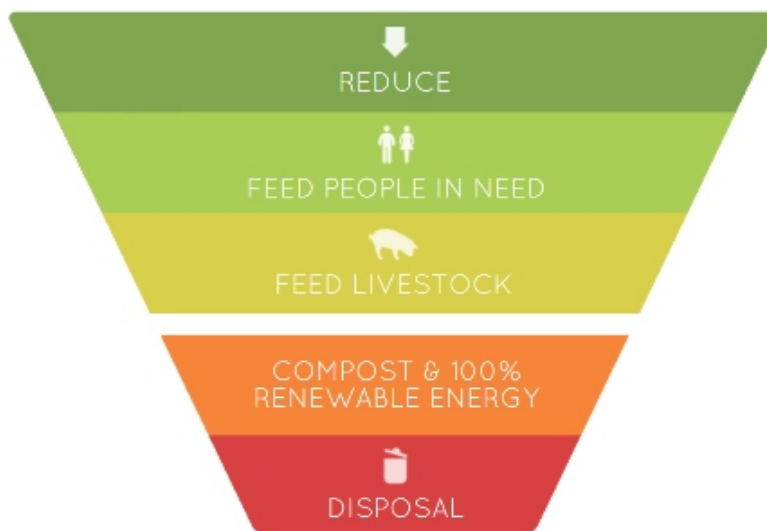


Figure 3-2: Food Waste Management Hierarchy

3.2.2.1 Residential Organics Recycling

Within municipalities, participation in curbside organics programs is mandatory and weekly collection services are offered. In Electoral Areas A, B, C, and some parts of Area D, organics collection is available but program participation is not mandatory.

Outside of Lake Cowichan, there is no curbside collection of organics for MF buildings. The 2017 waste composition study found that 32.9% of the materials in MF garbage are compostable organics.

Municipal residential collection programs are intended to collect food waste and limited quantities of yard waste. Much of the CVRD is rural and many properties produce more yard waste than can be collected by municipal crews. Thus, open burning of yard waste has been problematic in the CVRD, which leads to reduced air quality⁶. The air contaminant of greatest concern is PM_{2.5}, and estimates suggest that up to 53% of total PM_{2.5} produced in the region is from open burning⁷.

Residential open burning is banned in all member municipalities except North Cowichan, where open burning is banned within urban containment boundaries but permitted, with restrictions, in other areas. Residential open burning is permitted, with restrictions, in Electoral Areas A, B, C, D, E and G under CVRD Bylaw No. 3716 – *Smoke Control Regulation Bylaw, 2013*, which was developed to regulate the residential open burning of yard waste, and prevent backyard burning of garbage. The bylaw bans burning of garbage and wet, compostable materials (such as grass), and limits the burning of clean, dry material to a one-month period during the spring and fall. There are no restrictions on residential open burning in Electoral Areas F, H and I. Working farms and forest lands are exempt from local burning regulations.

In 2006, the CVRD introduced a pilot program for free drop-off of yard and garden waste at Bings Creek. The program was expanded to all CVRD Recycling Centres in 2007 and today is one of the region's most popular

⁶ The region has one of the highest hospital admission rate for children with respiratory diseases in the Province, averaging 70% higher than the provincial average from 1998 to 2012.

⁷ "The Air Quality Problem." *The Air Quality Problem* | Cowichan Valley Regional District. Cowichan Valley Regional District. 4 December 2017. <https://www.cvr.bc.ca/2186/The-Air-Quality-Problem>.

recycling programs with 7,333 tonnes of yard waste collected and composted in 2016. The program is an important component of the region's air quality improvement strategy.

3.2.2.2 ICI Organics Recycling

The 2017 waste composition study found that 45.6% of ICI sector waste is compostable organics.

Organics collection is inconsistent for the ICI sector in the CVRD. A phone survey completed by CVRD staff in 2015 showed that several large grocers and retailers within the region do not have programs in place for mixed recyclables or organics diversion. Amongst institutional generators such as local governments, Island Health facilities including the Cowichan District Hospital, and school districts, diversion programs for recyclable materials are common, however organics diversion is inconsistent. For example, local school districts do not have district-wide organics diversion programs in place, although several classrooms have implemented organics collection and back-yard composting on an individual-basis. The CVRD maintains recycling and food waste diversion programs at all CVRD-owned facilities.

ICI organics can be hauled to Bings Creek, Fisher Road Recycling, or Coast Environmental (Chemainus).

3.2.2.3 In-Region Processing

There are three private composting facilities within the region, all licenced under CVRD Bylaw No. 2570: Coast Environmental (Chemainus), Fisher Road Recycling, and Central Landscape. Since the summer of 2016, the Provincial government has required all composting facilities that produce more than 5,000 tonnes of finished compost per year to obtain a permit under the *Organic Matter Recycling Regulation*. Fisher Road Recycling and Coast Environmental are subject to the new permitting requirements.

Table 3-2: Organics Processing Facilities

Facility	Materials Accepted	Process	Annual Capacity (Tonnes)	Sectors Accepted	Notes
Coast Environmental	Yard waste, food waste, and "sludge" (comprised of brewery, wine, dairy, and septic pre-treated and stabilized waste)	In-vessel facility, using Gore Cover technology and aerated indoor floors	13,200	Residential and ICI	The CVRD currently has a contract with Coast Environmental to process all organic material received at the Bings Creek transfer station.
Fisher Road Recycling	Yard waste and food waste	In-vessel facility with aerated floors	18,000	Residential and ICI	Fisher Road currently receives the majority of incoming feedstock from out-of-region sources, however an application to increase capacity to 36,000 tonnes is currently under review by the CVRD. If approved, this would significantly increase available capacity.

Facility	Materials Accepted	Process	Annual Capacity (Tonnes)	Sectors Accepted	Notes
Central Landscape	Yard waste	Passive outdoor windrows	6,000	Residential and ICI	The CVRD currently has a contract with Central Landscape to process yard waste received under the CVRD's free yard waste drop-off program for south-end residential and small-volume commercial generators. A Request for Proposals has recently been issued that, when awarded, may result in a change to the processor and may also result in the consolidation of residential food and yard waste processing. Food and yard waste collected under private subscription services would be excluded. Proposals are currently under review and a contract is expected to be awarded in 2018.
Total			37,200		

The Town of Ladysmith has recently completed construction of an enclosed aerated composting facility designed to process the Town's municipal biosolids. The facility has been designed with additional capacity, so there is potential, in future, for it to provide an additional processing option for organic materials.

Regional Organics Processing Capacity

Regional composting capacity has grown significantly since the last SWMP Amendment in 2006. However, composting programs have also grown, meaning that the capacity to accommodate new organics collection programs is limited. At the time of writing, regional capacity for processing of food waste has been reached. Further initiatives to increase the amount of food waste collected, (for example, expansion of mandatory source separation programs for organics for ICI and MF sectors) could cause the total amount of organics collected to exceed the regional processing capacity. Though SF waste represents less than 20% of the total waste in the CVRD, 85% of organics currently dropped off at Bings Creek is from curbside programs. Thus, the amount of organics capture from other sectors (i.e. MF, ICI) is low.

Facilities that process more organics than they were designed to receive are susceptible to odour incidents. Odour complaints have been an issue in recent years. Nearby RDs such as Metro Vancouver, Capital Regional District (CRD), and RDN are struggling with odour issues from composting facilities within their region. Odour complaints are a serious issue that shut down organics processing facilities.

More than 7,000 tonnes of yard waste is collected annually through the free yard waste drop-off program. This is less than one quarter of the regional yard waste processing capacity. Changes to programs with regards to yard waste collection would not be likely to exceed the regional yard waste processing capacity.

3.3 Recovery – Waste to Energy

Two processes occur in the CVRD to recover energy from waste. A methane capture system at the Roosevelt Landfill in Washington provides some energy recovery from landfilled waste. Locally, energy is derived from source-separated clean wood waste, wood waste separated from mixed C&D debris, and some landclearing debris (i.e. stumps), which is processed into hog fuel by Coast Environmental, and used to fire boilers at pulp mills on Vancouver Island.

A joint-study in 2008 between the CVRD and the RDN reviewed the feasibility of establishing a waste to energy (WTE) facility to process residual waste streams from both regional districts. The study found that, while viable technology existed, recovery of energy from residual waste would not be economically feasible for the CVRD's waste stream alone. A study was completed again in 2011 by AECOM which builds on the findings of the 2008 study and includes residual waste from the CRD⁸. The results of the 2011 also indicated that a WTE facility would not be economically feasible.

3.4 Residuals Management

The CVRD does not have a disposal facility and instead exports waste out-of-region, currently to the Roosevelt Regional Landfill in Washington State, USA. In 2016, the CVRD shipped 22,108 tonnes of waste to the Roosevelt Landfill. It is estimated that a further 7,441 tonnes was shipped to out-of-region landfills by private transfer stations, bringing the 2016 regional waste total to 29,105 tonnes.

Until the late 1990s, the region relied on three MSW incinerators and one municipal landfill site for waste disposal. An extensive search for a new landfill site was carried out beginning in the mid-1990s, during which time construction was also started on the new Bings Creek Transfer Station. During Bings Creek construction, the CVRD shipped 7,627 tonnes of MSW to the Cache Creek Landfill in the Thompson-Nicole Regional District. Initially done as a temporary measure, waste export became a long-term solution when the former CVRD landfill closed in 1998, and the CVRD was unable to obtain final approval for the proposed new landfill site. Export of solid waste has remained the region's primary disposal solution in subsequent SWMPs; the exploration and analysis of alternative disposal solutions is an ongoing process. The CVRD maintains a contingency disposal agreement with the RDN, in the event that export to the designated disposal facility is temporarily disrupted.

3.4.1 Historic Disposal Sites

Prior to the development of the Bings Creek Transfer Station in the late 1990s, the region relied on three MSW incinerators and one municipal landfill site for waste disposal, as noted above. These sites are presented in Table 3-3.

Table 3-3: Historic Disposal Sites Activities

Facility	Location	Years of Operation	Operator	Current Activity
Koksilah Road Sanitary Landfill	Near Duncan, on Cowichan Tribes Reserve Land	1959 – 1973 (Unpermitted) 1973 – 1998 (Permitted)	City of Duncan	<ul style="list-style-type: none"> Tri-annual ground- and surface-water monitoring at the site Regular cover inspections and site maintenance (as per the permit abandonment requirements outlined by the Ministry)
Koksilah Road Incinerator	Near Duncan, on Cowichan Tribes Reserve Land	1981 – 1995	CVRD	<ul style="list-style-type: none"> Cowichan Tribes and the CVRD are currently engaged in mediation to explore alternate disposal options for remaining incinerator ash
Peerless Road Incinerator	South of Ladysmith	1979 – 1998	CVRD	<ul style="list-style-type: none"> Buildings have been converted to use as a municipal waste and recycling drop-off depot
Meade Creek Incinerator	West of Lake Cowichan	1976 – 1998	CVRD	<ul style="list-style-type: none"> Buildings have been converted to use as a municipal waste and recycling drop-off depot

⁸ AECOM. Tri-Regional District Solid Waste Study. 2011.

Between nine and eleven old, unpermitted landfill sites were located throughout the region at one time. With one exception (Koksilah Road Sanitary Landfill), these sites were not owned or operated by the CVRD at any time. Since 1995, the SWMP has included a commitment to close these sites; however, the ownership results indicate that the CVRD is not responsible for remediation of the sites listed in 2006 SWMP Amendment, with the exception of the Koksilah Landfill.⁹

Several burn sites, formerly operated within the CVRD, were intended to dispose of landclearing debris. The last site, the Elizabeth Compton burn pit (located in North Cowichan) was closed in 2017.

3.4.2 Illegal Dumping

Illegal waste dumping continues to occur across the region. The CVRD provides financial incentives to encourage clean-up of public lands where illegal dumping has occurred.

Tipping Fee Exemption

A “Free Tipping” policy, wherein non-profit groups that clean up public lands can dispose of collected debris for free, has been in place since the early 2000s. Between 2013 and 2016, the program received approximately 100 tonnes of material per year. The policy was recently revised to clarify tipping fee limits and incorporated into CVRD Bylaw No. 2108. Under the revised Bylaw, up to \$15,000 in tipping fee exemptions are available each year for registered charities or non-profit organizations undertaking clean-up of public lands. A further \$15,000 in tipping fee exemptions are available to businesses in the non-profit sector that may be subject to illegal dumping on their premises, such as thrift stores. Additional funding of \$1,500 is available (subject to application) for clean-up supplies.

Education Campaigns

The Hillcrest Road area is a known hotspot for illegal dumping, and in 2016, the CVRD launched a focused education campaign to reduce illegal dumping. The campaign included a partnership with the Conservation Officer Service to promote use of the Report All Poachers and Polluters (RAPP) line number to report illegal dumping, site-specific signage and messaging, and broader regional messaging encouraging all residents to report illegal dumping using the shortened RAPP number #7277. The campaign also featured shared initiative between members of the Association of Vancouver Island Coastal Communities (AVICC) to produce a short video to educate residents about illegal dumping.

The initiative was the first of its kind and allowed RDs to share the costs for production of a video that can be used in all regions. The ‘Don’t Trash Hillcrest’ campaign is estimated to have reached 25,000 residents via the CVRD Facebook page. In 2018, a similar campaign is planned to combat illegal dumping in the Shawnigan Lake area.

3.4.3 Hazardous Waste Disposal

The CVRD partners with Provincial EPR programs for collection and end-of-life disposal for several hazardous materials including flammable liquids, solvents, oil, gasoline, PCB ballasts, and mercury-containing thermostats. The CVRD does not accept hazardous materials not managed under an EPR program. The CVRD advises residents with non-EPR hazardous materials to contact licenced private companies for pick-up and disposal. The quantity of hazardous materials disposed in this manner is not known. The CVRD does not accept asbestos-containing materials (ACM) but Coast Environmental’s Duncan facility will, under special conditions collect ACM for

⁹ Cowichan Valley Regional District. Preliminary Investigation of Historical Landfill Sites in the CVRD. October 2016.

transport to authorized disposal facilities (see section 2.5.3 Processing for more information). The CVRD maintains an agreement with RDN which allows residents to drop off ACM to the RDN's regional landfill.

3.5 Finance and Administration

Solid waste management is administered under two separate budgets: one for waste services including planning, transfer station, and recycling centre operation and one for curbside collections.

3.5.1 Solid Waste Services Finances

Waste services including planning, transfer station and recycling centre operation, and roll-off hauling services, are administered under a regional solid waste management budget. The budget is primarily funded by tipping fees and by requisition (property taxes), which are collected from all CVRD residents including those within municipalities. The value of the operating budget is approximately \$7.8M (2017).

Table 3-4 summarizes the CVRD's projected budget as identified in the five-year financial plan through to 2022. CVRD's main solid waste expenses are operational costs which comprise over 50% of average annual expenses. Balanced budgets are projected from 2018 through to 2022.

Table 3-4: Solid Waste Services Budget

	2017	2018	2019	2020	2021	2022
Requisition/Parcel Tax	\$4,251,210	\$4,520,900	\$4,520,900	\$4,520,900	\$4,520,900	\$4,520,900
User Fee	\$2,841,398	\$2,541,000	\$2,541,000	\$2,541,000	\$2,541,000	\$2,541,000
Transfer from Capital Reserve	\$200,000	\$75,000	-	-	-	-
Transfer from Operating Reserve	-	\$10,000	-	-	-	-
Transfer from Gas Tax Reserve	-	-	-	-	-	-
Other	\$3,616,383	\$1,650,880	\$938,296	\$1,028,996	\$1,130,898	\$1,243,332
Debt Proceeds	\$2,445,319	\$2,470,320	-	-	-	-
Revenue Total	\$13,354,310	\$11,268,100	\$8,000,196	\$8,090,896	\$8,192,798	\$8,305,232
Operational Costs	\$7,100,014	\$7,299,677	\$7,435,471	\$7,584,180	\$7,735,863	\$7,848,297
Long Term Debt	\$621,079	\$468,639	\$264,941	\$257,514	\$232,451	\$232,451
Short Term Debt	\$120,442	\$163,484	\$163,484	\$112,902	\$88,184	\$88,184
Capital	\$5,372,184	\$3,300,000	-	-	-	-
Transfer to Capital Reserve	\$100,000	-	\$100,000	\$100,000	\$100,000	\$100,000
Transfer to Remediation Reserve	\$40,591	\$36,300	\$36,300	\$36,300	\$36,300	\$36,300
Expenses Total	\$13,354,310	\$11,268,100	\$8,000,196	\$8,090,896	\$8,192,798	\$8,305,232
Surplus/Deficit	\$-	\$-	\$-	\$-	\$-	\$-

Historically, waste tipping fee revenues have helped to fund the recycling programs offered by the CVRD. However, disposal costs have increased in recent years, in part due to increased export and shipping costs, and the decline in value of the Canadian dollar. This means there is less revenue available to support recycling programs. The

waste tipping fee increased gradually between 1987 and 2012 to offset rising disposal and operating costs, but has not increased since 2012 due to concerns that additional increases would exacerbate the loss of waste to lower cost landfills outside of the region. The high tipping fee is one of the primary reasons that waste tonnages have declined during recent years, although reduced economic activity and the success of diversion programs have likely also played a role. Requisition rates have increased to offset this lost revenue.

3.5.2 Curbside Collection Finances

The CVRD curbside collection program is managed under a separate budget, which is funded through user fees and payments from Recycle BC for provision of packaging and printed paper (PPP) collection. The value of the curbside collection budget is approximately \$2.0M (2017). The curbside collection budget has been relatively stable since the transition to in-house collection in 2013. User fees have not increased since 2012, however, an increase should be considered for 2019 to ensure the program remains adequately funded.

Table 3-5 summarizes the CVRD's projected curbside collection budget as identified in the five-year financial plan through to 2022. The bulk of expenses are operational costs, which comprise 87% of annual expenses. Balanced budgets are project from 2018 to 2022.

Table 3-5: Curbside Collection Budget

	2017	2018	2019	2020	2021	2022
Requisition/Parcel Tax	-	-	-	-	-	-
User Fee	\$787,946	\$797,500	\$1,135,787	\$1,121,296	\$1,107,458	\$1,094,284
Transfer from Capital Reserve	-	-	-	-	-	-
Other	\$488,000	\$493,400	\$493,400	\$493,400	\$493,400	\$493,400
Debt Proceeds	-	-	-	-	-	-
Surplus/(Deficit)	\$720,177	\$571,253	\$264,913	\$311,989	\$359,065	\$406,141
Revenue Total	\$1,996,123	\$1,862,153	\$1,894,100	\$1,926,685	\$1,959,923	\$1,993,825
Operational Costs	\$1,731,303	\$1,597,333	\$1,629,280	\$1,661,865	\$1,695,103	\$1,729,005
Long Term Debt	\$144,820	\$144,820	\$144,820	\$144,820	\$144,820	\$144,820
Short Term Debt	-	-	-	-	-	-
Capital	-	-	-	-	-	-
Transfer to Capital Reserve	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
Expenses Total	\$1,996,123	\$1,862,153	\$1,894,100	\$1,926,685	\$1,959,923	\$1,993,825

4.0 SYSTEM GAPS AND OPPORTUNITIES

While the solid waste management system in CVRD is well established, there are still gaps and potential opportunities to further optimize waste reduction, diversion and recycling. The items below are currently listed to align in order of the 5 Rs of the pollution prevention hierarchy within Section 3.0. They highlight key gaps and opportunities for further analysis and potential options development. Once the Solid Waste Management Plan Advisory Committee (PAC) provides input, the next steps will be to prioritize and further expand upon opportunities as informed by the March 29 meeting outcomes and industry trends.

Reuse and Reduction Programs

There is potential to further enhance and increase access for programs for reuse and reduction, including building local food rescue capacity, implementing reuse platforms such as repair cafes, tool libraries, reclamation of building supplies, and banning use of disposable plastic shopping bags.

Education and Behaviour Change

Ongoing education and fostering behaviour change is important for the continued success of existing solid waste management programs, and is especially critical when implementing new initiatives or expanding existing programs. Continuing to integrate a community-based social marketing approach can help to ensure that engagement programs are designed to overcome barriers and build on motivators to participation as community and business members adopt new behaviours and support successful programs.

Organics Processing Capacity

Regional composting capacity has grown significantly since the 2006 SWMP update; however, some facilities are nearing capacity as composting programs continue to evolve. As capture increases for existing collection and organics collection expands, there is concern that the region may lack adequate processing capacity. Given the higher percentage of putrescibles in feedstock mixes, facilities are more susceptible to odour incidents, which poses a threat to organics management processing infrastructure, which has resulted in organics processing facility shut downs in nearby jurisdictions.

Organics and Recycling Programs for ICI & MF

ICI and MF sectors currently have inconsistent collection services levels for recycling and organics. More uniform requirements in concert with augmented services could significantly increase capture for recyclables and organic material shown in significant percentages in recent waste composition studies as shown in Section 2.4.2.

Improve Southern CVRD Services

Approximately 20% of the population lives in the south end of the CVRD (Electoral Areas A, B, and C) where there are currently no public depots. Residents contribute to the region-wide services through taxation but do not have proximate access to these services. There are no public curbside collection programs for garbage or organics in the south end.

Expanded Curbside Collection

While recycling collection exists across the region, garbage and organics curbside collection is not in place throughout the CVRD. Public garbage collection occurs only in Electoral Areas D, E, F, G, and I (and through a private sector 'opt in' subscription basis in Electoral Area H). Private curbside garbage (and organics) collection is available to Electoral areas A, B, and C residents on a subscription basis. Comparison across jurisdictions shows that expanded curbside collection to include all three material streams (recyclables, organics and garbage) can significantly reduce garbage tonnage by 35-40%.

Construction and Demolition

There are opportunities to further recover recyclable materials from C&D waste. Markets continue to fluctuate which affects how wood waste can be utilized; other opportunities may exist to develop markets within the region or leveraging inter-jurisdictional opportunities for material reuse, re-manufacturing and/or energy recovery.

Expansion of EPR Programs

The CVRD supports the expansion of EPR programs for new products such as textiles (which comprise up to 11.9% of the waste stream in Electoral Areas) and bulky furniture (e.g., mattresses, couches, and chairs). The CVRD currently pays to operate a recycling program for these materials. Advocating senior governments to expand products covered under the BC Recycling Regulation could help to address materials management for these items.

Local Solid Waste Management Capacity

The CVRD lacks local solid waste disposal capacity. Garbage is exported to the Roosevelt Regional Landfill in Washington State. There are also solid waste infrastructure gaps to address related to ICI sector single-stream recyclables requiring processing, and how hazardous waste is collected and processed, particularly for larger commercial volumes, in the region.

Illegal Dumping

Illegal dumping continues to be a challenge in the region. The costs and ubiquity of illegal dumping should be analyzed to determine whether changes need to be made to the current system, and if there are regulatory and behaviour change programs that can be augmented to mitigate illegal dumping issues.

Emergency Management Plan

The CVRD currently does not currently have an emergency/disaster management plan for how to manage solid waste in the event of a natural disaster. Several Canadian municipalities, such as BC Regional Districts including Cariboo and Fraser Fort George as well as several Alberta regions have recently been affected by fires and floods. These types of disasters generate a significant amount of extra solid waste within a short period and require a management plan to deal with the large amounts or different types of waste that will require disposal or staging.

5.0 LIMITATIONS OF REPORT

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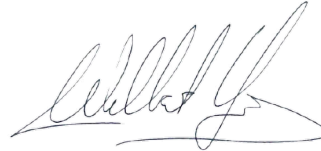
6.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

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APPENDIX A

LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

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In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX B

STATUS OF 2006 SWMP INITIATIVES

Solid Waste Management Plan Amendment No. 3 (2006) contains 54 planned initiatives relating to regulations, waste reduction, reuse, recycling, recovery, and residual waste management. Initiatives from each category are outlined in the table below along with comments on implementation. The status of each initiative is classified as one of the following:

- Complete: Item has been implemented or addressed and no further action is required;
- In-Progress: Item has been started and more effort is required to complete;
- Ongoing: Item has been implemented and is part of regular business;
- Incomplete / On-Hold: Item should be revisited and either cancelled or carried into the upcoming SWMP Amendment; and
- Cancelled: Item is no longer relevant or applicable.

Planned Initiative	Status
2.3 Regulation of Solid Waste Management System	
Final Adoption and implementation of CVRD Bylaw No. 2020 in 2007, with education and enforcement measures to support as required	Complete
Continued implementation of CVRD Bylaw No. 2570. Subsequent to issuing the majority of licenses for existing waste management facilities by early 2007, the CVRD will direct waste materials to licensed facilities only and proceed with enforcement measures against unlicensed facilities, in accordance with the Enforcement Policies and Procedures document. A list of facilities holding valid waste stream licenses will be maintained on the CVRD website, as will any facilities in non-compliance	Complete
Sustained, progressive enforcement of the material ban provisions of CVRD Bylaw No. 2108, with targeting of materials and generating sectors to be determined through observation of the incoming residual waste stream	On-hold, pending Bylaw review
Evaluate the impacts of expanding the commercial food waste ban provisions of CVRD Bylaw No. 2108 to include post-consumer commercial food waste (i.e. restaurant plate scrapings etc.), and de-packaging where feasible, with possible implementation to follow	On-hold, pending Bylaw review
Ongoing evaluation of the effectiveness of the existing regulatory structure in achieving CVRD waste management objectives. Development of new or expanded bylaws may be initiated in response to identified needs.	Ongoing
2.4 Waste Reduction	
Publish the Environmental Guide and Recycling Directory primarily in an on-line format. The Guide will also be printed and distributed locally on a periodic basis;	Complete
Publication of Earth Issues, Our Lifestyles and the Environment, a CVRD- produced environmental education manual targeting Kindergarten to Grade 5 students	Complete
Continued efforts to minimize the amount of waste generated by internal CVRD operations, which may include development of an Environmental Management System	Cancelled
2.5 Reuse	
Promotion of material and product reuse and repair opportunities available within the Cowichan region through the Environmental Guide and Recycling Directory and CVRD Recycling Hotline	Complete
Support for the Cowichan Recycling Exchange service offered in partnership with Cowichan News Leader/ Pictorial newspaper and promotion of the RCBC Materials Exchange, and other such waste exchanges	Complete
Implementing a trial period for 'Free Store' facilities at the Bings Creek Solid Waste Management Complex and the Peerless Road Recycling Drop-off Depot where unwanted, but useable items can be placed for removal and reuse by others	Complete

Planned Initiative	Status
2.6 Recycle	
Promotion of Recycling Opportunities	
Outreach and education efforts focused around planned CVRD programs diverting food waste from the residential and commercial residual waste streams	Ongoing
Promotion of any new opportunities for material recycling at CVRD-operated or privately operated solid waste facilities	Ongoing
Evaluate the need for a region-wide initiative to support private haulers and local municipalities in promoting and delivering recycling services to multi-family dwellings	On-hold pending further review
Promotion of free yard and garden tipping at CVRD facilities and other alternatives to burning yard waste	Ongoing
Focused efforts to optimize participation in curbside recycling programs	Complete
Curbside Recycling Collection Programs	
Pending support from member municipalities, the CVRD will evaluate the feasibility of collectively tendering all contracted-out curbside-collection contracts within the region so that the CVRD and local municipalities may benefit from a 'buying in bulk' approach	Cancelled
The CVRD will evaluate the feasibility of integrating residential food waste collection with existing curbside waste and recycling collection programs within the region. Evaluation will be conducted in partnership with local municipalities, industry stakeholders, and rural and urban residents	In-Progress
If the feasibility of a food waste collection services can be established, the CVRD will pursue region-wide implementation of residential food waste collection	On-hold
Multi-Product Neighbourhood Recycling Bins	
The CVRD will evaluate phasing-out the Multi Bin Program in the 2008 to 2012 period. If the region-wide program is discontinued, multi bins, or similar equipment, will remain in place at CVRD Recycling Drop-off Depots	Complete
Commercial & Multi-Family Recycling	
Continue to emphasize the existing material ban provisions of CVRD Bylaw No. 2108 to encourage local businesses to make use of recycling opportunities	Ongoing
Evaluate the impact on the hauling sector and local business community of expanding the commercial food waste ban to include post-consumer food waste	On-hold
In consultation with local municipalities and local haulers, the CVRD will evaluate the need for new initiatives targeting increased waste diversion from the commercial and multi-family sectors.	On-hold
CVRD Recycling Facilities	
Develop "Free Side" and "Paid Side" Traffic Streams. In order to maximize convenience for residents accessing CVRD recycling facilities, the CVRD will assess the feasibility of modifying traffic flow at CVRD recycling sites to allow residents to drop off free recyclable materials without requiring these materials to cross the scale	Complete
Food Waste Tipping and Transfer Area. In support of upcoming CVRD initiatives targeting diversion of food waste, a dedicated tipping area will be developed at Bings Creek for transfer of large quantities of organic waste. A container for drop off of residential organics will also be provided at Bings Creek	Complete
On-site material processing. Consistent with the CVRD's intention to minimize the cost of hauling recyclable materials collected at CVRD facilities, the CVRD will evaluate the feasibility of providing on-site processing at Bings Creek for some materials. Materials being considered for some on-site processing are wood waste, yard and garden waste, and food waste, amongst others.	Complete
Develop a South-end Depot. To ensure that Cobble Hill, Mill Bay, Shawnigan Lake and Cowichan Bay residents have convenient local access to recycling facilities, the CVRD will develop a full-service waste recycling drop-off depot in the southern part of the region.	On-hold

Planned Initiative	Status
Improved recycling infrastructure. The CVRD plans to re-develop the west side of the residential tipping area at Bings Creek to facilitate recycling. Planned improvements include: installing a stationary compactor for management of cardboard; providing a permanent building for the Free Store; improved enclosures for management of hazardous materials.	Complete
Multi-Material Recycling	
The CVRD will encourage sound environmental management at Vancouver Island Recycling Centre, consistent with the standards in place for licensed facilities	Cancelled
The CVRD will continue to support private sector materials recovery facilities through the ongoing expansion of recycling programs	Ongoing
Construction & Demolition Waste	
The CVRD will continue to promote opportunities for residents to use licensed private C&D waste processing facilities	Ongoing
The CVRD will support licensed C&D recycling facilities through pursuing enforcement measures against unlicensed facilities	Ongoing
In co-operation with its member municipalities and the building trades, the CVRD will develop a requirement that construction and demolition projects provide the opportunity for salvage of materials	On-hold pending feasibility review
The CVRD will seek agreements with its member municipalities to ensure that specific sorting and waste segregation requirements are applied following material salvage. This agreement would be a condition of all new building construction and demolition permits issued within the CVRD boundaries. The CVRD will develop program guidelines to assist local builders in establishing effective site sorting techniques and waste reduction programs.	On-hold pending feasibility review
Landclearing Debris	
In support of ongoing efforts to improve local air quality, the CVRD will promote non-burning management practises, such as mulching and composting, for locally generated landclearing debris. The CVRD will also enforce the provisions of CVRD Bylaw No. 2020, which regulate open burning of landclearing debris	Ongoing
Composting	
Continue to hold a sale of backyard composters every second year with the cost to residents for each unit significantly subsidized by the CVRD	Cancelled
Year-round free tipping of yard and garden waste at CVRD Recycling Drop-off depots	Ongoing
Support licensed composting facilities through development of curbside food waste collection services. Prior to developing this service, the CVRD will evaluate the capacity of local composting facilities to accept materials collected through this service	In-Progress
Enforce CVRD Bylaw No. 2108 prohibitions on disposal of commercial organic waste	On-hold pending Bylaw review
Improve tipping and transfer of residential and commercial food waste at Bings Creek	Complete
Hazardous Materials	
Cooperating and assisting with the promotion of provincial initiatives	Ongoing
Incorporating household hazardous waste into the overall education and partnership programming	Ongoing
Promoting waste exchanges and swap days for materials, such as paint, that are developed by local community groups or provincial manufacturing associations	N/A
2.7 Recovery	
To evaluate the feasibility of the three types of technology – Gasification, Refuse Derived Fuel, and Waste-to-Energy processes, considered most likely to be a viable option for managing CVRD / RDN residual waste	Complete
Evaluate each technology's potential markets for producing fuel, power, steam or other products from the residual waste streams	Complete
To identify considerations and a time frame for initiating a Request for Proposals process for selecting a specific waste management technology.	Cancelled
2.8 Residual Waste Management	

Planned Initiative	Status
Residual Waste Collection	
Encourage member municipalities to implement further can limits and/or reduced collection frequency	Cancelled
Apply enforcement of material bans (i.e. yard waste) to municipal collection crews	Ongoing
Support and assist local municipalities in integrating food waste collection into their existing waste collection protocols	Cancelled
Residual Waste Transfer	
Provide capacity for drop-off of self-hauled residual waste at the planned South-end Recycling Drop-off Depot.	Cancelled
The CVRD will evaluate the feasibility of, and possibly develop, a residual waste tipping area for residential and small commercial self-haul customers adjacent to the main tipping floor	Complete
The CVRD will evaluate the benefits of cost savings and operational flexibility that may result from purchasing a roll off truck and containers for local materials transfer. If cost savings can be established, the CVRD may proceed with vehicle purchase or lease	Complete
Non-CVRD Residual Disposal	
The CVRD will continue to monitor the flow of residual waste from the region. If ongoing evaluation indicates that the CVRD's overall objectives for management of regional solid waste are compromised by changes in private sector disposal practices, the CVRD will consult with local industry regarding regulatory and non-regulatory approaches to discouraging use of non-CVRD disposal facilities.	On-hold
Illegal Residual Waste Disposal	
The CVRD will continue to offer all existing programs to reduce the prevalence of illegal dumping within the CVRD. Following the completed closure of CVRD ash landfills, the CVRD will initiate investigations of the illegal dump sites and develop an overall strategy for their closure.	Complete

APPENDIX C

RECYCLABLE MATERIALS ACCEPTED AT CVRD FACILITIES

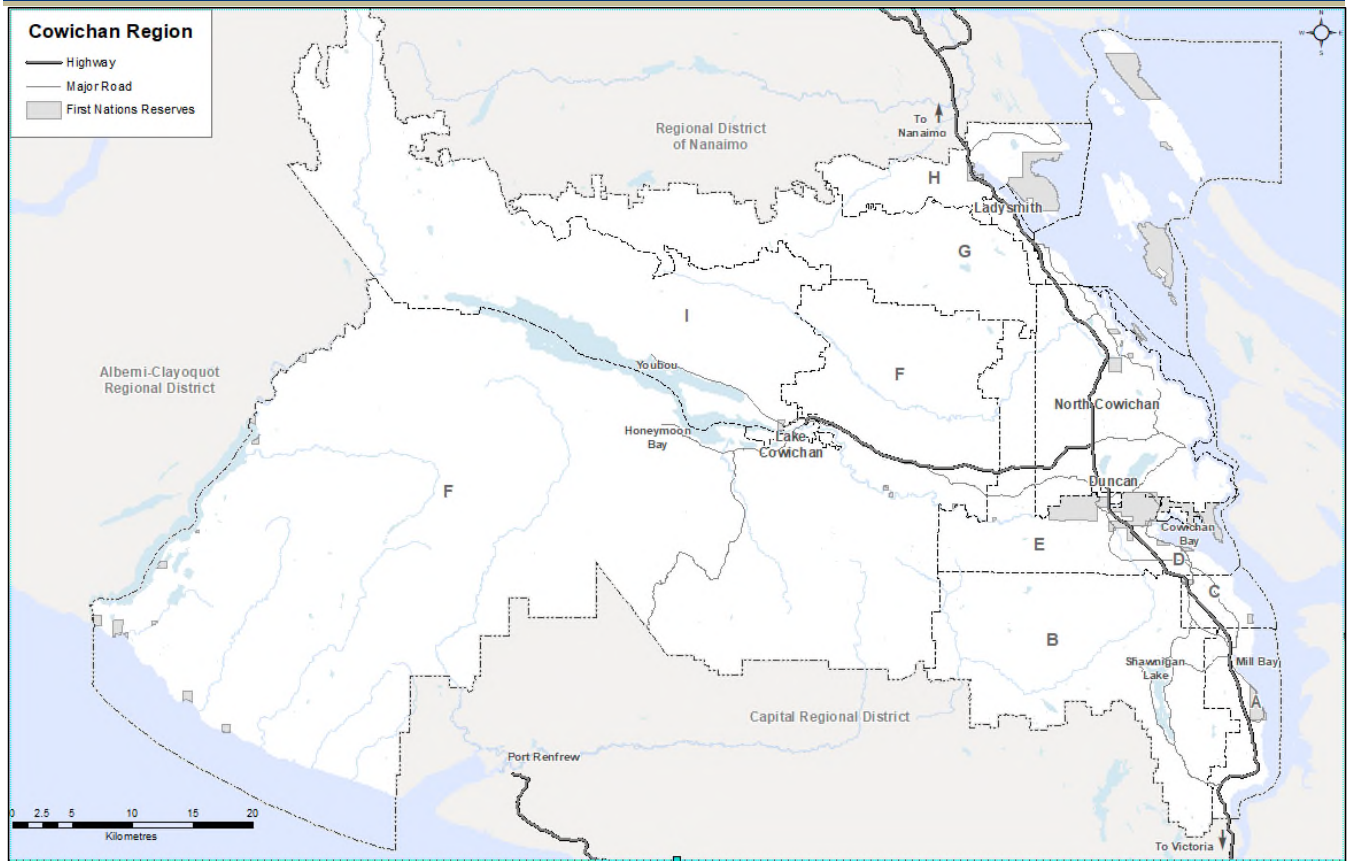
Materials	Bings Creek Recycling Centre & Transfer Station	Peerless Road Recycling Centre	Meade Creek Recycling Centre	Central Landscape Supplies	Coast Environmental Duncan	Coast Environmental Chemainus	Cowichan Energy Alternatives	Fisher Road Recycling	Hillside Stone and Garden	Schnitzer Steel Canada	Stone Pacific Contracting	Island Return-It Bottle Depot (Duncan)	Island Return-It Bottle Depot (Cobble Hill)	Junction Bottle Depot (Ladysmith)
Garbage														
Air Conditioners														
Antifreeze and Containers														
Small Appliances														
Large Appliances														
Batteries														
Books														
Cellphones and Chargers														
Couches and Armchairs														
Clothing														
Construction and Demolition Waste														
Drywall														
Electronics														
Fridges and Freezers														
Gas and Fuel														
Glass														
Insulation (Garbage)														
Lights and Lighting Fixtures														
Lumber and Wood														
Mattresses														
Metal														
Used Needles / Syringes														
Oil														
Oil Filters and Containers														
Vegetable Oil														
Organics (Food Waste)														
Outdoor Power Tools														
Paint														
Packaging and Printed Paper ¹														
Pesticides (Domestic)														
Plastic Bags, Film Plastic and Overwrap ¹														

Materials	Bings Creek Recycling Centre & Transfer Station	Peerless Road Recycling Centre	Meade Creek Recycling Centre	Central Landscape Supplies	Coast Environmental Duncan	Coast Environmental Chemainus	Cowichan Energy Alternatives	Fisher Road Recycling	Hillside Stone and Garden	Schnitzer Steel Canada	Stone Pacific Contracting	Island Return-It Bottle Depot (Duncan)	Island Return-It Bottle Depot (Cobble Hill)	Junction Bottle Depot (Ladysmith)
Hard (Rigid) or Oversized Plastic														
Power Tools														
Propane Tanks														
Refundable Beverage Containers														
Roofing														
Rubble - Class 1														
Rubble - Class 2														
Smoke and Carbon Monoxide Alarms														
Solvents and Flammable Liquids														
Thermostats														
Tires														
Vehicle Batteries														
Yard Waste														

APPENDIX D

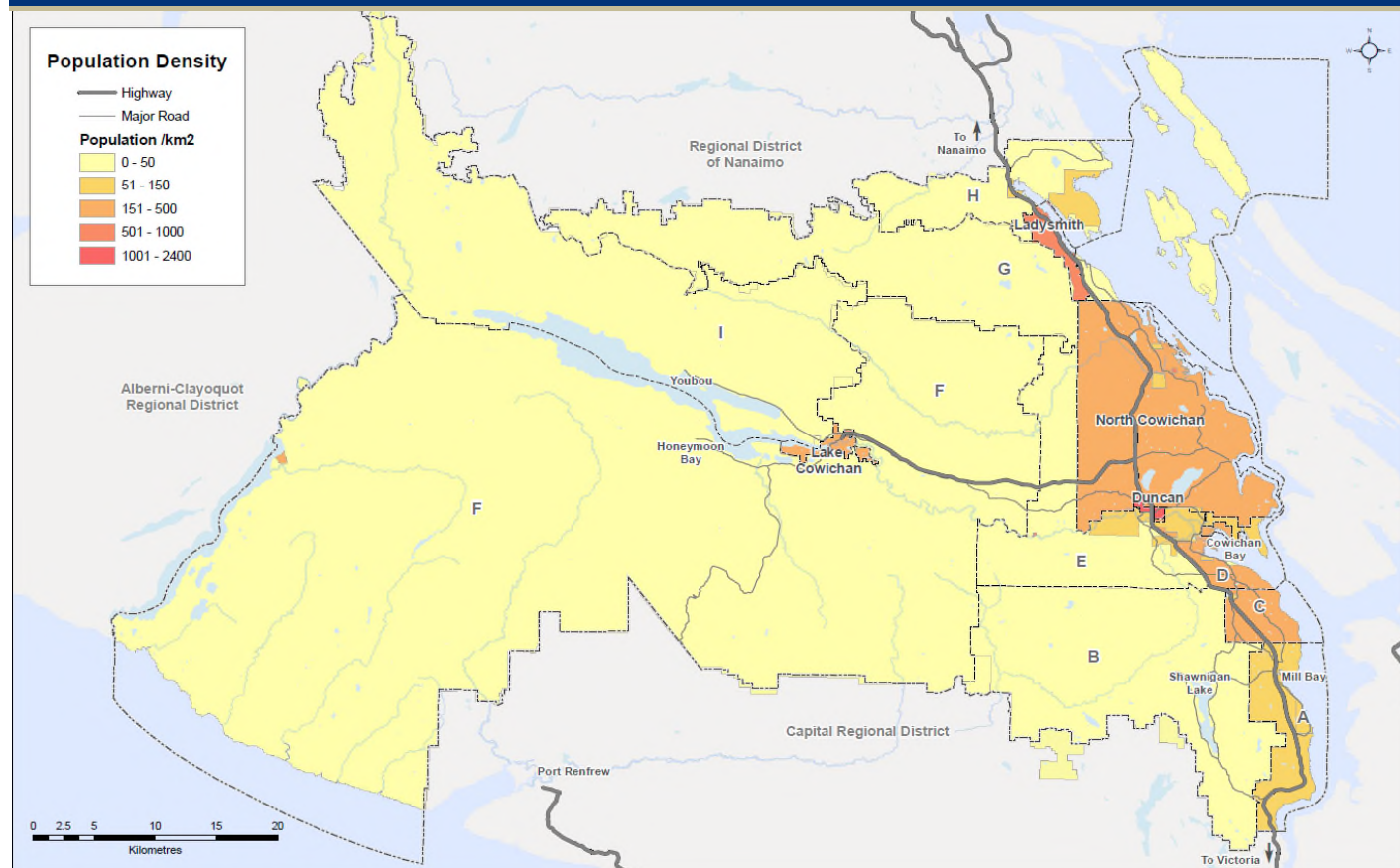
CVRD MAPS

MAP 1: COWICHAN VALLEY REGIONAL DISTRICT



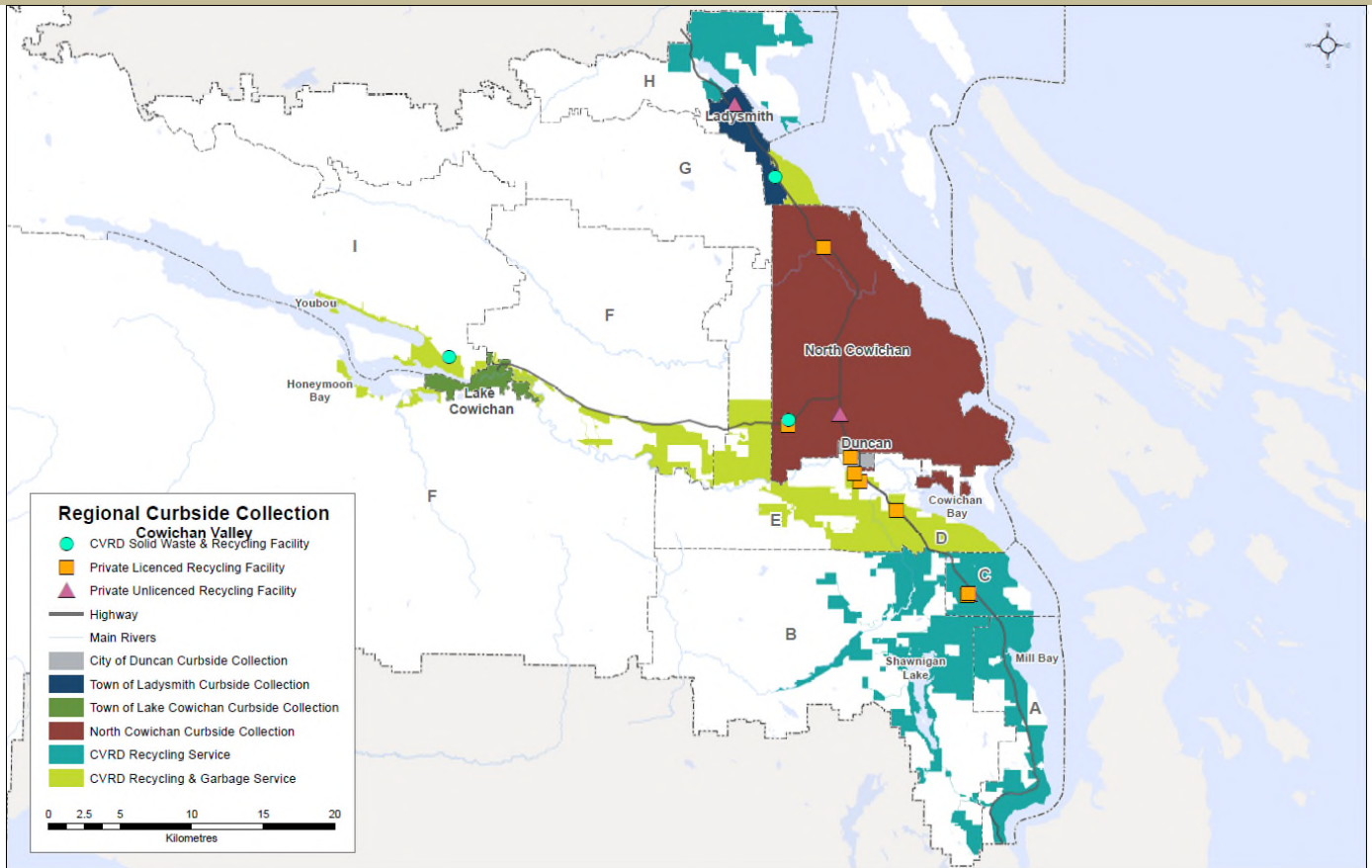
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MAP 2: POPULATION DENSITY

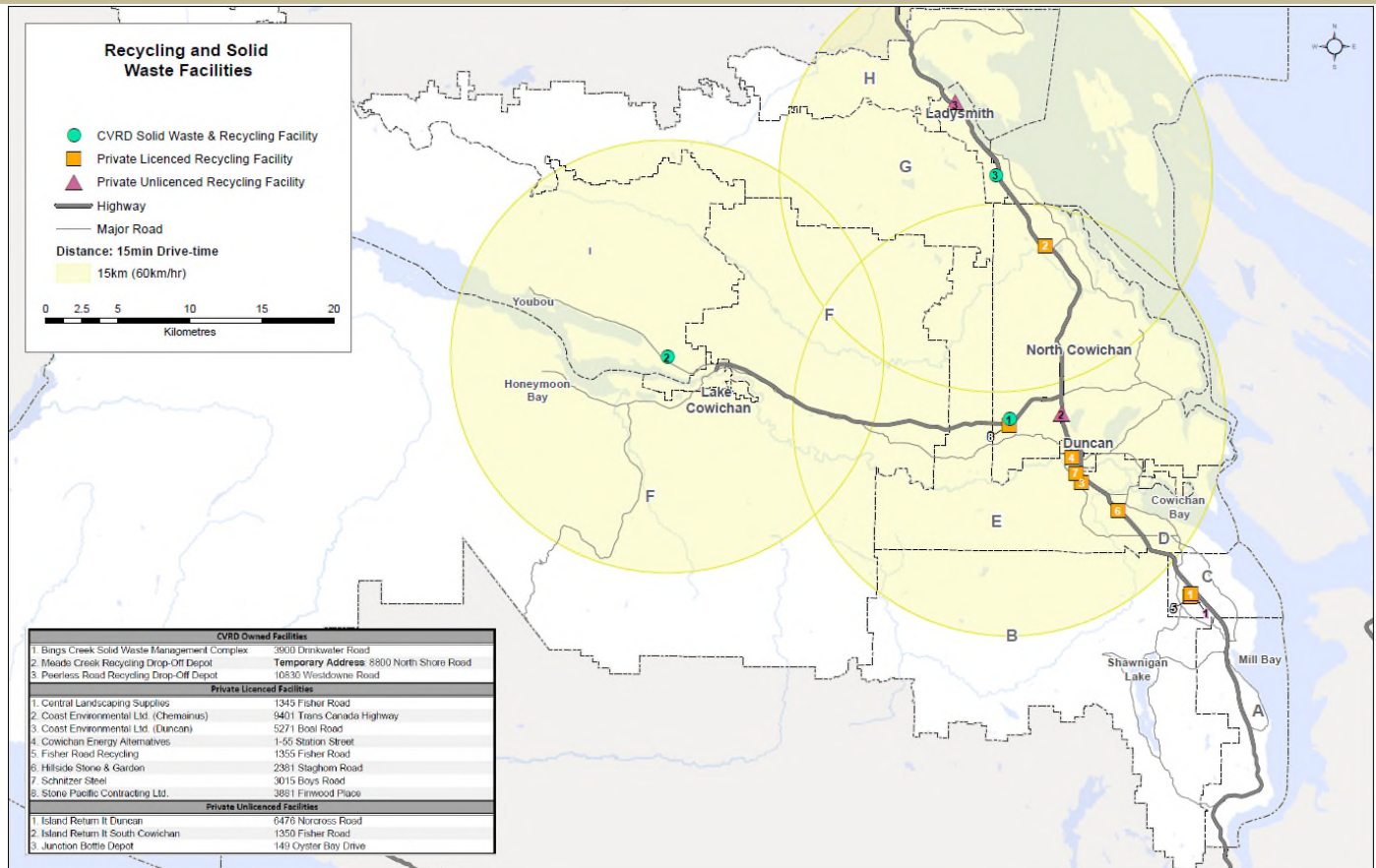


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MAP 3: CURBSIDE COLLECTION SERVICES



Map 4: CVRD Recycling Centres



APPENDIX E

WASTE COMPOSITION RESULTS

Waste Composition Results – All Categories by Sector and Overall Average

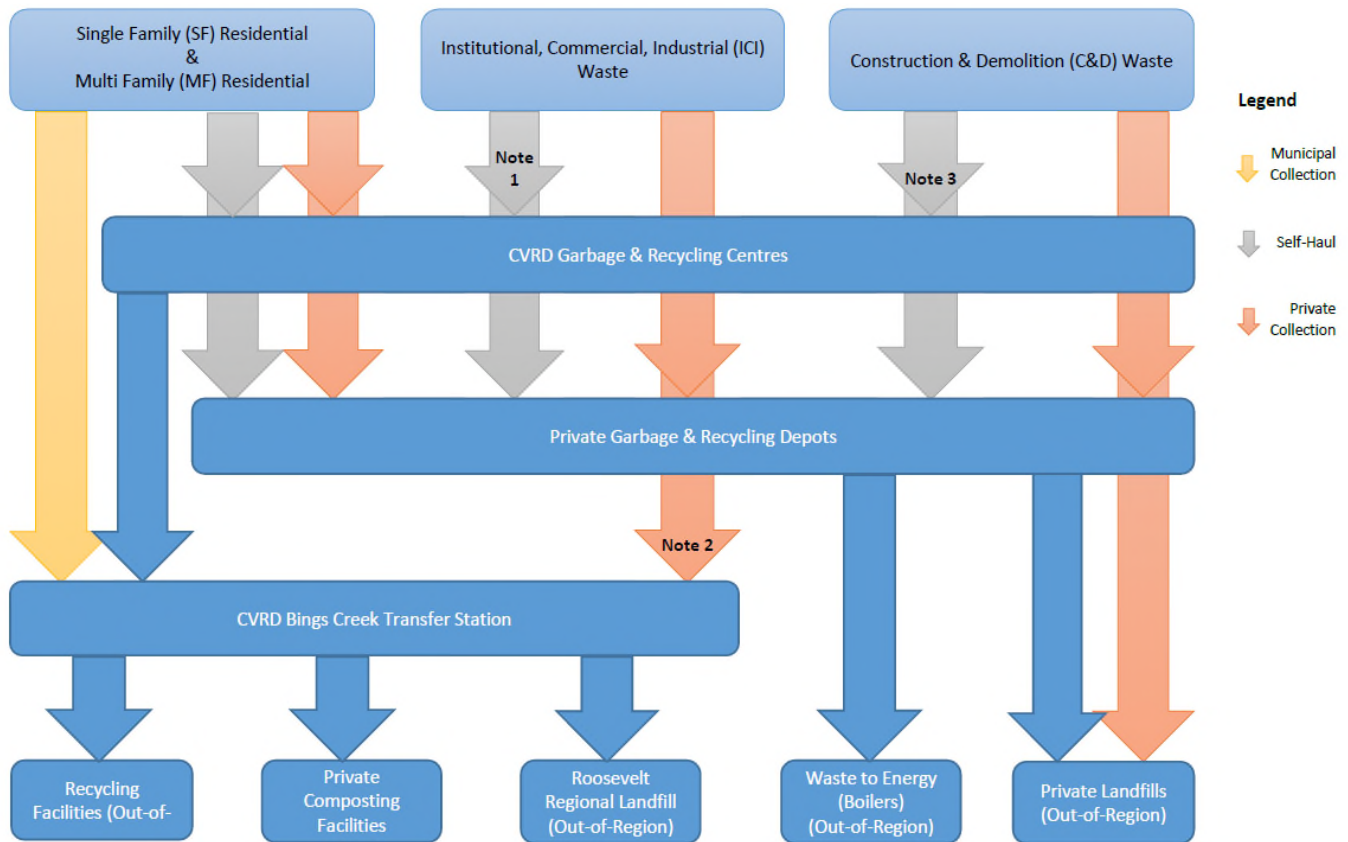
Category	ICI	MF	SF	DO	C&D	Averag	kg/capit
Paper							
Beverage Container - deposit	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.2
Packaging – liquids	0.3%	0.5%	0.3%	0.1%	0.0%	0.2%	0.7
Printed Paper	4.8%	7.7%	2.8%	1.7%	0.0%	3.0%	10.4
Packaging – OCC	1.0%	0.4%	0.3%	1.0%	0.9%	0.8%	2.8
Packaging – liquid containers (beverage cups)	1.2%	0.7%	0.6%	0.6%	0.0%	0.6%	2.2
Packaging – composite cans	0.2%	0.1%	0.1%	0.0%	0.0%	0.1%	0.3
Books	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%	0.2
Compostable Paper	6.7%	6.8%	7.8%	1.2%	0.0%	4.4%	15.3
Packaging – Waxed OCC	1.0%	0.0%	0.3%	0.0%	0.0%	0.4%	1.3
Other Paper	1.6%	0.6%	0.8%	0.8%	2.4%	1.4%	5.0
Subtotal	16.9%	17.1%	13.2%	5.4%	3.2%	11.1%	38.4
Plastics							
Beverage Container - deposit	0.3%	0.2%	0.1%	0.3%	0.0%	0.2%	0.6
Plastic Packaging - Non-beverage #1-7	3.1%	2.8%	2.5%	1.2%	0.0%	1.9%	6.7
Plastic Packaging - #6 Styrofoam, foam	1.2%	0.5%	1.1%	1.6%	0.0%	0.9%	3.2
Plastic Packaging - Film, #2, #4 (grocery bags, packing)	0.9%	1.0%	2.0%	0.4%	0.0%	0.8%	2.8
Plastic Packaging - Other films	7.0%	3.7%	7.3%	0.8%	0.9%	4.3%	15.0
Other Plastics - Uncoded (straws, forks)	0.6%	0.4%	0.4%	0.4%	0.0%	0.4%	1.3
Other Plastics - Durable plastic products	1.5%	2.3%	2.2%	16.7%	20.0%	8.7%	30.1
Subtotal	14.7%	11.0%	15.6%	21.4%	20.9%	17.2%	59.7
Compostable Organics							
Yard and Garden	0.7%	6.7%	2.0%	0.4%	1.1%	1.5%	5.1
Food waste – non-backyard compostable (unavoidable) - bones/cartilage	8.9%	8.1%	9.8%	0.7%	0.0%	5.5%	19.2
Food waste – backyard compostable (unavoidable)	0.6%	0.1%	0.8%	0.2%	0.0%	0.4%	1.3
Food waste – avoidable	24.5%	14.0%	12.1%	1.4%	0.0%	11.7%	40.6
Food waste – donatable	10.0%	3.2%	3.7%	0.7%	0.0%	4.3%	15.1
Clean wood	0.9%	0.4%	0.6%	2.8%	0.0%	0.9%	3.1
Other Compostable Organics	0.0%	0.4%	0.1%	0.5%	0.0%	0.1%	0.5
Subtotal	45.6%	32.9%	29.0%	6.6%	1.1%	24.4%	84.9
Non-Compostable Organics							
Rubber	0.8%	0.1%	0.9%	0.9%	2.2%	1.1%	3.9
Contaminated Wood	1.7%	2.7%	1.2%	11.9%	37.3%	11.9%	41.4
Other Non-Compostable Organics	0.2%	0.1%	0.3%	0.2%	0.0%	0.2%	0.5
Subtotal	2.7%	3.0%	2.4%	13.0%	39.5%	13.2%	45.8
Textiles							
Clothing	1.5%	3.2%	4.0%	1.4%	0.1%	1.7%	6.0
Footwear	0.4%	0.6%	0.7%	1.1%	0.0%	0.5%	1.7

Category	ICI	MF	SF	DO	C&D	Averag	kg/capit
All other textiles	2.6%	1.4%	2.6%	5.1%	1.0%	2.5%	8.9
Subtotal	4.5%	5.2%	7.3%	7.7%	1.1%	4.8%	16.6
Metals							
Beverage Container	0.6%	0.3%	0.1%	0.1%	0.1%	0.3%	1.0
Metal Packaging	1.4%	1.8%	1.5%	0.3%	0.0%	0.9%	3.3
Other Metals	0.7%	0.6%	1.4%	3.0%	0.9%	1.2%	4.3
Subtotal	2.8%	2.6%	2.9%	3.4%	1.0%	2.5%	8.5
Glass							
Beverage Container	0.3%	0.4%	0.3%	0.3%	0.0%	0.3%	0.9
Glass packaging (food containers)	0.7%	0.8%	1.0%	0.2%	0.0%	0.5%	1.8
Other glass	0.6%	0.9%	1.0%	1.4%	0.0%	0.7%	2.4
Subtotal	1.7%	2.2%	2.4%	1.9%	0.0%	1.5%	5.1
Building Material							
Gypsum/drywall, plaster	0.0%	0.0%	0.6%	5.6%	0.0%	1.0%	3.6
Rigid Asphalt Products	0.0%	0.0%	0.3%	0.2%	0.0%	0.1%	0.3
Carpet Waste	1.0%	0.6%	0.7%	7.7%	0.0%	1.8%	6.1
Other Building Material	0.1%	1.2%	1.1%	8.2%	12.8%	4.8%	16.6
Subtotal	1.1%	1.8%	2.7%	21.6%	12.8%	7.7%	26.6
Electronics							
Computers and Entertainment	0.2%	2.0%	0.2%	0.7%	0.0%	0.4%	1.2
Lighting Equipment	0.1%	0.5%	0.2%	0.3%	0.0%	0.2%	0.6
Smoke/CO Alarms	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
Thermostats (Non-Mercury Containing)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
Electronic Toys	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
Outdoor Power Equipment	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0
Small Appliances and Power Tools	0.3%	0.1%	0.3%	1.2%	0.0%	0.4%	1.3
Major Household Appliances	0.0%	2.4%	0.0%	0.0%	0.0%	0.2%	0.7
Other Electronics	0.1%	0.0%	0.4%	0.3%	0.0%	0.1%	0.5
Subtotal	0.6%	5.0%	1.2%	2.5%	0.0%	1.2%	4.3
Household Hazardous							
Batteries	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%	0.2
Lighting Equipment	0.1%	0.1%	0.0%	0.1%	0.0%	0.1%	0.2
Oil and Antifreeze	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.1
Solvent and Flammable Liquids	0.0%	0.0%	0.2%	0.4%	0.0%	0.1%	0.4
Paint	0.1%	0.2%	0.3%	0.6%	0.0%	0.2%	0.7
Pesticides	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
Fertilizers	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.1
Medications	0.0%	0.2%	0.1%	0.0%	0.0%	0.1%	0.2
Cosmetics	0.3%	1.3%	0.4%	0.2%	0.0%	0.3%	1.0
Mercury Containing Items	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
Other Hazardous Waste	0.0%	0.0%	0.2%	0.5%	0.0%	0.1%	0.4
Subtotal	0.6%	2.0%	1.5%	2.1%	0.0%	1.0%	3.4

Category	ICI	MF	SF	DO	C&D	Averag	kg/capit
Household Hygiene							
Biological – Diapers	4.7%	7.7%	7.9%	0.3%	0.0%	3.7%	12.7
Biological – Pet Waste	1.5%	5.8%	9.8%	0.4%	0.0%	2.8%	9.8
Other Biological	0.8%	1.5%	1.8%	0.0%	0.0%	0.7%	2.5
Subtotal	7.0%	14.9%	19.4%	0.8%	0.0%	7.2%	25.1
Bulky Objects							
Bulky Objects	0.4%	0.0%	0.1%	12.9%	3.3%	3.1%	10.7
Subtotal	0.4%	0.0%	0.1%	12.9%	3.3%	3.1%	10.7
Other							
Fines	1.5%	2.3%	2.3%	0.7%	1.1%	1.5%	5.2
Subtotal	1.5%	2.3%	2.3%	0.7%	1.1%	1.5%	5.2
Grand Total	100.0%	100.0	100.0	100.0	100.0	100.0%	347.6

APPENDIX F

WASTE FLOW IN CVRD



Note 1: Limited types of self-haul recyclables are accepted from ICI
 Note 2: Only ICI garbage and organics accepted in self-tipping vehicles are allowed at Bings Creek
 Note 3: Small quantities only, asbestos not accepted

Technical Memorandum 2

Preliminary Options for Consideration for Plan Update

To: Tauseef Waraich
Harmony Huffman

Date: October 17, 2018

c:

Memo No.: 2

From: Melissa Nielsen
Wilbert Yang

File: 704-SWM.PLAN03006-01

Subject: Preliminary Options for Consideration for Plan Update

1.0 INTRODUCTION

The Cowichan Valley Regional District (CVRD) retained Tetra Tech Canada Inc. (Tetra Tech) to support the review and update of the CVRD's Solid Waste Management Plan (SWMP). The 2018 Draft SWMP Update will review existing solid waste management policies and programs; identify and evaluate options for reduction and diversion, residual management, and financing; and set the regional district's waste management principles, targets and strategies for the next ten years. A summary of the project phases that encompasses solid waste management planning process is included in Table 1-1.

Table 1-1: Project Deliverables

Phase		Deliverable
1	Initiate the Planning Process	▪ Technical Memorandum (Tech Memo) 1 - Current Solid Waste Management System Overview
2	Set the Plan Direction	▪ Consultation Plan ▪ Tech Memo 2 - Options: 3 R's and Residual Management (this document)
3	Evaluate Options	▪ Tech Memo 3 - Finances and Option Selection
4	Prepare and Adopt the Plan	▪ Draft Solid Waste Management Plan ▪ Consultation Summary Report
5	Plan to Implement, Monitor, and Report	▪ 2018 Solid Waste Management Plan

Phase 1 (Initiation) included the Current Solid Waste Management System Overview (Tech Memo 1) that was presented at the Plan Advisory Committee (PAC) meeting on March 29, 2018. The technical memorandum documents the current condition of the CVRD's solid waste management system, and provides a basis for the options presented herein. This document is the second technical memorandum (Tech Memo 2) created for the SWMP process (as described in Table 1-1).

1.1 Purpose

The purpose of this tech memo is to present all options identified in a gap analysis for further review.

To determine areas for focus for the Plan Update, the following steps will be completed:

1. The CVRD and the PAC will review Guiding Principles for the Plan Update, which will be used as evaluation criteria for option selection. Eight Guiding Principles have been established by the Ministry (Section Figure 1-1); it will be determined whether any CVRD-specific Guiding Principles should be considered.
2. The CVRD and the PAC will discuss and consider a long list of options (herein).
3. The CVRD and Tetra Tech will evaluate the long list of options according to the Guiding Principles and input from the PAC and the public. This should result in a preliminary short-list of options.
4. The CVRD and the PAC will discuss and approve the short-list of options.

The next and final technical memorandums will assess the financial implications and synergies of the short-listed options for integration into the 2018 SWMP Update.

Concurrently with the Options Selection process (Phases 2 and 3 in Table 1-1), public consultation will be undertaken via an open house and a survey.

Once the options have been analyzed and selected, an initial draft SWMP will be developed and presented for more public consultation. Important considerations include adequate engagement with CVRD stakeholders which range from the public, the private sectors and through to First Nations. An updated 2018 SWMP will be crafted based on the outcomes of the previous deliverables, including a consultation summary.

1.2 Guiding Principles

The Ministry released a planning guide entitled, “A Guide to Solid Waste Management Planning” (Guide) in 2016. This Guide will help direct the CVRD’s solid waste management planning process.

In this Guide, the Ministry identified eight Guiding Principles, presented in Figure 1-1. The Ministry states that the SWMP should be updated based on locally-relevant Guiding Principles, which are clearly stated in the Plan. It is expected that the CVRD’s Plan Update will use a similar set of Guiding Principles to those presented in Figure 1-1. These principles will be discussed with the PAC and will be highlighted as a topic for the public consultation process.



Figure 1-1: Provincial Guiding Principles

1.3 Waste Prevention Hierarchy

The waste prevention hierarchy (Figure 1-2) is a useful tool when evaluating options to improve a solid waste management system and is foundational for the CVRD's SWMP Update.



Figure 1-2: Waste Prevention Hierarchy

Source: (BC Ministry of Environment and Climate Change Strategy, n.d.)

Where practical and feasible, it is preferable to undertake actions higher on the hierarchy scale (i.e. reduce and reuse) than to explore other waste management strategies (recycle, then recover, then residuals management). The latter options should be examined once the earlier options have been exhausted.

The benefits to this approach are as follows:

- **Actions taken at higher levels in the waste prevention hierarchy can eliminate or reduce the environmental management costs of actions at lower levels.** For example, waste prevention programs can reduce the amount of waste that would be handled thereby reducing waste management costs.
- **The waste prevention hierarchy can also reduce the environmental impacts of product manufacturing and distribution.** For example, reuse (and, to a lesser degree, recycling) will reduce the demand for and thus environmental impact of extracting and processing virgin resources, while the use of recycled materials can reduce the energy cost for virgin inputs needed to manufacture new products.

In this technical memorandum, options are listed in the same order as the waste prevention hierarchy.

1.4 Goals

A SWMP should clearly outline goals for the duration of the plan. Although the plan outlines strategies for the next ten years, it is important to take into considerations overarching initiatives that may span over twenty or thirty years. The Ministry has defined the following goals for British Columbia to achieve by 2020:

- 75% of BC's Population covered by Organic Waste Disposal Restrictions;
- 75% Recovery of Materials Covered by Extended Producer Responsibility Programs (EPR); and
- Provincial Disposal Rate of 350 kg per capita per year.

With a disposal rate of 358 kg per capita, the CVRD is at the forefront of meeting the Ministry's Provincial goals. EPR programs are active in the CVRD and it needs to be determined whether 75% of EPR materials are being recovered. Businesses and institutions in the CVRD are covered by an organic waste disposal restriction and most residents in the CVRD are serviced with curbside collection programs for organic materials, however, there is no residential organic waste disposal restriction. Thus, this Plan will need to consider whether more ambitious goals should be pursued. Suggested goals for this plan update include:

- Adopt "Zero Waste" as a goal for the plan (see Section 1.4.1);
- Target a Regional Disposal Rate of 180 to 300 kg per capita per year by 2030; and/or
- Target that 90% all residents and businesses have minimum service levels (e.g., recycling and organics collection) by 2025.

1.4.1 Zero Waste

"Zero Waste" is a goal that several BC regional districts have adopted, including the Regional District of Nanaimo (RDN), Metro Vancouver, and the Regional District of Kootenay Boundary.

Zero Waste is a visionary goal intended to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste means moving towards a circular economy, wherein 'waste' is viewed as a resource, and maximum value is extracted from all resources before they are eventually recovered or regenerated¹.

A Zero Waste goal suggests a move towards the systematic redesign and management of products and processes to avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. The ultimate realization of Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.²

¹WRAP UK, <http://www.wrap.org.uk/about-us/about/wrap-and-circular-economy>

² Zero Waste International Alliance, <http://zwia.org/standards/zw-definition/>

2.0 AREAS FOR IMPROVEMENT

While the CVRD is a leader in waste management, there are several areas where improvements can occur. Many of these were identified during a 2017 waste composition study.

2.1 Waste Disposal by Sector

The Ministry established waste disposal reporting as an annual requirement for regional districts and set a provincial target of 350 kilograms (kg) per capita per year to be achieved by 2020.

While the CVRD is one of the highest performing regional districts in the Province and is on track to achieve the target disposal rate of 350 kg per capita by 2020, there are opportunities to increase waste diversion in the region even further. Furthermore, the 350 kg per capita disposal rate is a target for 2020, and the CVRD's Plan Update should be mindful that strategies should extend beyond 2028.

Waste management programs are often developed for specific sector(s); thus, it is useful to analyze the materials in the waste stream according to which sector it originated from and the collection approach for those materials. The by-sector disposal tonnage information for the CVRD is presented in Table 2-1.

Table 2-1: Quantities of CVRD Waste by Sector

Sector	Quantity of Disposed Materials (tonnes)	Percent of Total Waste
Single Family (municipalities)	3,010	10%
Single Family (Electoral Areas)	2,709	9%
Multi-Family	2,408	8%
Industrial, Commercial, and Institutional	12,341	41%
Drop-off	4,816	16%
Construction and Demolition	4,816	16%
Total Materials	30,100	100%

2.2 Diversion Potential

This section uses waste composition data to present the amount of potentially divertible material still in the garbage. This section considers two factors when discussing divertability:

- **Material Grouping.** Table 2-2 presents how material types were grouped for the diversion potential analysis. These groupings reflect groups of materials that are managed in a particular way – for example, material that is collected via curbside recycling is grouped together, since these materials could be targeted through improved residential recycling programs, and wasted food is separated from inedible organic materials, since wasted food may be targeted through waste reduction programs, while inedible organic materials may be targeted through organics diversion programs.
- **Sector.** Waste from each sector typically has a distinct composition profile and would be targeted by different programs. Table 2-3 presents the material groupings according to the following sectors:
 - Single Family (Municipalities);
 - Single Family (Electoral Areas);
 - Multi-Family;
 - Industrial, Commercial, and Institutional;
 - Self-hauled Waste; and
 - Construction and Demolition Materials.

Table 2-2: Material Groupings

Category	Included Items (e.g.)
Curbside Recyclable Material (EPR) ¹	Packaging and Printed Paper Materials that are collected from the residential sector (Managed by Recyclable BC)
Containers and Paper Recyclable Materials ¹	Packaging and Printed Paper Materials from the commercial sector
Depot Recyclable Material (EPR)	Deposit Containers, Electronics, Batteries, Used Oil, and Containers, etc.
Wasted Food	Edible or donatable food
Inedible Organic Materials	Inedible food scraps, yard waste, and compostable paper
Recyclable C&D Materials	Cardboard, Drywall, Masonry (concrete/asphalt), Clean Wood, and Metals
Textiles	All textiles
Bulky Objects	Furniture and Mattresses

¹Curbside Recyclable Material and ICI Paper and Printed Packaging are the *same materials*. In the residential sector, these materials are managed by Recycle BC. In the ICI sector, materials are not managed by a product stewardship program.

Table 2-3 presents the potential waste diversion according to material categories and sector. The purpose of this table is to assist in understanding:

- Areas with room for improvement which could be targeted by programs outlined in the SWMP; and
- The effect that waste reduction and diversion programs could have on the overall waste stream, including the effect that they could have on diversion and disposal rates.

Table 2-3: Potential Waste Diversion

				Current CVRD Disposal = 358 kg/capita Provincial Goal = 350 kg/capita CVRD Goal = 250 kg/capita by 2025 (to be confirmed)			
Sector	Contribution to Landfill by Sector (percent and tonnes) ²	Material Type	Material Contribution to Landfill (tonnes) ¹	Target Disposal Rate (kg/capita)			
				325	300	250	150
				16% of divertable materials is removed from the current waste stream	28% of divertable materials is removed from the current waste stream	50% of divertable materials is removed from the current waste stream	96% of divertable materials is removed from the current waste stream
Single-Family (Municipalities)	10% (3,010)	Curbside Recyclable Material	311	50	87	155	298
		Depot Recyclable Material (EPR)	236	38	66	118	227
		Wasted Food	373	60	104	187	358
		Inedible Organic Materials	536	86	150	268	514
		Building Materials	82	13	23	41	79
		Textiles	236	38	66	118	226
		Bulky Objects	5	1	1	3	5
Single-Family (Electoral Areas)	9% (2,709)	Curbside Recyclable Material	214	34	60	107	206
		Depot Recyclable Material (EPR)	180	29	50	90	173
		Wasted Food	524	84	147	262	503
		Inedible Organic Materials	640	102	179	320	615
		Building Materials	113	18	32	57	109
		Textiles	183	29	51	91	176
		Bulky Objects	0	0	0	0	0
Multi-Family	8% (2,408)	Curbside Recyclable Material	358	57	100	179	344
		Depot Recyclable Material (EPR)	234	37	65	117	224
		Wasted Food	414	66	116	207	397
		Inedible Organic Materials	533	85	149	266	512
		Building Materials	38	6	11	19	37
		Textiles	125	20	35	63	120
		Bulky Objects	0	0	0	0	0
Industrial, Commercial, Institutional	41% (12,341)	Recycling Materials - Containers and Paper	1,572	252	440	786	1,509
		Depot Recyclable Material (EPR)	685	110	192	342	657
		Wasted Food	4,251	680	1,190	2,126	4,081
		Inedible Organic Materials	2,224	356	623	1,112	2,135
		Building Materials	315	50	88	157	302
		Textiles	549	88	154	275	527
		Bulky Objects	50	8	14	25	48
Self-hauled Waste	16% (4,816)	Containers and Mixed Paper Recyclables	246	39	69	123	236
		Depot Recyclables	377	60	106	188	362
		Wasted Food	99	16	28	50	95
		Inedible Organic Materials	141	23	39	70	135
		Building Materials	924	148	259	462	887
		Textiles	369	59	103	184	354
		Bulky Objects	622	100	174	311	597
Construction and Demolition Materials	16% (4,816)	Containers and Mixed Paper Recyclables	42	7	12	21	40
		Depot Recyclables	109	17	31	55	105
		Wasted Food	0	0	0	0	0
		Inedible Organic Materials	55	9	15	27	53
		Building Materials	42	7	12	21	40
		Textiles	55	9	15	27	53
		Bulky Objects	159	25	44	79	152
Disposal Reduction (tonnes) from 30,100				2,915	5,102	9,111	17,492
Resulting Per Capita Disposal Rate (kg/capita) from 358 kg/capita				325	300	250	150

¹Red cells indicate a large diversion potential (greater than 500 tonnes); orange cells indicate a medium diversion potential (200 to 500 tonnes)

3.0 OPTIONS FOR CONSIDERATION

Options presented below take into consideration the existing solid waste management system and are presented in order of the waste prevention hierarchy.

3.1 Reduce, Reuse, and Recycle

This SWMP review process has identified issues and associated program and policy options available to reduce the current CVRD 358 kilogram per capital disposal rate. The issues and options are summarized below.

3.1.1 Option 1: Reduce Wasted Food from Residential and Industrial, Commercial, and Institutional (ICI) Sectors

Issues:

- Approximately 1,300 tonnes of edible and donatable food is being wasted by the residential sectors (single family and multi-family).
- Approximately 4,700 tonnes of edible food food is being wasted by the ICI sector.

These numbers reflect the food currently being landfilled. Since municipalities in the CVRD have mature, well-established food scraps collection programs, thus, it is likely that edible or donatable food is also recycled in municipal curbside organics programs. Therefore, the amount of edible and donatable food wasted overall is at least 6,700 tonnes. The production of wasted food is estimated to release 1,600 kg of CO₂ per tonne of wasted food.

A. Promote Residential Food Waste Reduction

Food waste reduction and rescue has become paramount in recent years. The United Nations Food and Agriculture Organization (FAO) estimate that a third of food produced for human consumption is lost or wasted globally, amounting to 1.3 billion tonnes per year. In British Columbia, the Ministry developed food waste reduction tools³ for residential and commercial sectors including a *Food Waste Reduction Toolkit* tailored to municipalities.

The CVRD could consider adopting a well-established residential food waste prevention campaign such as “Love Food Hate Waste”. This program was designed by Waste and Resources Action Programme (WRAP – an UK organization) and is being utilized by several Canadian municipalities. The National Zero Waste Council adapted the “Love Food Hate Waste” program for Canadian municipalities and has resources available to share with participating jurisdictions⁴. The national launch of “Love Food Hate Waste” is planned for May 2018. It is designed to raise awareness to reduce the amount of wasted food by partnering with business and government to design and implement campaigns and tools to actively promote behaviour change. CVRD could consider participating in Love Food Hate Waste as a local implementing partner.

³ BC Ministry of Environment and Climate Change Strategy, 2017. Food Waste Reduction Tools & Resources. <http://www2.gov.bc.ca/gov/content/environment/waste-management/recycling/organics/tools-resources>

⁴ Metro Vancouver, 2017. Love Food Hate Waste Canada. <http://www.lovefoodhatewaste.ca>

B. Build Local Food Rescue Capacity for the ICI Sector

The CVRD could move towards improved food rescue capacity through the following actions:

- Convening with stakeholders who may have a surplus or shortage of food (e.g. large food producers and food banks);
- Creating a database of stakeholders who may have a surplus or shortage of food;
- Advocating to provincial and federal governments for a tax incentive to encourage businesses to donate surplus food;
- Creating toolkits and platforms that allow businesses and residents to learn how surplus food can be donated and utilized;
- Collaborating with Island Health (Health Authority) to define safe food donation practices; and
- Collaborating with local non-profit organizations dedicated to food rescue.

3.1.2 Option 2: Explore Reduction and Reuse Opportunities

Issues:

- There are opportunities to enhance the CVRD's programs at the top of the waste prevention hierarchy (reduction and reuse) to reduce waste, associated environmental impacts and financial implications.

A. Enhance and Improve Local Reuse Opportunities

Free stores are located at all CVRD Recycling Centres, where residents pay standard tipping fees to drop off items but may take items for free. There are also local reuse opportunities through online platforms such as UsedCowichan and Kijiji.

Other platforms for reuse could also be explored, such as repair cafes, tool libraries, or building supply reclamation. The CVRD could support these programs through:

- Collaborating with municipalities on zoning for these types of spaces and/or businesses to reduce barriers for entrepreneurs and residents to set up these types of organizations;
- Providing grants for organizations to implement these initiatives; and
- Convening with stakeholders working in this space to identify opportunities for expansion.

B. Consider Mechanisms to Ban Single-Use Plastic Bags or Other Single-Use Items

In January 2018, the City of Victoria adopted a new Checkout Bag Regulation Bylaw, wherein businesses are not allowed to sell or provide customers with single-use plastic bags. Similarly, the City of Vancouver is developing a Single-Use Item Reduction Strategy that explores waste reduction approaches for disposable cups, bags, and takeout containers.

The CVRD could explore similar mechanisms, adopt policies or develop mandates to ban or reduce the use of Single-Use items.

3.1.3 Option 3: Improve Multi-Family Residential and ICI Recycling

Issues:

- “Blue box” materials make up 13% of the ICI disposal stream and 15% of the multi-family disposal stream (compared to 9% in the single-family sector);
- Compostable organic materials make up 52% of the ICI disposal stream and 39% of the multi-family stream (compared to 23% from the single-family sector that have garbage, recycling, and organics collection);
- The multi-family sector annually disposes approximately 350 tonnes of “blue box” material and 950 tonnes of organic materials;
- The ICI sector annually disposed of 1,600 tonnes of “blue box” material and 6,500 tonnes of organic materials; and
- Nearly one-third of the waste disposed is recyclable or compostable material from the multi-family and ICI sectors.

A. Mandate Multi-Family Source Separation Requirements

Adopt policies and update existing bylaws that require waste haulers to service multi-family buildings with recycling and organics collection. These types of source separation requirements exist in almost all municipalities in Metro Vancouver. As a part of this option, enforcement measures may be considered, such as waste audits of generators, bin checks, cameras on collection vehicles, and surcharges for not having all collection services in place.

B. Mandate ICI Source Separation Requirements

Adopt policies and update existing bylaws that require haulers to service ICI customers with recycling and organics collection. As a part of this option, enforcement measures may be considered, such as waste audits of generators, bin checks, cameras on collection vehicles, and surcharges for not having all collection services in place. Also as part of this option, the materials for source separation should be discussed.

C. Provide for Collection Services to Multi-Family and ICI Sectors

Explore opportunities to ensure equitable services to all sectors, such as bylaw changes to require services for all multi-family and/or ICI sectors.

D. Enforcement of Material Disposal Bans

The CVRD has material disposal bans in place for recyclable and commercial organic materials. Stricter enforcement of these bans can improve adherence to bylaws. In communities that enforce material disposal bans and apply surcharges for non-compliance, haulers would be fined for loads containing a certain amount of the banned materials. These enforcement actions can be motivated haulers to work with their customers to provide adequate service levels and public education. Customers who resist adopting the new services would be charged a higher rate that would account for financial penalties.

3.1.4 Option 4: Provide Equal Access to Publicly-Funded Infrastructure

Issues:

- Most residents in the South End of the regional district (over 30,000 residents in Electoral Areas A, B, and C, and D) are not within a 15-minute drive of a publicly funded Recycling Centre or solid waste facility.
- Residents in these Areas and in Electoral Area H are also not provided with curbside garbage collection by the CVRD.
- Over 33,000 Residents in the CVRD (mostly living in Electoral Areas) do not have public sector organics collection. Residents in areas with *no* organics collection, either public or private, have 13% more organics in the garbage than in areas with organics collection.

A. Develop a Public Recycling Centre in the South End

The 2006 SWMP included a plan to develop a public drop off depot in the south end of the CVRD, to service Electoral Areas A, B, and C. This initiative is on-hold because the siting efforts were unsuccessful in 2011. The CVRD has an agreement with Fisher Road Recycling in Cobble Hill that allows south end area residents to drop off recyclables such as packaging and printed paper for free, and yard waste at Central Landscape Supplies for free.

An analysis could be completed to determine whether a public south-end facility could be built or purchased. This analysis should include community consultations to determine:

- The desire for a public drop-off facility;
- Understanding of community's preference for a public south-end depot versus expanded curbside collection; and
- The willingness to fund a public drop-off facility.

B. Expand Agreements between CVRD and Private Facilities in the South End

As noted above, the CVRD currently has agreements with private facilities to service the south end of the regional district so that residents may drop off yard waste and recyclable materials that are managed by Recycle BC (Packaging and Printed Paper) for free. However, for other items, residents must pay a \$5 minimum drop off fee. The CVRD could explore expanding this agreement so that residents in the south end have access to the same service levels as residents who use CVRD Recycling Centres and do not pay a minimum drop off fee for recyclables.

C. Implement Universal Garbage Collection in all Electoral Areas

An alternative way to provide garbage and recycling services to the south-end may be to implement universal garbage collection. If this option is chosen for further investigation, public consultation will be undertaken to determine whether universal curbside collection is desired in the Electoral Areas that do not currently have these programs.

D. Provide Organics Collection to all Electoral Areas

The 2017 waste composition study showed that households with curbside organics collection have less organics in the garbage, as presented in Table 3-1. The differences in composition is primarily due to increased food waste (and not due to yard waste from larger rural properties).

Table 3-1: Correlation of Organics in Garbage to Varying Service Levels

Service Level Description	Areas	Proportion of Organics in Garbage
Mandatory organics collection	All municipalities	23%
Optional organics collection	Electoral Areas A-C	30%
No organics collection	Electoral Areas D-I	36%

3.1.5 Option 5: Improve Organics Processing

Issues:

- Organics processing and diversion is one of the main reasons for high diversion rates in the CVRD.
- There are several organic processing facilities in the CVRD and many are generating unacceptable odour that are impacting residents and businesses.
- Amount of organics being continues to grow as more organics from outside the region are being brought into facilities in the CVRD.
- Facilities that process more organics than they were designed to receive are susceptible to odour incidents. Odour complaints have been an issue in recent years in several nearby regional districts such as Metro Vancouver, Capital Regional District, and Regional District of Nanaimo. Unacceptable odour incidents have led to closure of several organic processing facilities in the last five years using various instruments.
- Organics processing facilities are regulated under the Provincial Organic Matter Recycling Regulation (OMRR) and the CVRD licences solid waste management facilities such as composting facilities.

A. Ensure Use of Best Management Practices for Odour Management

Work with private and public processors to conduct best available control technology (BACT) assessments and explore opportunities to incorporate advanced processes or technologies for organics processing that may reduce odour impacts to the environment.

B. Prohibit Out-of-Region Organics Processing in CVRD

Limiting the quantity of organics being processed in the region should reduce the potential impact from odours. The CVRD could consider restricting local processing capacity so that only materials from the CVRD would be allowed to be processed. There are currently no regulations to prevent organic materials from crossing regional district borders anywhere in British Columbia, and nearby regional districts have been unsuccessful in implementing this type of material flow regulations, so this would be a difficult undertaking.

C. Standardize Design Criteria and Limits to Protect Environment and Public

Develop design criteria and emission/odour limits to ensure odours are not impacting the environment and public. Since there are standards that may apply from the BC Ministry of Environment, these standards would be over and above the provincial requirements.

D. Build an Organics Processing Facility

Private organics processing facilities may have outgrown their premises or the community has grown around them. To ensure there is adequate organics processing capacity in the regional district, it might be reasonable for the public sector to help relocate or build an organics processing facility in an area that is large enough and far away

enough from potential receptors. An organics processing facility could also be built through a public-private partnership.

E. Purchase a Wood Chipper for Curbside Services

In some rural areas in the CVRD, residents burn yard waste, which can lead to air quality issues. The CVRD may wish to purchase a wood chipper which could be provided as an occasional, seasonal curbside service in rural areas. In this scenario, participating residents would receive free wood chips (i.e. mulch), a useful material, in exchange for their yard waste.

F. Increase Use of Backyard Composters

The CVRD previously held an annual sale of subsidized backyard composters; however, sales began to dwindle in 2012 with the implementation of curbside organics collection in member municipalities. Eventually, sales were discontinued although backyard composters are still available for purchase at several local hardware stores. The CVRD may consider holding a similar sale in the future, or implementing a campaign to educate the public about backyard composting.

3.1.6 Option 6: Investigate Processing and Transfer Capacity for Recyclables

Issues:

- Most recyclable materials in the region were previously hauled to the Vancouver Island Recycling Centre which was located in the CVRD. This facility has since closed, and materials are hauled out of region to material recovery facilities (MRFs) in either the Capital Regional District (Victoria) or the Regional District of Nanaimo (Nanaimo).
- There are no facilities in the CVRD that accept comingled ICI recyclable materials and this material is typically hauled out-of-region or not collected at all because there is no local drop off location.

A. Investigate Feasibility of a Material Recycling Facility (MRF)

Determine whether it is feasible and necessary to build a MRF in the CVRD.

B. Determine Feasibility of Creating ICI Transfer Capacity for Recyclables

Recyclables from the residential sector are taken to the Bings Creek Transfer Station. The CVRD could investigate options for the most feasible or cost-effective approach for managing ICI recyclables. This may include a feasibility study to assess the logistics and costs to accept comingled ICI recyclable materials at Bings Creek Transfer Station or at a private sector facility.

3.1.7 Option 7: Improve Management of Construction and Demolition (C&D) Materials

Issues:

- There are no programs that mandate recycling of C&D materials in the CVRD.
- There is limited disposal capacity for hazardous C&D materials (asbestos, gypsum wallboard) and the material is costly to manage and properly dispose.

A. Monitor C&D Disposal and Recycling Activities in the Region

C&D waste typically represents 16% of the waste stream in the CVRD, and recyclability of this material is typically in the order of 70% to 80%. The CVRD should conduct a C&D waste system analysis to determine how residents and businesses are managing C&D waste, where it is taken to and available capacity for managing this waste stream. This study can also assess the current recycling/waste diversion activities in the region and whether there is a need to develop mechanisms to further divert C&D materials from disposal.

B. Mandate Diversion Targets for C&D Materials

When there are suitable options for diverting C&D materials, some municipalities impose minimum diversion targets that would become a condition/requirement for issuance of demolition and building permits.

C. Mandate that all C&D Materials be taken to Permitted Facilities

As part of the building and demolition permit process, a condition of those permits can include taking C&D materials to authorized C&D facilities that would focus on recycling or diverting C&D materials from disposal.

D. C&D Waste Management Strategy

As part of the SMWP update, the CVRD could undertake a planning process to develop a C&D waste management strategy for the region. This would take into consideration the results from the C&D waste system analysis, consult with key stakeholders (i.e. construction industry, C&D waste processor, waste haulers, municipalities, etc.) and develop a strategy that follows the goals and principles of the SWMP.

E. Reduce Barriers to Disposing Hazardous Materials (asbestos, gypsum wallboard)

Asbestos and gypsum wallboard may currently be disposed at Coast Environmental (Duncan and Chemainus locations). However, it is expensive for residents to dispose of these materials. The CVRD may consider reducing barriers to legally disposing of these materials by providing a disposal subsidy.

3.1.8 Option 8: Advocate for Expansion of EPR Programs

Issues:

- The CVRD currently accepts mattresses and bulky furniture at Bings Creek for recycling, however, recycling of these items is currently funded through tipping fees because there are no EPR programs for these items.
- 544 tonnes of textiles are disposed by the residential sector and 549 tonnes are disposed by the ICI sector. These materials are recyclable but are not managed by an EPR Program.

A. Advocate to the Ministry to Expand EPR Programs to these Materials

The Canadian Council for Ministers of the Environment (CCME) continues to provide guideline updates for Canada-wide implementation of EPR programs. Products not yet in the BC Recycling Regulation that are recommended for Canada-wide EPR include carpet, textiles, and furniture. CVRD can continue to stay abreast of industry trends through conferences and annual updates as provided by the CCME and the BC Product Stewardship Council (BCPSC). There is also an opportunity to advocate for new programs through direct correspondence with the Ministry or through associations of which CVRD is a member (e.g. British Columbia Product Stewardship Council).

The CVRD currently accepts mattresses and bulky objects at Bings Creek and has a contract with a private facility to process these materials. More than 12,000 mattresses have been collected since the program's implementation in 2012. The CVRD funds this recycling by charging high tipping fees for these materials. The CVRD's management of materials such as mattresses and bulky furniture presents an opportunity to justify the expansion of EPR to these materials.

3.2 Recovery and Residuals Management

3.2.1 Option 1: Explore Options for Local Disposal

Issues:

- The CVRD has one of the highest tipping fees in British Columbia.
- The solid waste is exported to the Roosevelt Regional Landfill in Washington State, and the CVRD is responsible for transportation costs and the USD exchange rates.

Shipping waste across the Canada-USA border has many risks including fluctuation of the exchange rate, challenges with marine traffic and potential border restrictions. The CVRD maintains a contingency disposal agreement with the Regional District of Nanaimo in the event exporting waste to the designated disposal facility is disrupted. It is recommended that the options for local disposal presented in Table 3-2 are explored. These options are not an exhaustive list. To ensure the efficiency of the disposal system, the CVRD should continue to explore the feasibility of alternative disposal mechanisms as opportunities arise.

Table 3-2: Options for Local Disposal

Option	Description
Status Quo	Currently, waste is placed in shipping containers, ferried to the mainland, transported by rail to Southeastern Washington State, and taken to the Roosevelt Regional Landfill for disposal. The empty shipping containers are brought back to the CVRD to be filled with waste again. This disposal program costs approximately \$130/tonne.
Disposal at Comox Valley Regional Landfill	A new landfill was recently opened in Comox Valley. Preliminary conversations have indicated that the Comox Valley Regional District may be open to receiving waste from the Cowichan Valley Regional District. The feasibility of disposal at the Comox Valley Landfill should be explored.
Waste to Energy (Public Facility)	Two recent studies reviewed the feasibility of a Waste to Energy (WTE) facility for southern Vancouver Island. Both studies determined that viable technology exists but is not economically feasible. However, the 2018 SWMP could revisit the creation of WTE infrastructure in the CVRD if it is desired by the PAC and public.
Waste to Energy (Private Facility)	It is possible that a new private WTE facility may be built within the Cowichan Valley. The feasibility of disposal at this potential WTE facility should be explored.
New CVRD Landfill Development	The CVRD tried to site a landfill in the mid-1990s. An appropriate site was not found; thus, waste has since been exported out of region. If it is desired by the PAC and the public, an initiative for the 2018 SWMP could be to site and build a new landfill.

3.2.2 Option 2: Reduce Illegal Dumping

Issues:

- Illegal dumping of materials occurs throughout the CVRD.

A campaign was conducted in 2016 to reduce illegal dumping in the Hillcrest Road area. Additionally, a “Free Tipping” policy was implemented in the early 2000s which provides financial incentives to non-profit organizations for cleaning up public lands or for appropriately disposing of waste dumped on their property.

However, illegal dumping continues to be a problem. The CVRD may wish to analyze the costs and ubiquity of illegal dumping to determine whether changes need to be made to the current system.

3.2.3 Option 3: Improve Collection of Materials which are Difficult to Dispose

Issues:

- The CVRD has no options for residents to safely dispose of household hazardous materials which are not managed by an EPR program.
- The CVRD does not have subsidized collection for bulky items, such as furniture and mattresses, which may contribute to illegal dumping.

A. Accept Household Hazardous Materials at CVRD Recycling Facilities

The CVRD could begin to accept household hazardous materials (which are not managed by an EPR program) at CVRD Recycling Facilities. This could be implemented on a periodic (annual or seasonal) or year-round basis. The CVRD may also wish to create agreements (or expand existing agreements) with private facilities to subsidize them to accept these materials.

B. Implement Occasional Curbside Collection for Bulky Items

The CVRD could implement a curbside collection system for bulky items, wherein residents could call the CVRD up to given number of times (usually two or three) per year to have their bulky items collected. If this option is chosen for further review, it would need to be determined whether this would be in place throughout the CVRD or in Electoral Areas only. If this service was to be offered in municipalities, it would need to be determined whether this service would be offered by municipalities or by the CVRD.

3.2.4 Option 4: Monitor Historic Disposal Sites

Issues:

- The CVRD has a number of closed disposal sites that require ongoing monitoring and attention: Koksilah Sanitary Landfill, Koksilah Road Incinerator Ash Landfill, Peerless Road Incinerator Ash Landfill, and Meade Creek Incinerator Ash Landfill (ash landfill closure is in progress at the time of writing).

The CVRD needs to continue monitoring and assessing the state of these historic disposal sites and implementing measures that minimize potential impacts to the environment. These sites should have annual resources to monitor and address potential concerns. Monitoring requirements should continue unless it can be demonstrated that these sites are no longer an environmental concern.

3.3 Operational Improvement

3.3.1 Option 1: Bings Creek Transfer Station 10-Year Plan

Issues:

- Bings Creek receives most of the waste in the regional district. This facility accepts many waste streams and the future function and capacity of this facility needs to be determined.
- Bings Creek does not receive ICI sector recyclables. Although residential recyclables are received at the transfer station, there is very little room to receive any more material. The transfer station building received both residential recycling and waste destined for disposal from residential and commercial sources.
- Bings Creek is not equipped with compactors or balers. Purchasing this equipment may lead to operational efficiencies.

The role of the Bings Creek Transfer Station needs to be determined. This should take into consideration the type and amount of material it would be receiving, any processing that could occur on site and a condition assessment of the structures. The CVRD plans to begin a transfer station operations analysis during the solid waste management planning process to determine the feasibility of capital and operational improvements.

3.3.2 Option 2: Create an Asset Management Plan

Issues:

- The CVRD owns a number of mobile (trucks/equipment) and stationary (buildings) assets. Mobile assets have varied life spans and stationary structures typically last longer than mobile assets.
- It is prudent to understand the assets that the CVRD holds and the operational and financial considerations to manage the solid waste system in a sustainable manner.

In 2016, the CVRD adopted an Asset Management Policy and is committed to applying recognized holistic Asset Management practices in its strategic planning, operations and financial management systems to deliver sustainable services to its communities and direct customers.

As part of the SWMP, an asset management planning process could be conducted to document the future needs of the solid waste management system, how those assets are operated and managed, lifespan of those assets, cost of assets and financial plan to pay for the assets (replacement or repair) and where the revenues would come from.

3.3.3 Option 3: Emergency Management Plan

Issues:

- The CVRD currently does not have an emergency/disaster management plan for solid waste in the event of a natural disaster.

Several Canadian municipalities, such as Fort McMurray, interior BC, and Calgary, were affected by fires or floods. These types of disasters create a chaotic situation and require a management plan to deal with the large amounts or different types of waste that will require disposal or staging. Consideration should be given to developing an Emergency Management Plan for public waste management facilities. The CVRD is susceptible to fires, floods and earthquakes.

3.4 Education and Behaviour Change Considerations

Increased education is not presented as a separate option in this document. Many of the options outlined herein would require CVRD residents to change their behaviour. To be successful, these options would require education programs to be expanded.

In addition to continuing to promote waste reduction and diversion programs through vivid print and electronic communications tools, social media (e.g., Facebook, Twitter, YouTube), and hands on technical assistance, other behaviour change tools can be integrated into education efforts. The behaviour change tactics outlined within community-based social marketing (CBSM) can provide a framework for how to most effectively target a specific behaviour. Derived from social marketing by Doug McKenzie-Mohr, an environmental psychologist, CBSM offers a several behaviour change tools that can be incorporated into existing and future education initiatives. Examples of CBSM behaviour based tools include:

- **Commitment** – By agreeing to a small request, people have subsequently been found to be far more likely to agree to a larger request.
- **Prompts** – Prompts can also be used to encourage people to engage in positive behaviour. By providing visual or auditory aids, people are reminded to perform a particular action. Prompts often take the form of a sticker or tag posted in close proximity to the action.
- **Norms** – Norms guide how we behave and are largely influenced by the behaviour of those around us. If members of our community, especially our immediate networks, are living sustainably, we are more likely to do the same.
- **Social Diffusion** – New behaviours are frequently adopted because friends, colleagues, or competitors have changed certain behaviours. To encourage social diffusion, make commitments to new behaviours public and visible (such as adding a sticker for another environmental behaviour to the side of a collection container) and/or recruit well known and respected opinion leaders in the community to promote a specific behaviour.
- **Communication** – The more relevant messages are to a group, the more likely it is to captivate someone's attention.
- **Incentives/Disincentives** – Closely pairing an incentive, or reward, to specific positive behaviour can have a substantial impact on encouraging sustainable activities. This strategy is particularly useful when motivation to engage in action is low or people are not doing the activity as effectively as they could.
- **Convenience** – Consider the external barriers related to a project, how they can be overcome, and what resources are needed to successfully address them.

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We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
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Attachments: Tetra Tech's Limitations on the Use of this Document

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GEOENVIRONMENTAL

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Technical Memorandum 3

Financial and Technical Analysis

To: Tauseef Waraich
Harmony Huffman

Date: October 17, 2018

c:

Memo No.: 3

From: Melissa Nielsen
Tamara Shulman
Wilbert Yang

File: 704-SWM.PLAN03006-01

Subject: Tech Memo 3 – Financial Assessment and Strategies Selection (Preliminary for Review)

1.0 INTRODUCTION

The Cowichan Valley Regional District (CVRD) retained Tetra Tech Canada Inc. (Tetra Tech) to support the review and update of the CVRD's Solid Waste Management Plan (SWMP). The 2018 Draft SWMP Update will review existing solid waste management policies and programs; identify and evaluate strategies for reduction and diversion, residual management, and financing; and set the regional district's waste management principles, targets and strategies for the next ten years. A summary of the project phases that encompasses solid waste management planning process is included in Table 1-1.

Table 1-1: Project Deliverables

Phase		Deliverable
1	Initiate the Planning Process	▪ Technical Memorandum (Tech Memo) 1 - Current Solid Waste Management System Overview
2	Set the Plan Direction	▪ Consultation Plan ▪ Tech Memo 2 - Options: 3 R's and Residual Management
3	Evaluate Strategies	▪ Tech Memo 3 – Financial Assessment and Strategies Selection
4	Prepare and Adopt the Plan	▪ Draft Solid Waste Management Plan ▪ Consultation Summary Report
5	Plan to Implement, Monitor, and Report	▪ 2018 Solid Waste Management Plan

This document represents Phase 3 (Tech Memo 3) and provides a financial analysis of the strategies selected for the 2018 Draft SWMP Update. Tech Memo 1 included an overview of the Current Solid Waste Management System that was presented at the Plan Advisory Committee (PAC) meeting on March 29, 2018. Tech Memo 2 was presented to the PAC on May 10, 2018 and identified options for consideration for the SWMP Update and discussed the Guiding Principles that would ultimately be used as the foundation for the SWMP Update.

1.1 Purpose

The purpose of this tech memo is to elaborate on the strategies selected, assess their implications on the solid waste management system, and develop an understanding of the resource requirements. In addition, this tech memo will include refinements to the Guiding Principles for the updated Plan.

Once the strategies have been analyzed and selected, an initial draft SWMP will be developed and presented for more public consultation. Important considerations include adequate engagement with CVRD stakeholders which range from the public, the private sectors and through to First Nations. An updated 2018 SWMP will be crafted based on the outcomes of the previous deliverables, including a consultation summary.

1.2 Guiding Principles

SWMPs should have Guiding Principles to provide an overarching direction for the plan. The PAC reviewed the Ministry's Guiding Principles that were included in the planning guide entitled, "A Guide to Solid Waste Management Planning" (Guide) and recommended modifications that better suits the regional district's priorities and situation. The PAC recommends the following Guiding Principles.

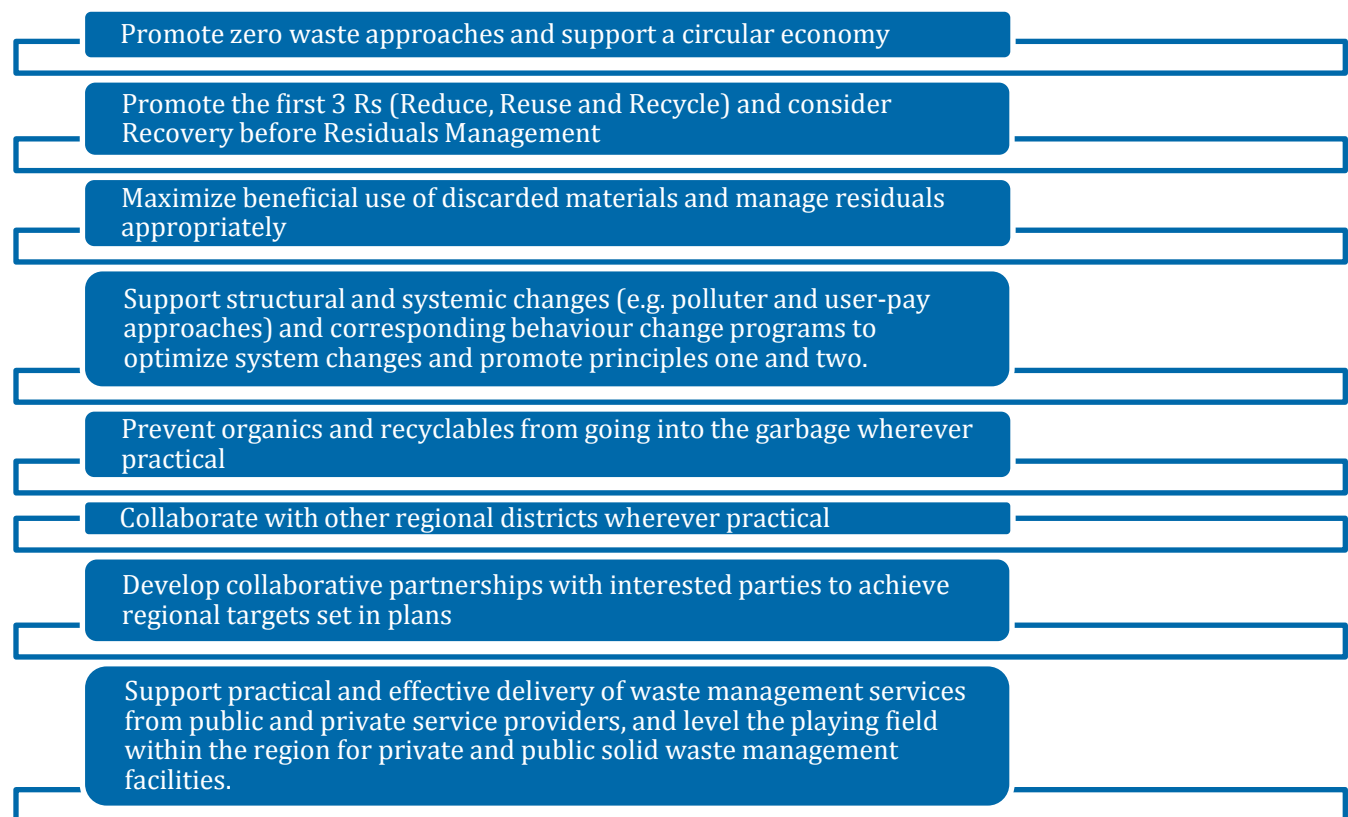


Figure 1-1: Cowichan Valley Regional District Guiding Principles for the 2018 SWMP Update

2.0 SOLID WASTE SYSTEM RECAP AND REFRAME

In terms of disposal and diversion rate, the CVRD is one of the highest performing regional districts in the Province. In 2016, an estimated 30,100 tonnes of waste were disposed from within the region, which amounts to an annual disposal rate of 358 kg per capita. The total amount of recycling (including organic materials) was approximately 44,000 tonnes, which amounts to an annual recycling rate of 525 kg per capita.

2.1 Facilities and Services

The major solid waste management facilities that support the CVRD are summarized in Table 2-1. These facilities are a combination of public and private sector facilities, and offer a variety of services from processing organic materials to drop-off of recyclable, organics and garbage.

Table 2-1: Overview of Major CVRD Facilities

Facility Name	Facility Type	Location(s)	Ownership Model
Bings Creek Recycling Centre & Garbage Drop-Off Depot	Transfer Station and Drop-off Depot	Duncan	Public
Meade Creek Recycling Centre & Garbage Drop-Off Depot	Drop-off Depot	Lake Cowichan	Public
Peerless Road Recycling Centre & Garbage Drop-Off Depot	Drop-off Depot	Ladysmith	Public
Coast Environmental	Transfer Station, Drop-off Depot, Organics Processor	Duncan and Chemainus	Private
Fisher Road Recycling	Transfer Station and Drop-off Depot, Organics Processor	Cobble Hill	Private

Three types of residential waste collection exist in the CVRD: (1) public or publicly-contracted collection at curbside; (2) private collection; and (3) self-haul by residents or small businesses to drop-off depots. Most single-family residents receive a three-stream curbside collection service (garbage, recycling and organics). Many businesses in the commercial sector and most multi-family residents do not receive organics collection service, and many do not receive recycling service.

There is a combination of public and private sector depots throughout the CVRD. The southern Electoral Areas (A, B, and C) are served exclusively by private facilities. The CVRD tried to site a public sector depot in Area B in 2011 but was unsuccessful. In lieu of public service, the CVRD partners with private sector depots to offer free drop-off for packaging and printed paper materials and yard waste for south end residents.

Recyclables are collected in the CVRD and transferred to material recovery facilities (MRFs) in the Capital Regional District (CRD) or the Regional District of Nanaimo (RDN). Bings Creek is the transfer station for residential recyclables collected under the RecycleBC program. A transfer station for industrial, commercial, and institutional (ICI) sector recyclables is lacking in the CVRD.

There are no disposal facilities in the CVRD. Garbage from the CVRD is transported and disposed in a private sector landfill in Roosevelt, Washington in the United States of America.

2.2 Disposal by Sector

In 2016, an estimated 30,100 tonnes of waste were disposed from the regional district. Most materials disposed (~70%) were taken to CVRD facilities. The remainder was taken to private sector facilities. Table 2-2 summarizes the estimated distribution by sector.

Table 2-2: Disposed Material by Sector

Sector	Percent of Total Disposed Materials	Quantity of Disposed Materials (tonnes)
Single-Family	19%	5,719
Multi-Family	8%	2,408
Industrial, Commercial, and Institutional	41%	12,341
Drop-off	16%	4,816
Construction and Demolition	16%	4,816
Total Disposal Rate	100%	30,100

2.3 Waste Composition

The 2017 waste composition study (Figure 2-1) revealed that the largest component of the waste disposed was compostable organics (24.4%), followed by plastics (17.2%), and paper (11.1%).

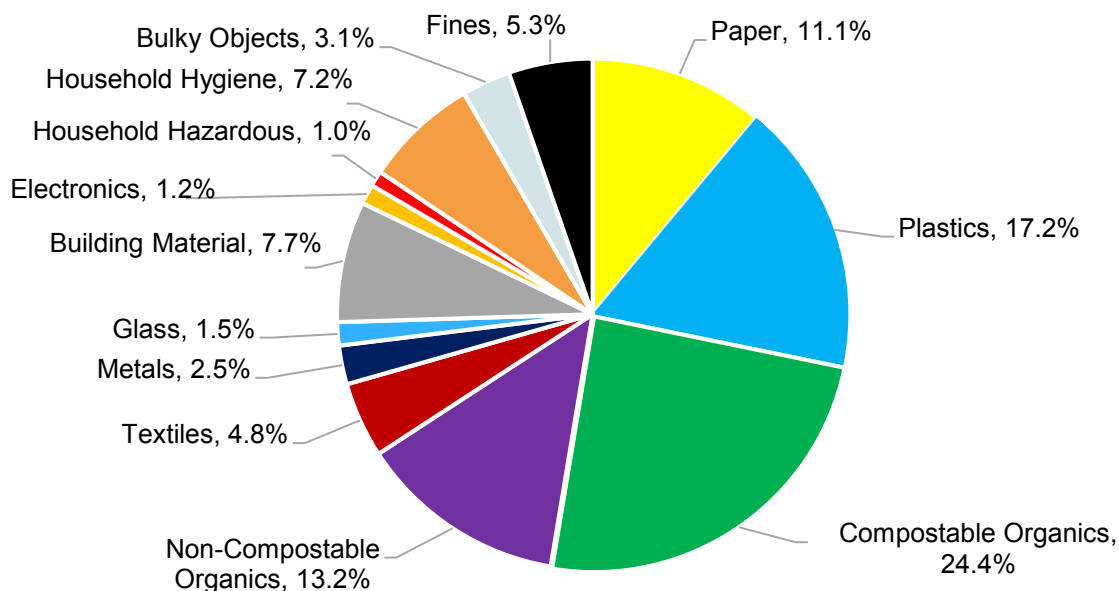


Figure 2-1: Overall Waste Composition – All Sectors

The study also examined the primary waste composition categories by sector (Residential (Single Family [SF] & Multi-Family [MF]), Industrial, Commercial and Institutional [ICI], Drop Off [DO] and Construction & Demolition [C&D]). As shown in Figure 2-2, most of the discarded materials consist of paper, plastic, metal, and organic materials, and much of these materials are recoverable from the waste stream.

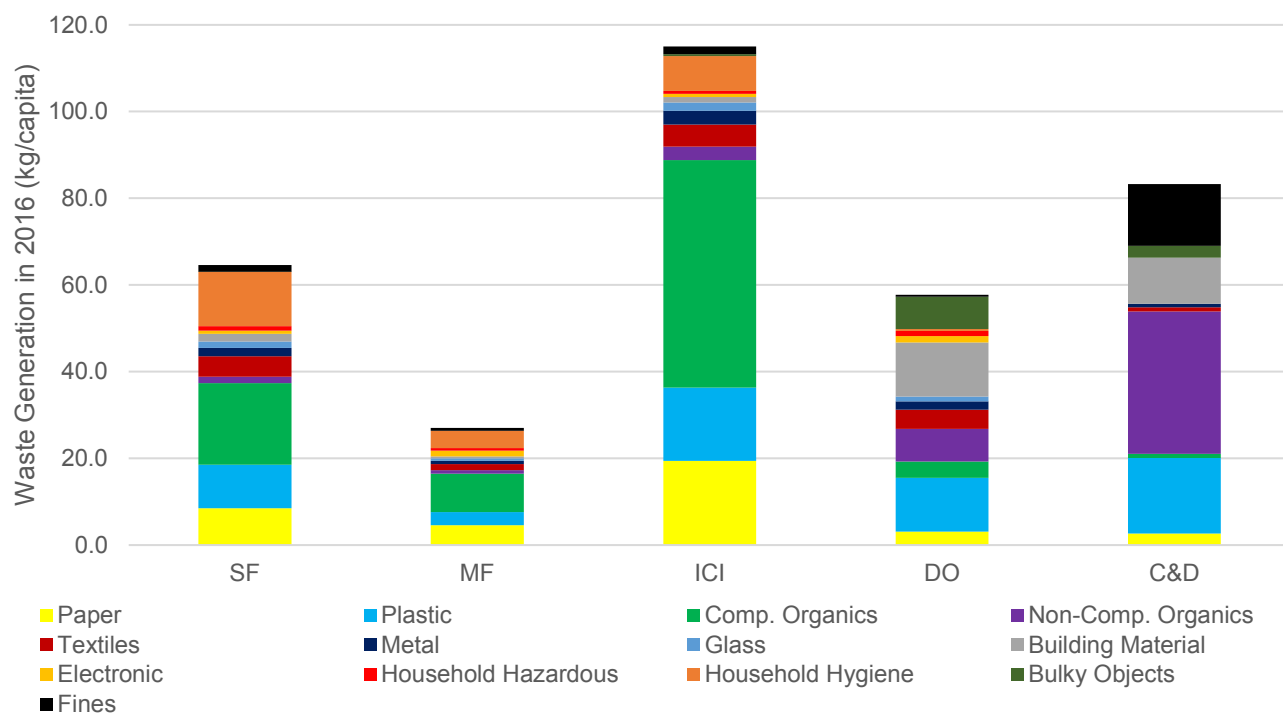


Figure 2-2: Waste Composition and Disposal by Sector

2.4 Diversion Potential

The Ministry established waste disposal reporting as an annual requirement for regional districts and set a provincial target of 350 kilograms (kg) per capita per year or lower to be achieved by 2020. While the CVRD is one of the highest performing regional districts in the Province and is on track to achieve the provincial target by 2020, there are opportunities in certain sectors to increase waste diversion in the region even further. It is also important to take into consideration that the provincial target is for 2020 and the CVRD's Plan Update spans beyond 2028.

This section uses waste composition data to present the amount of potentially divertible material still in the garbage. This section considers two factors when discussing diversion potential:

- **Material Grouping.** Table 2-3 presents how material types were grouped for the diversion potential analysis. These groupings reflect groups of materials that are managed in a particular way – for example, material that is collected via curbside recycling is grouped together, since these materials could be targeted through improved residential recycling programs, and wasted food is separated from inedible organic materials, since wasted food may be targeted through waste reduction programs, while inedible organic materials may be targeted through organics diversion programs.
- **Sector.** Waste from each sector typically has a distinct composition profile and would be targeted by different programs. Table 2-4 presents the material groupings according to the following sectors:
 - Single Family (Municipalities);
 - Single Family (Electoral Areas);
 - Multi-Family;
 - Industrial, Commercial, and Institutional;
 - Self-hauled Waste; and
 - Construction and Demolition Materials.

Table 2-3: Material Groupings

Category	Included Items (e.g.)
Curbside Recyclable Material (EPR) ¹	Packaging and Printed Paper Materials that are collected from the residential sector (Managed by Recyclable BC)
Containers and Paper Recyclable Materials ¹	Packaging and Printed Paper Materials from the commercial sector
Depot Recyclable Material (EPR)	Deposit Containers, Electronics, Batteries, Used Oil, and Containers, etc.
Wasted Food	Edible or donatable food
Inedible Organic Materials	Inedible food scraps, yard waste, and compostable paper
Recyclable C&D Materials	Cardboard, Drywall, Masonry (concrete/asphalt), Clean Wood, and Metals
Textiles	All textiles
Bulky Objects	Furniture and Mattresses

¹Curbside Recyclable Material and ICI Paper and Printed Packaging are the *same materials*. In the residential sector, these materials are managed by Recycle BC. In the ICI sector, materials are not managed by a product stewardship program.

Table 2-4 presents the potential waste diversion according to material categories and sector. The purpose of this table is to assist in understanding:

- Areas with room for improvement which could be targeted by programs outlined in the SWMP; and
- The effect that waste reduction and diversion programs could have on the overall waste stream, including the effect that they could have on diversion and disposal rates.

Table 2-4: Potential Waste Diversion

				Current CVRD Disposal = 358 kg/capita Provincial Goal = 350 kg/capita CVRD Goal = 250 kg/capita by 2025 (to be confirmed)			
Sector	Contribution to Landfill by Sector (percent and tonnes) ²	Material Type	Material Contribution to Landfill (tonnes) ¹	Target Disposal Rate (kg/capita)			
				325	300	250	150
				16% of divertable materials is removed from the current waste stream	28% of divertable materials is removed from the current waste stream	50% of divertable materials is removed from the current waste stream	96% of divertable materials is removed from the current waste stream
Single-Family (Municipalities)	10% (3,010)	Curbside Recyclable Material	311	50	87	155	298
		Depot Recyclable Material (EPR)	236	38	66	118	227
		Wasted Food	373	60	104	187	358
		Inedible Organic Materials	536	86	150	268	514
		Building Materials	82	13	23	41	79
		Textiles	236	38	66	118	226
		Bulky Objects	5	1	1	3	5
Single-Family (Electoral Areas)	9% (2,709)	Curbside Recyclable Material	214	34	60	107	206
		Depot Recyclable Material (EPR)	180	29	50	90	173
		Wasted Food	524	84	147	262	503
		Inedible Organic Materials	640	102	179	320	615
		Building Materials	113	18	32	57	109
		Textiles	183	29	51	91	176
		Bulky Objects	0	0	0	0	0
Multi-Family	8% (2,408)	Curbside Recyclable Material	358	57	100	179	344
		Depot Recyclable Material (EPR)	234	37	65	117	224
		Wasted Food	414	66	116	207	397
		Inedible Organic Materials	533	85	149	266	512
		Building Materials	38	6	11	19	37
		Textiles	125	20	35	63	120
		Bulky Objects	0	0	0	0	0
Industrial, Commercial, Institutional	41% (12,341)	Recycling Materials - Containers and Paper	1,572	252	440	786	1,509
		Depot Recyclable Material (EPR)	685	110	192	342	657
		Wasted Food	4,251	680	1,190	2,126	4,081
		Inedible Organic Materials	2,224	356	623	1,112	2,135
		Building Materials	315	50	88	157	302
		Textiles	549	88	154	275	527
		Bulky Objects	50	8	14	25	48
Self-hauled Waste	16% (4,816)	Containers and Mixed Paper Recyclables	246	39	69	123	236
		Depot Recyclables	377	60	106	188	362
		Wasted Food	99	16	28	50	95
		Inedible Organic Materials	141	23	39	70	135
		Building Materials	924	148	259	462	887
		Textiles	369	59	103	184	354
		Bulky Objects	622	100	174	311	597
Construction and Demolition Materials	16% (4,816)	Containers and Mixed Paper Recyclables	42	7	12	21	40
		Depot Recyclables	109	17	31	55	105
		Wasted Food	0	0	0	0	0
		Inedible Organic Materials	55	9	15	27	53
		Building Materials	42	7	12	21	40
		Textiles	55	9	15	27	53
		Bulky Objects	159	25	44	79	152
Disposal Reduction (tonnes) from 30,100				2,915	5,102	9,111	17,492
Resulting Per Capita Disposal Rate (kg/capita) from 358 kg/capita				325	300	250	150

¹Red cells indicate a large diversion potential (greater than 500 tonnes); orange cells indicate a medium diversion potential (200 to 500 tonnes)

The sectors with the greatest opportunity for additional diversion include the ICI sector, multi-family households and single family homes who do not have organic diversion programs.

2.5 Financials and Staffing

This sub-section summarizes the financial and staffing resources for the CVRD.

2.5.1 Financials

The CVRD Recycling and Waste Management Division operates on an annual budget of approximately \$9.6 million. This is divided between two functions which deal with solid waste management planning and operation of regional Recycling Centres, and curbside collection of garbage and recyclable materials for residents living in Electoral Areas. Table 2-5 summarizes the budgets for the two sections and the funding source.

Table 2-5: 2018 Budget Summary

Budget	Budget Amount	Funding Source
520 Solid Waste Management Complex	~\$8.0M	Requisition Tipping fees
515 Curbside Collection	~\$1.6M	Annual User fees RecycleBC

The annual budget does not include capital expenditures, or curbside collection programs that are implemented by member municipalities. Capital expenditures budgeted in 2018 were \$3.9M which included costs for construction of the Meade Creek Recycling Centre.

The overall expenditures for the CVRD for 2018 is summarized in the following Table 2-6 and Figure 2-3.

Table 2-6: Summary of 2018 Expenditures

Expense Categories	Total
Garbage Disposal	\$2,706,200
Operations - Disposal	\$1,482,232
Curbside Collection - Garbage	\$197,963
Curbside Collection - Recycling	\$418,563
Operations - Recycling	\$1,947,945
Reduction and Recycling Programs	\$395,145
Planning, Operations Support, and Execution	\$768,345
Debt	\$731,043
CVRD Internal Allocations	\$585,417
Legal & Administrative	\$331,245
Total	\$9,564,100

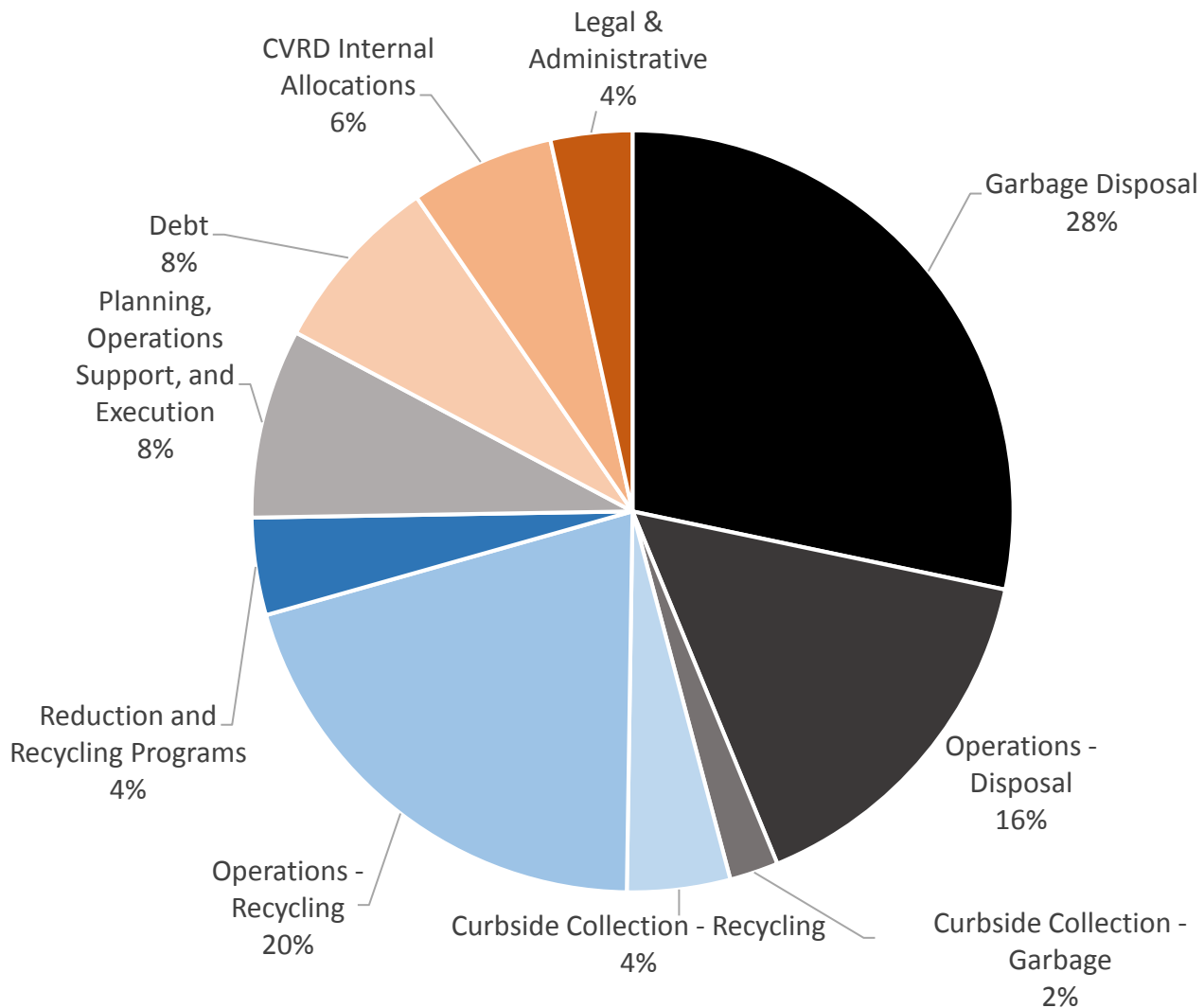


Figure 2-3: CVRD Expenditures

2.5.2 Staffing

The Recycling and Waste Management Division is led by a manager, who oversees three Environmental Technologists and a Superintendent. Based at the Ingram Street office, the Environmental Technologists are mainly responsible for planning, budgeting and program administration. Their work is supported by administrative support staff who also provide Recycling Hotline services. The Superintendent is responsible for operations staff which include site attendants and truck drivers, and are based at the Bings Creek Recycling Centre. Operations staff are responsible for program operation including curbside collection, roll-off container hauling, and operation of the Bings Creek Transfer Station and Recycling Centre and two satellite Recycling Centres at Peerless Road (Ladysmith) and Meade Creek (Lake Cowichan). An organization of the division is illustrated below.

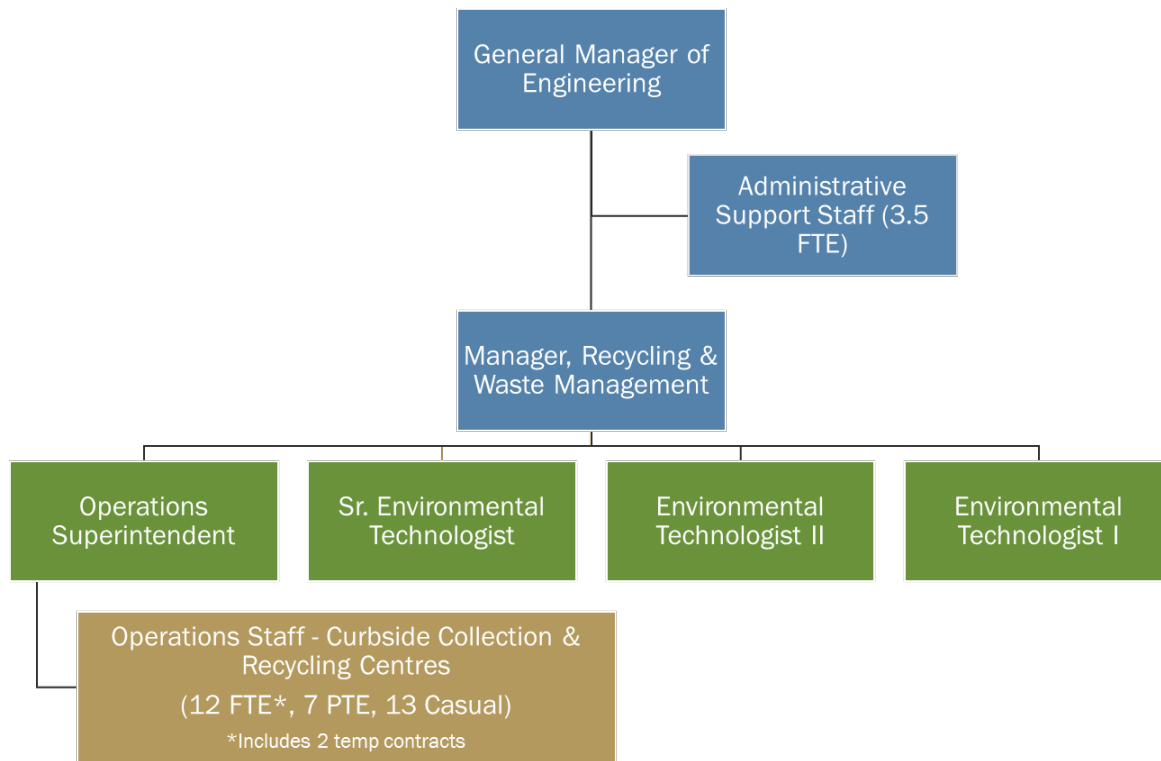


Figure 2-4: Organization Chart for CVRD Recycling and Waste Management Division

2.6 Additional Planning Inputs

The following section outlines the roles of the various players in the waste management system, and explains how policy tools can be applied. These will help to inform the SWMP Update.

2.6.1 Waste Management Plan System Participants

Table 2-7 provides a list of the various organizations that contribute to municipal solid waste management in the CVRD.

Table 2-7: Municipal Solid Waste Management Participants

Who	Roles in Solid Waste Management
Federal Government	<ul style="list-style-type: none"> Regulates waste management facilities under federal jurisdiction
Provincial Government	<ul style="list-style-type: none"> Approves Solid Waste Management Plans as regulated through the Environment Management Act Regulates Extended Producer Responsibility (EPR) programs through the Recycling Regulation Authorizes discharges to the environment through permits and operational certificates Responsible for enforcement of Provincial regulations and the conditions set out in discharge permits and operational certificates Various Ministries have several other regulatory authorities related to waste management
Cowichan Valley Regional District	<ul style="list-style-type: none"> Develops plans to provide big picture oversight of waste management in the region Owns and operates public waste management facilities Through regional plans and plan implementation (including bylaws), works to meet regional waste disposal goals and targets and ensures that the communities have access to facilities and services Collaborates and cooperates with local organizations, businesses and agencies to implement plans and new programs Ensures that legislative and policy requirements are followed, including monitoring and reporting Supports the provision of EPR programs in the CVRD Provides waste management related education and promotion of programs
CVRD Member Municipalities	<ul style="list-style-type: none"> Collaborate with CVRD to support SWMP Update implementation, provide collection services, and consult with CVRD on operational activities under regional jurisdiction.
Extended Producer Responsibility (EPR) Producers and Agencies	<ul style="list-style-type: none"> Ensures reasonable and free consumer access to collection facilities Collects and processes stewarded products Coordinates local government delivery as a service provider where applicable Provides and/or funds education and marketing Provides deposit refunds to consumers (where applicable) Monitors and reports on key performance indicators such as recovery rates to the Province on a regional district basis (when possible)
First Nations Communities	<ul style="list-style-type: none"> Provides waste management services to residents and businesses
Non-Profit Sector	<ul style="list-style-type: none"> Applies for waste reduction funding through the available grant programs Engages in and promotes reuse and upcycling
Residents and Businesses	<ul style="list-style-type: none"> Responsible for carrying out proper waste reduction, recycling and disposal activities Collaborates and cooperates with local government initiatives Provides collection, processing, and infrastructure needs for solid waste management
Neighbouring Jurisdictions	<ul style="list-style-type: none"> Identifies and engages in opportunities for collaboration and cooperation

2.7 Policy Tools

Policies and bylaws have an important role in defining how solid waste should be managed in the CVRD. They can be applied to further overcome obstacles related to promoting diversion. The following sub-sections describe current CVRD solid waste bylaw components as well as provide an overview of how effective implementation of disposal ban bylaws can inform strategy implementation.

2.7.1 CVRD Bylaw Overview

The CVRD has adopted bylaws that promote sound environmental management for regional waste systems, and which support the CVRD's waste reduction and diversion goals. There are five solid waste bylaws that inform the CVRD's solid waste management system. The disposal bans regulated under the Solid Waste Management Charges & Regulations Bylaw could be adjusted as noted below.

- Bylaw No. 3716 – Smoke Control Regulation Bylaw, 2013
 - Description – the Smoke Control Regulation Bylaw aims to reduce air pollution from smoke by restricting backyard burning of yard waste to two, one-month periods during the spring and fall. Other restrictions, including minimum set-backs and limits to the types of material that can be burned, also apply.
- Bylaw No. 2020 – Landclearing Management Regulation Bylaw, 2006
 - Description – the Landclearing Management Regulation Bylaw also aims to reduce air pollution from burning. Targeted at developers, this bylaw bans the open burning of large or machine-stacked quantities of landclearing debris, and requires that debris be burned in an air curtain burner, or chipped, ground or transported off-site. Forestry and agricultural burns are exempt.
- Bylaw No. 2570 – Waste Stream Management Licencing Bylaw, 2004
 - Description – This bylaw authorizes the CVRD to licence any private waste management facility. Facilities are issued operating licences by the CVRD and are monitored to ensure they meet stated management, volume and performance targets.
- Bylaw No. 1958 – Garbage and/or Recyclable Materials Collection Bylaw, 1999
 - Description – Garbage and/or Recyclable Materials Collection Bylaw – regulates the curbside collection program including bin sizes and annual fees. Currently the CVRD runs a user pay system where residents that use larger garbage totes pay more per year. Available tote sizes are: 140L (standard offer), 240 and 360L. Recycling totes come in the same sizes (standard offer is 360L) but the fee is the same regardless of size.
- Bylaw No. 2108 – Solid Waste Management Charges & Regulations Bylaw, 2000
 - Description – This bylaw regulates all activities at Recycling Centres and transfer stations including accepted materials and rates. The bylaw also sets out a free tipping policy for clean up of illegally dumped waste. Recyclable materials are banned for disposal (and subject to fines of double the tip fee i.e., \$280/tonne). Recyclable materials not currently banned from disposal include:
 - Glass containers
 - Non-commercial organic waste (i.e., compostable organic material from residential generators)
 - Commercial organic waste (i.e. organic waste from ICI generators) is currently banned but has not been enforced or widely promoted for several years. Introduction of a full organics disposal ban or any other material ban would require amendment of the bylaw. See Section 2.7.2 for more information about how bans can be effectively implemented.

2.7.2 Disposal Bans

Many regional districts and municipalities implement disposal bans on recyclable and compostable materials to encourage and/or mandate source-separation and diversion without relying solely on variable tipping fees. This is a low-cost policy tool used to signal to waste generators and waste collection companies that there is an expectation to separate and recycle/compost specific materials that have available alternatives (e.g. cardboard, metal, yard waste).

Disposal bans are enforced at the point of disposal (i.e. at transfer stations and landfills) through the application of significant surcharges on garbage found to contain banned materials. To ensure sustained success, disposal bans require the local government to work closely with waste generators (residential and ICI sectors) and waste haulers to design, start up and maintain this policy. Several regional districts have followed these steps when implementing disposal bans:

1. **Regulate** (decide to ban a waste stream with a readily available alternative to landfilling)
2. **Collaborate** (work with affected stakeholders to determine the timing of implementation and the ramp up of behaviour change-oriented technical assistance support and programming and enforcement measures)
3. **Educate** (make sure all haulers and waste generators are aware of the upcoming new disposal ban, and plan to communicate regularly)
4. **Enforce** (enforce the disposal ban at the point of disposal).

Approaches to Disposal Ban Enforcement

The approach to enforcing disposal bans has evolved over the last decade as regional districts have gained more experience with this policy tool. Enforcement is only one component of an integrated approach to implementing a disposal ban. As indicated in Figure 2-5, collaboration with waste haulers and generators is essential not only during the design of a disposal ban but also during implementation.

Many regional districts have discovered that the need to enforce a disposal ban is short-term and minimal if adequate up-front collaboration with waste haulers, supported by effective education of waste generators, results in diversion becoming “business-as-usual”. In effect, waste haulers become the enforcers since the implementation of a disposal ban provides them with an opportunity to increase their market share if they can provide more cost-effective collection options to their customers.



Figure 2-5: Integrated Disposal Ban Design and Implementation

Local governments need to provide resources to support enforcement efforts. There are a number of approaches with respect to disposal bans on cardboard, mixed waste paper and scrap metal. In the Capital Regional District, dedicated bylaw enforcement officers work on the landfill inspecting loads at the working face and issuing fines if required. In the RDN, bans are enforced at the landfill by RDN equipment operators who notify a supervisor to inspect the load, take pictures and then advise the scale clerk to apply a surcharge to the load. This information is then passed on to a Zero Waste Compliance Officer who follows up with the hauler and generator to educate then on compliance options. In Metro Vancouver, contactors are hired to inspect load entering their facilities and issue fines (i.e. 50% load surcharge) when material ban limits are exceeded.

It is important to note that the goal of the surcharge is not to make money for the regional district but to provide an opportunity to educate and maintain enforcement efforts. In most cases the first infraction results in a warning while the second infraction results in a surcharge. Most infractions occur within the first six to twelve months of ban implementation after which fines become minimal as waste diversion becomes business as usual.

Metro Vancouver refined this approach with the introduction of their food scraps disposal ban in January 2015. From 2012-2013, Metro Vancouver planned their organics diversion strategy in collaboration with stakeholders and then released their implementation strategy in 2014. The strategy was based on a phased implementation approach as illustrated in Figure 2-6 below. Although the ban was effective January 2015, the first six months was considered as an education period with no surcharge on tipping fees. However, from July to December 2015, if a hauler arrived with a load at a transfer station or disposal facility containing more than 25% food scraps, a 50% surcharge was applied to their tipping fee. This 20% threshold was reduced to 10% in 2016 and then down to 5% in 2017.

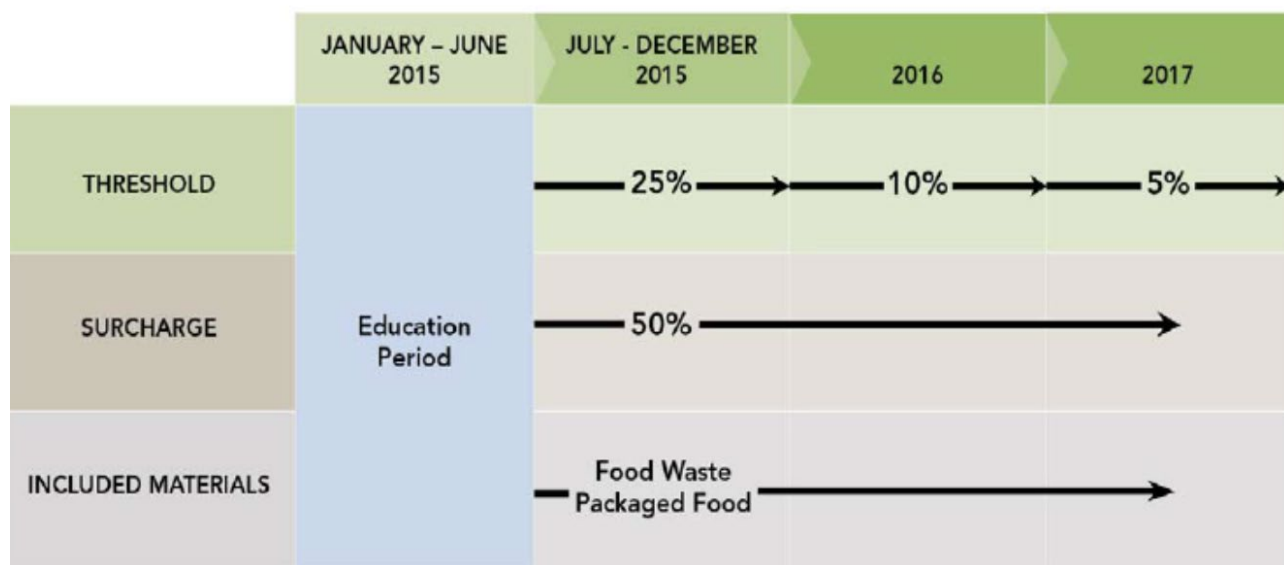


Figure 2-6: Metro Vancouver Organics Disposal Ban Phased Implementation

Although Metro Vancouver hired contracted enforcement staff at their facilities to inspect incoming loads for food waste, most regional districts have used their own staff to enforce disposal bans on a wide range of materials. This is because, as discussed above, enforcement activity is usually short-term while waste generators and haulers adjust to new waste management behaviours.

Metro Vancouver's phased approach was extremely successful and has been adopted by other regional districts as they introduce their own disposal bans. Most recently, in 2017 the Regional Districts of Fraser-Fort George and Bulkley Nechako approved a commercial cardboard diversion program that will apply phased surcharges and thresholds to loads containing cardboard. This program will be implemented by regional staff.

3.0 AREAS FOR IMPROVEMENT

While the CVRD is a leader in recycling and waste diversion, there are several areas where improvements can occur. The following potential areas of improvement are listed below.

3.1 Reduce and Reuse

Opportunities exist to improve waste management at the top of the waste prevention hierarchy. These include the following:

- Reducing wasted food at the residential and commercial level
- Enhancing and improving reuse opportunities

3.2 Recycling

More than half of the garbage generated in the region comes from ICI and Multi-Family generators. Waste composition results that were completed in 2017 indicate there are recyclable or compostable materials that can be

diverted from disposal. Developing and enforcing material disposal bans can potentially enhance waste diversion rates from the largest waste sectors and this would promote a more consistent message for waste management practices in the regional district.

Removing barriers and providing convenient access to recycling opportunities is an important strategy for improving recycling rates within residential, MF and ICI sectors. In the CVRD, the majority of residents are within a fifteen-minute drive of a public recycling drop-off depot. The lack of a public drop-off depot in the south end means that the more than 18,000 residents in Electoral Areas A, B and C must drive further to access the same level of service, or that alternative service models are required to provide equitable access to service. Many households in the region also do not have access to garbage or organics collection services at curbside. Options to enhance services are required to enable more recycling and diversion to occur.

Organics management is a big reason why the CVRD has one of the lowest disposal rates in the Province. Although organics diversion is well established in the regional district, over 33,000 residents in Electoral Areas do not have organics collection. Furthermore, the organic processing facilities are accepting more and more materials, much of which is coming from outside of the region. The success of these facilities is resulting in processing challenges that are creating unacceptable odours and impacting residents and businesses in their respective areas. Improving standards in a fair and equitable manner is required to ensure the success of the organics processing industry in the CVRD.

Recycling processing capacity is limited for commingled ICI recyclable materials and for C&D materials. Options to expand processing capabilities for these materials could be improved.

3.3 Residual Management

Approximately 30,000 tonnes of waste is disposed from the CVRD annually. There are also several historic disposal facilities that require ongoing maintenance and monitoring to ensure the environment is not compromised. Several strategies to improve residue management should be considered. Shipping and disposing refuse to landfills in the United States has additional financial, political, and environmental risks to manage. Options to improve residual management should be investigated and evaluated. In addition to residual management options, plans should be developed for the management of disaster debris, difficult to dispose items and illegal dumping.

4.0 STRATEGIES FOR CONSIDERATION

Options presented below take into consideration the existing solid waste management system and are presented in order of the waste prevention hierarchy.

4.1 Strategy 1: Reduce and Reuse Opportunities

This SWMP review process has identified issues and associated program and policy options available to reduce the current disposal rate of 358 kilogram per capita. The issues and options are summarized below.

4.1.1 Strategy 1A: Reduce Wasted Food from Residential and Industrial, Commercial, and Institutional (ICI) Sectors

Issues:

- Approximately 1,300 tonnes of edible and donatable food is being wasted by the residential sectors (single family and multi-family).
- Approximately 4,700 tonnes of edible food food is being wasted by the ICI sector.

These numbers reflect the food currently being disposed. Since municipalities in the CVRD have mature, well-established food scraps collection programs, it is likely that edible or donatable food is being recycled in municipal curbside organics programs as well. The amount of edible and donatable food wasted overall is estimated to be 6,700 tonnes. Preventing food from being wasted will reduce the amount of organics requiring processing and greenhouse gas emissions. The production of wasted food is estimated to release 1,600 kg of CO₂ per tonne of wasted food.

4.1.1.1 Promote Residential Food Waste Reduction

Food waste reduction and rescue has become paramount in recent years. The United Nations Food and Agriculture Organization (FAO) estimates that a third of food produced for human consumption is lost or wasted globally, amounting to 1.3 billion tonnes of food per year. In British Columbia, the Ministry developed food waste reduction tools¹ for residential and commercial sectors including a *Food Waste Reduction Toolkit* tailored to municipalities.

The CVRD could consider adopting a well-established residential food waste prevention campaigns such as “Love Food Hate Waste”. This program was designed by Waste and Resources Action Programme (WRAP – an UK organization) and is being utilized by several Canadian municipalities. The National Zero Waste Council adapted the “Love Food Hate Waste” program for Canadian municipalities and has resources available to share with participating jurisdictions². The national launch of “Love Food Hate Waste” is planned for May 2018. It is designed to raise awareness to reduce the amount of wasted food by partnering with business and government to design and implement campaigns and tools to actively promote behaviour change. CVRD could consider participating in “Love Food Hate Waste” as a local implementing partner.

4.1.1.2 Build Local Food Rescue Capacity for the ICI Sector

The CVRD could move towards improved food rescue capacity through the following actions:

- Convening with stakeholders who may have a surplus or shortage of food (e.g. large food producers and food banks);
- Creating a database of stakeholders who may have a surplus or shortage of food;
- Advocating to provincial and federal governments for a tax incentive to encourage businesses to donate surplus food;
- Creating toolkits and platforms that allow businesses and residents to learn how surplus food can be donated and utilized;

¹ BC Ministry of Environment and Climate Change Strategy, 2017. Food Waste Reduction Tools & Resources. <http://www2.gov.bc.ca/gov/content/environment/waste-management/recycling/organics/tools-resources>

² Metro Vancouver, 2017. Love Food Hate Waste Canada. <http://www.lovefoodhatewaste.ca>

- Collaborating with Island Health (Health Authority) to define safe food donation practices; and
- Collaborating with local non-profit organizations dedicated to food rescue.

4.1.2 Strategy 1B: Explore Reduction and Reuse Opportunities

Issues:

There are opportunities to enhance the CVRD's programs at the top of the waste prevention hierarchy (reduction and reuse) to reduce waste, associated environmental impacts and financial implications.

Free stores are located at all CVRD Recycling Centres, where residents pay standard tipping fees to drop off items but may take items for free. These initiatives – plus potentially partnering with charities – could be built upon to more actively capture textiles. There are also local reuse opportunities through online platforms such as UsedCowichan and Kijiji.

Other platforms for reuse could also be explored, such as repair cafes, tool libraries, or building supply reclamation. The CVRD could support these programs through:

- Collaborating with municipalities on zoning for these types of spaces and/or businesses to reduce barriers for entrepreneurs and residents to set up these types of organizations;
- Providing grants for organizations to implement these initiatives; and
- Convening with stakeholders working in this space to identify opportunities for expansion.

4.1.3 Strategy 1C: Support Bans On Single-Use Plastic Bags and/or Other Single-Use Items

In January 2018, the City of Victoria adopted a new Checkout Bag Regulation Bylaw, wherein businesses are not allowed to sell or provide customers with single-use plastic bags. Similarly, the City of Vancouver is developing a Single-Use Item Reduction Strategy that explores waste reduction approaches for disposable cups, bags, and takeout containers.

While there are jurisdictional limitations to directly implementing product bans, the CVRD could explore similar programs and mechanisms used in other jurisdictions, such as advocating for senior government policy change and supporting municipal bans on specific items. The CVRD can also adopt policies or develop mandates to support bans or the reduction of Single-Use items within in the regional district.

4.1.4 Strategy 1D: Advocate for Expansion of EPR Programs

Issues:

- The CVRD currently accepts mattresses and bulky furniture at Bings Creek for recycling, however, recycling of these items is currently funded through tipping fees because there are no EPR programs for these items.
- 544 tonnes of textiles are disposed by the residential sector and 549 tonnes are disposed by the ICI sector. These materials are recyclable but are not managed by an EPR Program.

The Canadian Council for Ministers of the Environment (CCME) continues to provide guideline updates for Canada-wide implementation of EPR programs. Products not yet in the BC Recycling Regulation that are recommended for

Canada-wide EPR include carpet, textiles, and furniture. CVRD can continue to stay abreast of industry trends through conferences and annual updates as provided by the CCME and the BC Product Stewardship Council (BCPSC). There is also an opportunity to advocate for new programs through direct correspondence with the Ministry or through associations of which CVRD is a member (e.g. British Columbia Product Stewardship Council).

The CVRD currently accepts mattresses and bulky objects at Bings Creek and has a contract with a private sector entity to process these materials. More than 12,000 mattresses have been collected since the program's implementation in 2012. The CVRD funds this recycling initiative by charging high tipping fees for these materials. The CVRD's management of materials such as mattresses and bulky furniture presents an opportunity to justify the expansion of EPR to these materials. Several regional districts in the Province have also implemented similar programs.

4.2 Strategy 2: Reduce Disposal from ICI and Multi-Family Residential

Issues:

- Residential comingled recyclables such as paper and plastic containers (often referred to as “Blue box” materials), make up 13% of the ICI disposal stream and 15% of the multi-family disposal stream (compared to 9% in the single-family sector);
- Compostable organic materials make up 52% of the ICI disposal stream and 39% of the multi-family stream (compared to 23% from the single-family sector that have garbage, recycling, and organics collection);
- The multi-family sector annually disposes approximately 350 tonnes of “blue box” material and 950 tonnes of organic materials;
- The ICI sector annually disposed of 1,600 tonnes of “blue box” material and 6,500 tonnes of organic materials; and
- Nearly one-third of the waste disposed is recyclable or compostable material from the multifamily and ICI sectors.

4.2.1 Strategy 2A: Mandate Source Separation for the ICI and Multi-Family

Adopt policies and develop or update existing bylaws to require waste haulers who service the ICI sector and multi-family buildings to provide recycling and organics receptacles. These types of source separation requirements exist in almost all municipalities in Metro Vancouver. As a part of this strategy, behaviour change and enforcement measures should be considered, such as technical assistance support, waste audits of generators, bin checks, cameras on collection vehicles, and surcharges for not having all collection services in place.

Further to the proposed mandates, resources will be required to develop education materials, prepare proper signage, engage with stakeholders and monitor progress on a regular basis.

4.2.2 Strategy 2B: Collection Services Review for the ICI and Multi-Family Sector

A collection services review should be undertaken for the ICI and multi-family sectors to determine whether the service should be provided by public or private sector. Having the garbage and divertible materials be managed by separate sectors is not ideal because of competing interests. Stakeholder consultation should be conducted to determine the most efficient and effective approach to maximizing the diversion of recyclable and compostable materials from disposal.

4.2.3 Strategy 2C: Organics and Material Disposal Bans

The CVRD has some material disposal bans in place for recyclable and commercial organic materials. Adoption of a full organics disposal ban across sectors has been shown to have a considerable impact on increasing organics capture and reducing garbage. Robust promotion of the disposal bans along with behaviour change programs and stricter enforcement of these bans can improve adherence to bylaws. In communities that enforce material disposal bans and apply surcharges for non-compliance, haulers would be fined for loads containing a certain amount of the banned materials. These enforcement actions can reinforce collaboration opportunities between the CVRD and other key stakeholders such as collection service providers. Disposal bans can also motivate haulers to work with their customers to provide adequate service levels and behaviour change programs. Customers who resist adopting the new services would be charged a higher rate that would account for financial penalties.

4.3 Strategy 3: Reduce Disposal from Residential Sector

Issues:

- Most residents in the regional district are within a fifteen-minute drive of a publicly funded Recycling Centre; however, the lack of a public Recycling Centre in the south end means that the more than 18,000 residents in Electoral Areas A, B, and C do not share the same level of access
- Residents in Electoral Areas A, B, C and H are also not provided with a public curbside garbage collection service; service is available privately but not all residents are required, or able, to access it
- Over 33,000 residents in the CVRD (mostly living in Electoral Areas) do not have public sector organics collection. Residents in areas with no organics collection, either public or private, have 13% more organics in the garbage than in areas with organics collection.

4.3.1 Strategy 3A: Provide Equal Access to Publicly Funded Recycling Programs

The 2006 SWMP included a plan to develop a public drop off depot in the south end of the CVRD, to service Electoral Areas A, B, and C. Facility siting efforts were unsuccessful in 2011. In the interim, the CVRD has developed agreements with private facilities in Cobble Hill that allow south end area residents to drop off recyclables such as packaging and printed paper, and yard waste, for free. Other materials, including garbage, are accepted for a fee and are not covered under current agreements with the CVRD.

An assessment could be completed to determine whether a public south-end facility could be built or purchased. The key difference between public and private drop-off facilities is access to funding from taxes, which can allow public facilities to better support diversion programs over the long-term, and to reduce up-front drop off costs. In the CVRD, the majority of recyclable materials are accepted for free, while private facilities must charge a minimum drop-off fee to ensure operating costs are covered. This analysis should include community consultations to determine:

- The desire for a public drop-off facility;
- Understanding of community's preference for a public south-end depot versus expanded curbside collection; and
- The willingness to fund a public drop-off facility where nearly all recyclable materials are accepted for free and garbage disposal is a user pay system.

Alternatively, the CVRD should also consider whether expanding or extending an agreement with private facilities to service the south end of the regional district is more effective and efficient. The existing agreement allows residents to drop off yard waste and recyclable materials that are managed by Recycle BC (Packaging and Printed Paper) for free. At this time, there is a \$5 minimum drop off fee for other materials. The CVRD could explore expanding this agreement so that residents in the south end have access to the same service levels as residents who use CVRD Recycling Centres and do not pay a minimum drop off fee for recyclables.

4.3.2 Strategy 3B: Expand Universal Curbside Collection Services to be Consistent Across the Region

Universal curbside collection programs as compared to opt in programs (public or private) keeping consistent with the CVRD's current user pay approach have been shown to significantly increase diversion. Universal garbage collection can also reduce frequency of illegal dumping. As part of this strategy, a review to determine the most efficient and cost effective collection methods should take place along with an assessment of what materials are to be collected (e.g. yard trimmings plus food scraps vs. food scraps only, monthly glass collection). These can be implemented in house or through the provision of a contract.

As more BC jurisdictions adopt curbside collection of source separated materials, the capture rate for diverted items increased and garbage decreases by up to 40% by weight source separation.

The 2017 waste composition study showed that households with curbside organics collection have less organics in the garbage than household with optional organics collection or without organics collection, as presented in Table 4-1. The differences in composition is primarily due to increased food waste (and not due to yard waste from larger rural properties).

Service levels and cart sizing will need to be reviewed to determine the most effective and efficient approach for the regional district.

Table 4-1: Correlation of Organics in Garbage to Varying Service Levels

Service Level Description	Areas	Proportion of Organics in Garbage
Mandatory organics collection	All municipalities	23%
Optional organics collection	Electoral Areas A-C	30%
No organics collection	Electoral Areas D-I	36%

4.4 Strategy 4: Improve Organics Processing

Issues:

- Organics processing and diversion is one of the main reasons for high diversion rates in the CVRD.
- There are several organic processing facilities in the CVRD and many are generating unacceptable odour that are impacting residents and businesses.
- The amount of organics being processed continues to grow as more organics from outside the region are being imported to facilities in the CVRD.
- Facilities that process more organics than what they were designed to receive are susceptible to odour incidents. Odour complaints have been an issue in recent years in several nearby regional districts such as Metro Vancouver, Capital Regional District, and Regional District of Nanaimo. Unacceptable odour incidents

have led to closure of several organic processing facilities in other regions in the last five years using various instruments.

- Organics processing facilities are regulated under the Provincial Organic Matter Recycling Regulation (OMRR) and the CVRD licences solid waste management facilities such as composting facilities.

4.4.1 Strategy 4A: Best Management Practices for Odour Management

The CVRD and neighbouring regional districts are very successful in diverting organics from disposal. This success is putting pressure on processing facilities to manage odours and prevent impacts to neighbouring properties. Often processors are accepting more material than originally intended and best available control technology (BACT) are not being upgraded to account for the additional material. Third party verification of capital and operational works should be conducted to assess and explore opportunities to incorporate advanced processes or technologies for organics processing that may reduce odour impacts to the environment and receptors. Fair and equitable standards should be developed to ensure sustainable operation of organic processing facilities in the CVRD.

4.4.2 Strategy 4B: Ensure Priority for Locally-Generated Organics Processing

An increase to organics diversion within the region may put pressure on local processing capacity. The CVRD may need to consider mechanisms to secure local processing capacity to allow for the sustainable long-term operation of local diversion programs. There are currently no regulations that prevent organic materials from crossing regional district borders anywhere in British Columbia, and nearby regional districts have been unsuccessful in implementing this type of material flow regulations, so this would be a difficult undertaking.

4.4.3 Strategy 4C: Standardize Design Criteria to Protect Environment and Public

Develop design criteria and emission/odour limits to ensure odours are less likely to impact the environment and public in the CVRD. The BC Ministry of Environment has standards that apply across the province. The CVRD with its licensing capabilities can impose stricter requirements if there are reasonable grounds for doing so. These standards would be over and above the provincial requirements and may be challenged by existing organic processing facilities.

4.5 Strategy 5: Processing and Transfer Capacity for Recyclables

Issues:

- In 2006, most recyclable materials in the region were previously hauled to the Vancouver Island Recycling Centre which was located in the CVRD. This facility has since closed, and materials are hauled out of region to material recovery facilities (MRFs) in either the Capital Regional District (Victoria) or the Regional District of Nanaimo (Nanaimo).
- There are no facilities in the CVRD that accept comingled ICI recyclable materials and this material is typically hauled out-of-region or may not be collected at all because there is no local drop off location.

4.5.1 Strategy 5A: Feasibility Assessment for a Material Recycling Facility (MRF)

Determine whether it is feasible and necessary to build or support development of a MRF in the CVRD. This should take into consideration RecycleBC requirements, any MRFs that are nearby and recommendations to identify the most feasible options.

4.5.2 Strategy 5B: Feasibility Assessment for Transfer Capacity for ICI Recyclables

Recyclables from the residential sector are taken to the Bings Creek Transfer Station as per the RecycleBC arrangements. The CVRD could investigate options for the most feasible or cost-effective approach for managing ICI recyclables. This may include a feasibility study to assess the logistics and costs to accept comingled ICI recyclable materials at Bings Creek Transfer Station or at a private sector facility.

4.6 Strategy 6: Improve Management of Construction and Demolition Materials

Issues:

- Despite related disposal bans, there is still a significant portion of C&D materials in the garbage.
- There is limited disposal capacity for hazardous C&D materials (asbestos, gypsum wallboard) and the material is costly to manage and properly dispose.

4.6.1 Strategy 6A: Monitor C&D Disposal and Recycling Activities in the Region

C&D waste typically represents 25% to 35% of the waste stream, and recyclability of this material is typically in the order of 70% to 80%. The CVRD should conduct a C&D waste system analysis to determine how residents and businesses are managing C&D waste, where it is taken to and available capacity for managing this waste stream. This study can also assess the current recycling/waste diversion activities in the region and whether there is a need to develop mechanisms to further divert C&D materials from disposal.

4.6.2 Strategy 6B: Develop a C&D Waste Management Strategy

As part of the SMWP update implementation process, the CVRD could undertake a planning process to develop a C&D waste management strategy for the region. This would take into consideration the results from the C&D waste system analysis, consult with key stakeholders (i.e. construction industry, C&D waste processor, waste haulers, municipalities, etc.) and develop a strategy that follows the goals and principles of the SWMP. The strategy would set capture targets and specify that materials are to be taken to permitted facilities.

4.6.3 Strategy 6C: Reduce Barriers to Disposing Hazardous Materials (asbestos, gypsum wallboard)

Asbestos and gypsum wallboard may currently be disposed at Coast Environmental (Duncan and Chemainus locations). However, it is expensive for residents to dispose of these materials. The CVRD may consider reducing barriers to legally disposing of these materials by providing a disposal subsidy.

4.7 Strategy 7: Residuals Management

4.7.1 Strategy 7: Feasibility Study of Alternative Disposal Options

Issues:

- The CVRD has one of the highest tipping fees in British Columbia.

- Solid waste is exported to the Roosevelt Regional Landfill in Washington State, and the CVRD is responsible for transportation costs and the USD exchange rates.

Shipping waste across the Canada-USA border has many risks including fluctuation of the exchange rate, high transportation costs, challenges with marine traffic and potential border restrictions. The CVRD maintains a contingency disposal agreement with the Regional District of Nanaimo in the event exporting waste to the designated disposal facility is disrupted. It is recommended that the options for alternative and local disposal presented in Table 4-2 are explored. These options are not an exhaustive list. To ensure the efficiency of the disposal system, the CVRD should continue to explore the feasibility of alternative disposal mechanisms as opportunities arise.

Table 4-2: Options for Disposal

Option	Description
Continue Waste Export	Currently, waste is placed in shipping containers, barged to the mainland, transported by rail to Southeastern Washington State, and taken to the Roosevelt Regional Landfill for disposal. The empty shipping containers are brought back to the CVRD to be filled with waste again. This disposal program costs approximately \$130/tonne. Alternative disposal locations closer to home will continue to be investigated, for opportunities to reduce transport costs and/or exposure to exchange rate fluctuations.
Disposal at Comox Valley Regional Landfill	A new landfill was recently opened in Comox Valley. Preliminary conversations have indicated that the Comox Valley Regional District may be open to receiving waste from the Cowichan Valley Regional District. The feasibility of disposal at the Comox Valley Landfill should be explored.
Waste to Energy (Public Facility)	Two recent studies reviewed the feasibility of a Waste to Energy (WTE) facility for southern Vancouver Island. Both studies determined that viable technology exists but is not economically feasible. However, the 2018 SWMP could revisit the creation of WTE infrastructure in the CVRD if it is desired by the PAC and public.
Waste to Energy (Private Facility)	It is possible that a new private WTE facility may be built within the Cowichan Valley. The feasibility of disposal at this potential WTE facility should be explored.
New CVRD Landfill Development	The CVRD tried to site a landfill in the mid-1990s. An appropriate site was not found; thus, waste has since been exported out of region. If it is desired by the PAC and the public, an initiative for the 2018 SWMP could be to site and build a new landfill.

4.8 Strategy 8: Augment Illegal Dumping Prevention Strategies

Issue:

- Illegal dumping of materials occurs throughout the CVRD.

A campaign was conducted in 2016 to reduce illegal dumping in the Hillcrest Road area. Additionally, a “Free Tipping” policy was implemented in the early 2000s which provides financial incentives to non-profit organizations for cleaning up public lands or for appropriately disposing of waste dumped on their property.

However, illegal dumping continues to be a problem. The CVRD may wish to analyze the costs and ubiquity of illegal dumping to determine what other changes and programming may need to be made to existing strategies.

4.9 Strategy 9: Collection/Drop-off for HHW, Bulky Items and Organic Debris

Issues:

- The CVRD has no options for residents to safely dispose of household hazardous materials which are not managed by an EPR program.
- The CVRD has subsidized drop off but not have subsidized curbside collection for bulky items, such as furniture and mattresses, which may contribute to illegal dumping.

4.9.1 Strategy 9A: Round up event for HHW

The CVRD could begin to accept household hazardous materials (which are not managed by an EPR program) at CVRD Recycling Facilities. This could be implemented on a periodic (annual or seasonal) or year-round basis. The CVRD may also wish to create agreements (or expand existing agreements) with private facilities to subsidize them to accept these materials.

The CVRD could begin to accept household hazardous materials (which are not managed by an EPR program) at CVRD Recycling Facilities. This could be implemented on a periodic (annual or seasonal) or year-round basis. The CVRD may also wish to create agreements (or expand existing agreements) with private facilities to subsidize them to accept these materials.

4.9.2 Strategy 9B: Collection for bulky items

The CVRD could implement on-call or curbside collection system to have bulky items collected by area. If this strategy is chosen for further review, it would need to be determined whether this would be in place throughout the CVRD or in Electoral Areas only. If this service was to be offered in municipalities, it would need to be determined whether this service would be offered by municipalities or by the CVRD.

4.9.3 Strategy 9C: Effective ways to reduce open burning of wood waste

In some rural areas in the CVRD, residents burn yard waste, which has led to air quality issues. In addition, the accumulation of woody debris on larger, forested properties has been identified as a fuel-loading hazard for fire. Strategies to address these issues include reviewing the feasibility of offering yard waste collection at curbside, either regularly as part of a food waste collection program, or seasonally as a stand-alone program, and/or implementation of a seasonal wood chipping service, which could be operated at a fixed location within communities or at the curbside, and run by public sector staff or private contracted operators.

4.10 Strategy 10: Monitor Historic Disposal Sites

Issue:

- The CVRD has a number of closed disposal sites that require ongoing monitoring and attention: Koksilah Sanitary Landfill, Koksilah Road Incinerator Ash Landfill, Peerless Road Incinerator Ash Landfill, and Meade Creek Incinerator Ash Landfill (ash landfill closure is in progress at the time of writing).

The CVRD needs to continue monitoring and assessing the state of these historic disposal sites and implementing measures that minimize potential impacts to the environment. These sites should have annual resources to monitor

and address potential concerns. Monitoring requirements should continue unless it can be demonstrated that these sites are no longer an environmental concern.

4.11 Strategy 11: Operational Improvement

4.11.1 Strategy 11A: Create an Asset Management Plan

Issues:

- The CVRD Recycling and Waste Management Division owns a number of mobile (trucks/equipment) and stationary (buildings) assets. Mobile assets have varied life spans; stationary structures typically last longer than mobile assets.
- It is prudent to understand the assets that the Division holds and the operational and financial considerations to manage the solid waste system in a sustainable manner.

In 2016, the CVRD adopted an Asset Management Policy and is committed to applying recognized holistic Asset Management practices in its strategic planning, operations and financial management systems to deliver sustainable services to its communities and direct customers. An asset management strategy is current under development for the organization. Eventually, the strategy should include all assets for the solid waste management system including fleet, and will set out how those assets are operated and managed, lifespan of those assets, cost of assets and financial plan to pay for the assets (replacement or repair) and where the revenues would come from.

4.11.2 Strategy 11B: Bings Creek Transfer Station 10-Year Plan

Issues:

- Bings Creek receives most of the waste in the regional district. This facility accepts many waste streams and the future function and capacity of this facility needs to be determined.
- Bings Creek does not receive ICI sector recyclables. Although residential recyclables are received at the transfer station, there is very little room to receive any more material. The transfer station building received both residential recycling and waste destined for disposal from residential and commercial sources.
- Bings Creek is not equipped with compactors or balers. Purchasing this equipment may lead to operational efficiencies.

The future role of the Bings Creek Transfer Station needs to be determined. This should take into consideration the type and amount of material it would be receiving, any processing that could occur on site and a condition assessment of the structures as part of an organization-wide asset management program.

4.12 Strategy 12: Disaster Debris Management Plan

Issues:

- The CVRD currently does not have an emergency management plan for solid waste in the event of a natural disaster.

Several Canadian municipalities, such as Fort McMurray, interior BC, and Calgary, were affected by fires or floods. These types of disasters create a chaotic situation and require a management plan to deal with the large amounts

or different types of waste that will require disposal or staging. Consideration should be given to developing an Emergency Management Plan for public waste management facilities. The CVRD is susceptible to fires, floods and earthquakes.

4.13 Strategy 13: Education and Behaviour Change Considerations

Increased education is not presented as a separate strategy in this document. Many of the strategies outlined herein would require CVRD residents to change their behaviour. To be successful, these strategies would require education programs to be expanded.

In addition to continuing to promote waste reduction and diversion programs through vivid print and electronic communications tools, social media (e.g., Facebook, Twitter, YouTube), and hands on technical assistance, other behaviour change tools can be integrated into education efforts. The behaviour change tactics outlined within community-based social marketing (CBSM) can provide a framework for how to most effectively target a specific behaviour. Derived from social marketing by Doug McKenzie-Mohr, an environmental psychologist, CBSM offers several behaviour change tools that can be incorporated into existing and future education initiatives. Examples of CBSM behaviour based tools include:

- **Commitment** – By agreeing to a small request, people have subsequently been found to be far more likely to agree to a larger request.
- **Prompts** – Prompts can also be used to encourage people to engage in positive behaviour. By providing visual or auditory aids, people are reminded to perform a particular action. Prompts often take the form of a sticker or tag posted in close proximity to the action.
- **Norms** – Norms guide how we behave and are largely influenced by the behaviour of those around us. If members of our community, especially our immediate networks, are living sustainably, we are more likely to do the same.
- **Social Diffusion** – New behaviours are frequently adopted because friends, colleagues, or competitors have changed certain behaviours. To encourage social diffusion, make commitments to new behaviours public and visible (such as adding a sticker for another environmental behaviour to the side of a collection container) and/or recruit well known and respected opinion leaders in the community to promote a specific behaviour.
- **Communication** – The more relevant messages are to a group, the more likely it is to captivate someone's attention.
- **Incentives/Disincentives** – Closely pairing an incentive, or reward, to specific positive behaviour can have a substantial impact on encouraging sustainable activities. This strategy is particularly useful when motivation to engage in action is low or people are not doing the activity as effectively as they could.
- **Convenience** – Consider the external barriers related to a project, how they can be overcome, and what resources are needed to successfully address them.

5.0 TARGET SETTING

A SWMP should clearly outline goals for the duration of the plan. Although the plan outlines strategies for the next ten years, it is important to take into considerations overarching initiatives that may span over twenty or thirty years. The Ministry has defined the following goals for British Columbia to achieve by 2020:

- 75% of British Columbia's Population covered by Organic Waste Disposal Restrictions;
- 75% Recovery of Materials Covered by Extended Producer Responsibility Programs (EPR); and
- Provincial Disposal Rate of 350 kg per capita per year (or lower).

With a disposal rate of 358 kg per capita, the CVRD is at the forefront of meeting the Ministry's Provincial goals. EPR programs are active in the CVRD and it needs to be determined whether 75% of EPR materials are being recovered. Businesses and institutions in the CVRD are covered by an organic waste disposal restriction and most residents in the CVRD are serviced with curbside collection programs for organic materials, however, there is no residential organic waste disposal restriction. Thus, this Plan will need to consider whether more ambitious goals should be pursued. Suggested goals for this plan update include:

- Target a Regional Disposal Rate of 180 to 300 kg per capita per year by 2030; and
- Adopt "Zero Waste" as a goal for the plan.

5.1 Target a Regional Disposal Rate

Based on the analysis in Section 2.4, the CVRD has the potential to reduce kg per capita garbage to below 300 kg per capita based on how current and new strategies are implemented. Table 5-1 lists how some of the sectors would be potentially affected by the proposed strategies above and bring the disposal rate down to 280 kg per capita.

Table 5-1: Diversion Potential with Programs Implemented

Sector (Contribution to Landfill %) ²	Material Type	Diversion Potential out of Landfill (%)	Diversion Potential out of Landfill ¹ (kg/capita)
Single-Family (Municipalities) 10%	Curbside Recyclable Material	30%	1.1
	Depot Recyclable Material (EPR)	30%	0.8
	Wasted Food	30%	1.3
	Inedible Organic Materials	30%	1.9
	Building Materials	20%	0.2
	Textiles	30%	0.8
	Bulky Objects	10%	0.0
Single Family (Municipalities) Diversion Potential			6.3
Single-Family (Electoral Areas) 9%	Curbside Recyclable Material	30%	0.8
	Depot Recyclable Material (EPR)	50%	1.1
	Wasted Food	60%	3.8
	Inedible Organic Materials	50%	3.8
	Building Materials	30%	0.4
	Textiles	10%	0.2
	Bulky Objects	20%	0.0
Single Family (Electoral Areas) Diversion Potential			10.0
Multi-Family 8%	Curbside Recyclable Material	30%	1.3
	Depot Recyclable Material (EPR)	10%	0.3
	Wasted Food	30%	1.5
	Inedible Organic Materials	30%	1.9
	Building Materials	10%	0.0
	Textiles	20%	0.3
	Bulky Objects	30%	0.0
Multi-Family Diversion Potential			5.3
Industrial, Commercial & Institutional 41%	Recycling Materials - Containers and Paper	45%	8.4
	Depot Recyclable Material (EPR)	20%	1.6
	Wasted Food	50%	25.4
	Inedible Organic Materials	40%	10.6
	Building Materials	20%	0.8
	Textiles	30%	2.0
	Bulky Objects	20%	0.1
ICI Diversion Potential			48.9
Drop Off 16%	Containers and Mixed Paper Recyclables	20%	0.6
	Depot Recyclables	30%	1.4
	Wasted Food	10%	0.1
	Inedible Organic Materials	10%	0.2
	Building Materials	20%	2.2
	Textiles	10%	0.4
	Bulky Objects	20%	1.5
Drop Off Diversion Potential			6.4
Construction & Demolition 16%	Containers and Mixed Paper Recyclables	10%	0.0
	Depot Recyclables	20%	0.3
	Wasted Food	30%	0.0
	Inedible Organic Materials	10%	0.1
	Building Materials	20%	0.1
	Textiles	30%	0.2
	Bulky Objects	10%	0.2
C&D Diversion Potential			0.9
Potential Additional Diversion from Landfill			77.8
Estimated Annual Disposal (assuming 358 kg/capita)			280.2

¹Note some materials with 0 estimated – based on the waste composition study – may still show up in these material categories by sector.

5.2 Financials and Staffing

This sub-section summarizes the financial and staffing resources for the CVRD.

5.2.1 Zero Waste

“Zero Waste” is a goal that several BC regional districts have adopted, including the Regional District of Nanaimo (RDN), Metro Vancouver, and the Regional District of Kootenay Boundary. The CVRD has also adopted this goal in previous Solid Waste Management Plans, including the 2006 Plan.

Zero Waste is a visionary goal intended to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste means moving towards a circular economy, wherein ‘waste’ is viewed as a resource, and maximum value is extracted from all resources before they are eventually recovered or regenerated³.

A Zero Waste goal suggests a move towards the systematic redesign and management of products and processes to avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. The ultimate realization of Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.⁴

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³WRAP UK, <http://www.wrap.org.uk/about-us/about/wrap-and-circular-economy>

⁴ Zero Waste International Alliance, <http://zwia.org/standards/zw-definition/>

7.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

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The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

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This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

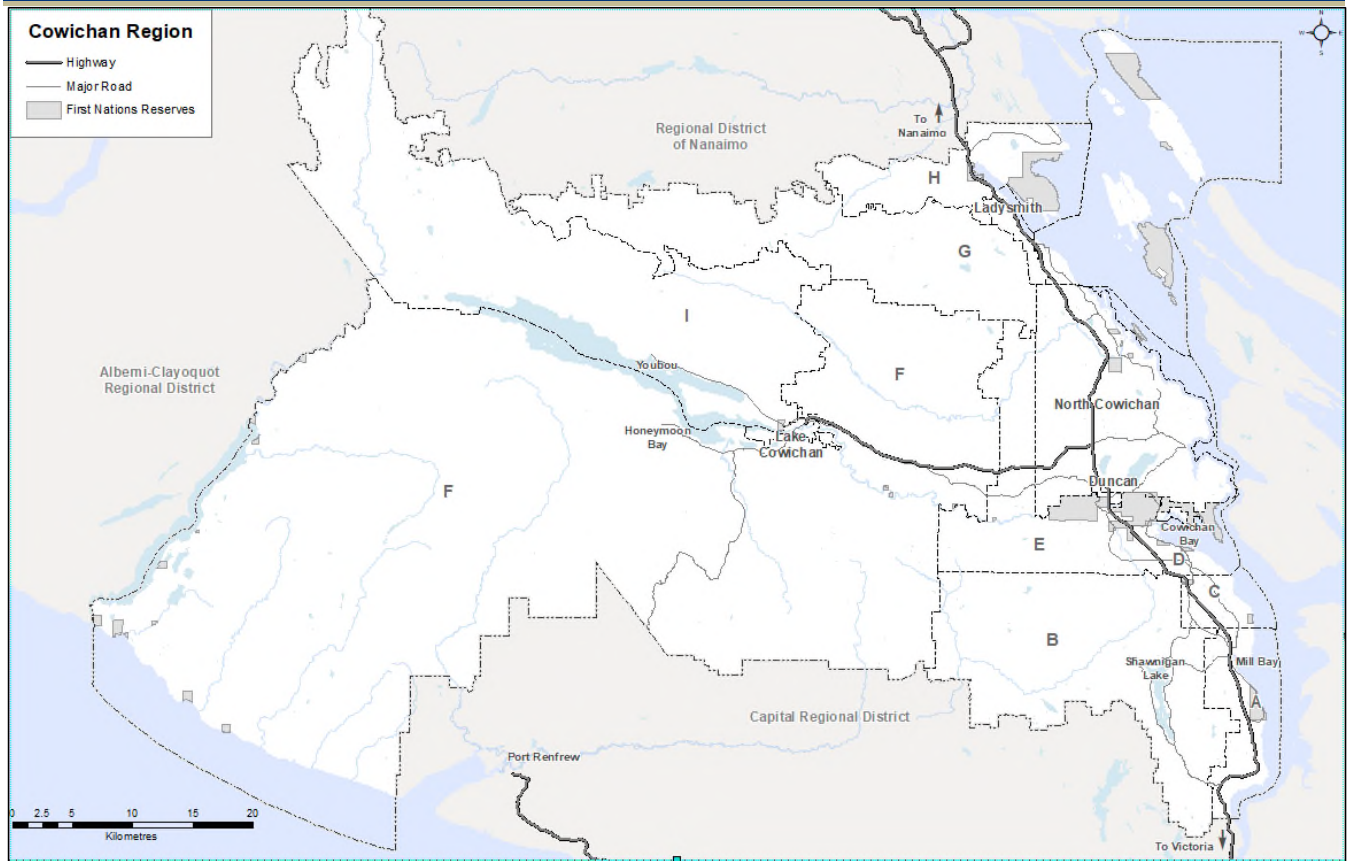
1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX D

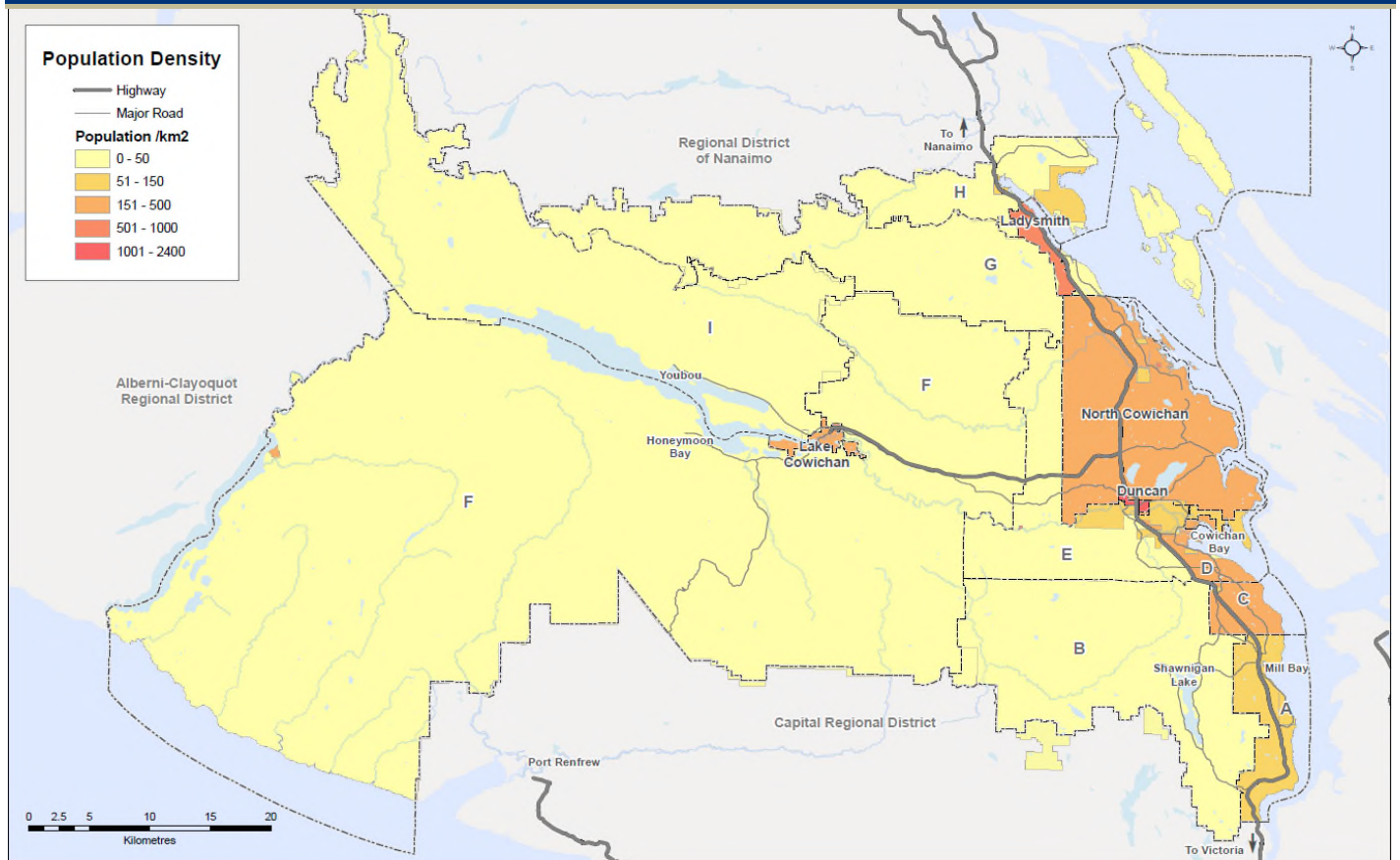
CVRD MAPS

MAP 1: COWICHAN VALLEY REGIONAL DISTRICT



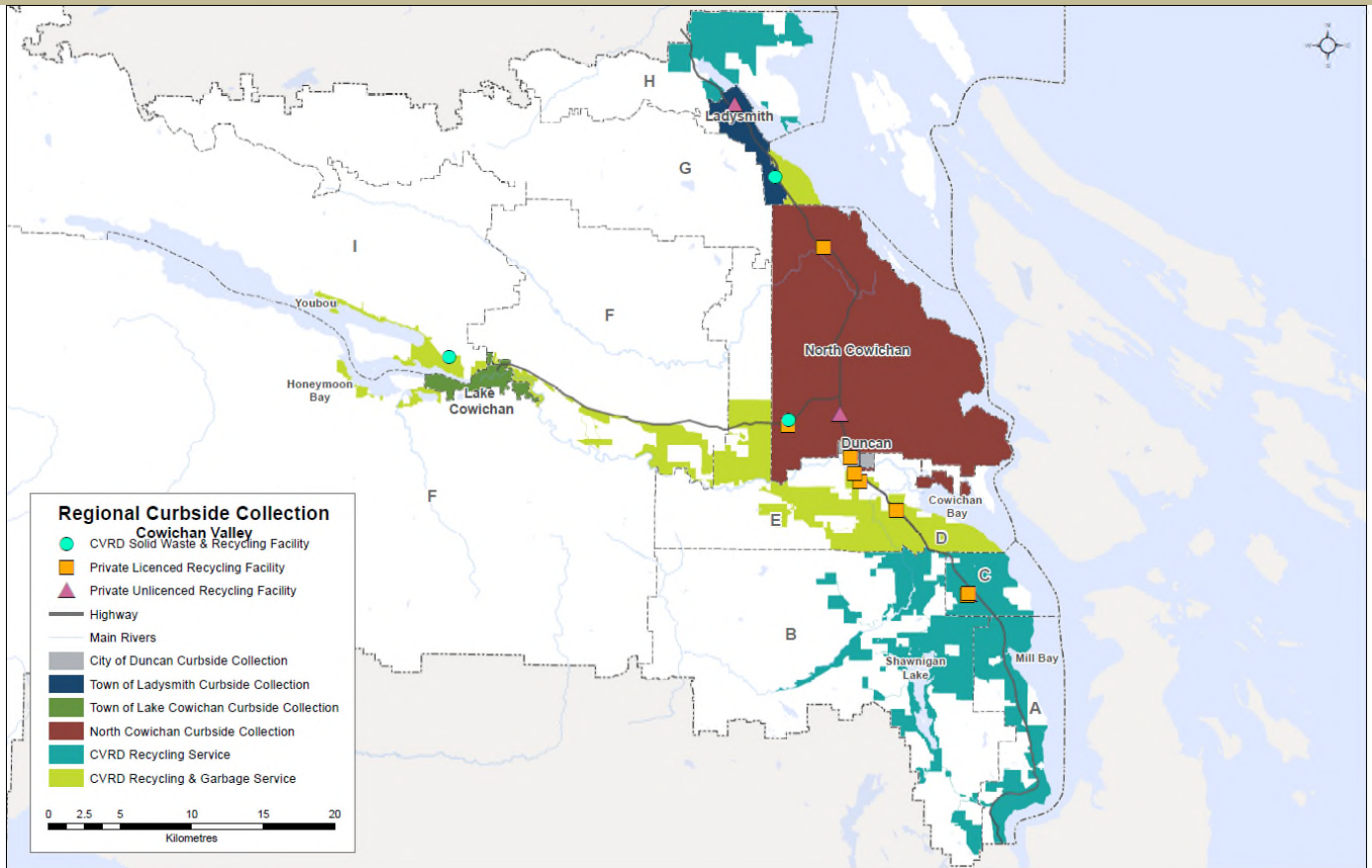
D-1

MAP 2: POPULATION DENSITY



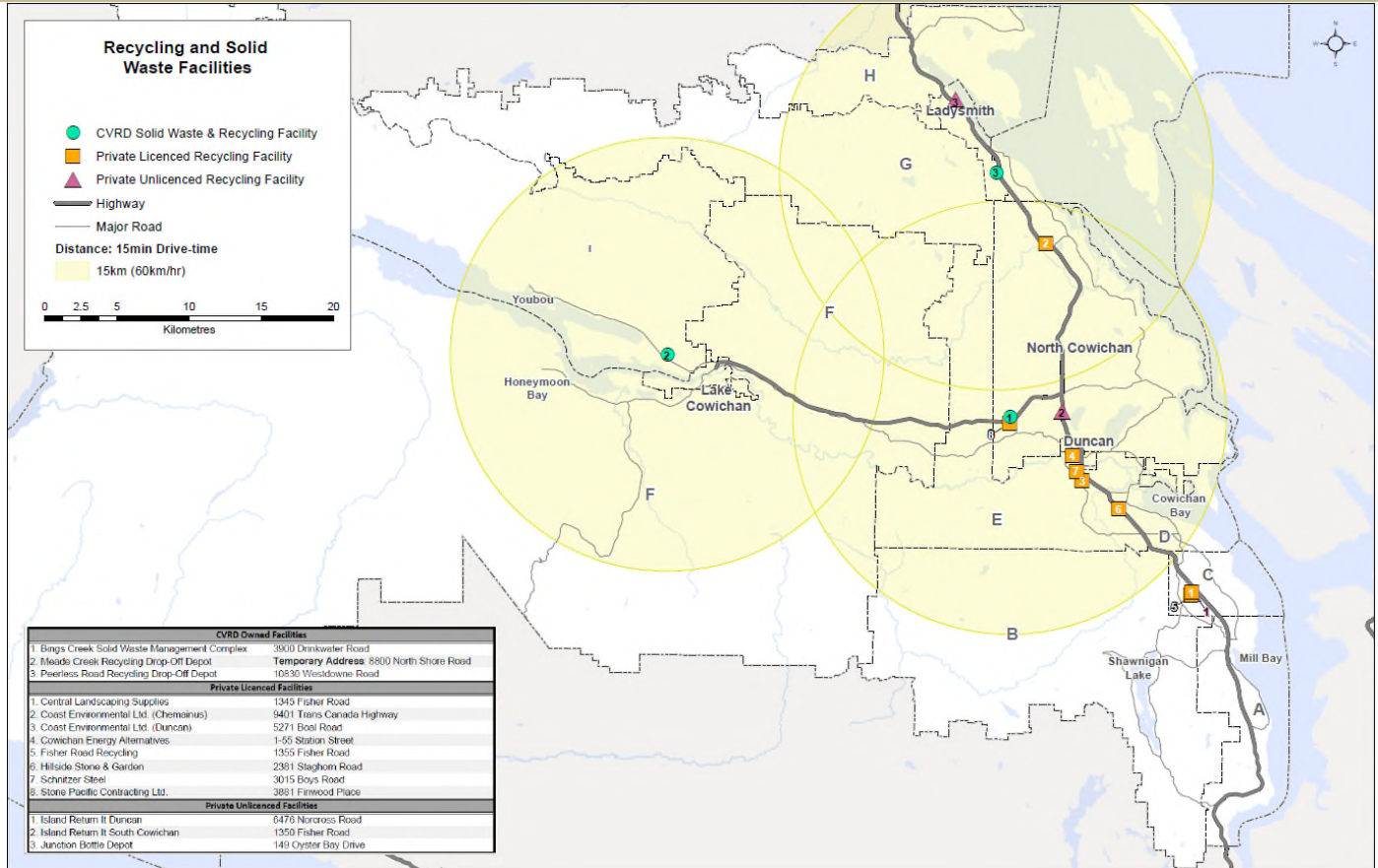
D-2

MAP 3: CURBSIDE COLLECTION SERVICES



D-3

Map 4: CVRD Recycling Centres



APPENDIX E

PLAN DISPUTE RESOLUTION PROCEDURES

PLAN DISPUTE RESOLUTION PROCEDURES

The parties will make all reasonable efforts to attempt to resolve the dispute in an amicable manner without outside intervention. The Ministry of Environment and Climate Change Strategy does not become involved in resolving or making a decision in a dispute.

This dispute resolution procedure may apply to the following types of conflicts:

- Administrative decisions made by CVRD staff
- Interpretation of a statement, bylaw, policy or provision in the plan
- The manner in which the plan or facility Operational Certificates are implemented
- Any other matter not related to a proposed change to the wording of the plan or Operational Certificate.

Collaborative Decision Making and Dispute Resolution Procedure

Negotiation	<ul style="list-style-type: none"> ▪ Parties involved in the dispute make all efforts to resolve the dispute on their own. ▪ Parties may make use of a facilitator
Plan Monitoring Working Group (if appropriate)	<ul style="list-style-type: none"> ▪ Parties involved in the dispute will have opportunity to speak to the group ▪ Group will review, consider and provide recommendations to the Board
Board	<ul style="list-style-type: none"> ▪ Parties involved in the dispute will have opportunity to speak to the Board ▪ Board will receive recommendations from the Working Group and settle the dispute; or, recommend mediation
Mediation	<ul style="list-style-type: none"> ▪ Parties involved in the dispute agree on a mediator. If the parties cannot agree on a mediator, the matter shall be referred to the BC Mediation Roster Society of equivalent roster organization for selection of a mediator ▪ All efforts will be made to reach an agreement throughout mediation ▪ Costs for mediation are shared by the parties in dispute
Independent Arbitrator	<ul style="list-style-type: none"> ▪ If the dispute cannot be resolved by a mediator, the matter will be referred to arbitration and the dispute will be arbitrated in accordance with the <i>Local Government Act</i> or <i>BC Commercial Arbitration Act</i> ▪ The arbitrator shall make a final, binding decision ▪ Costs for arbitration shall be apportioned at the discretion of the arbitrator

APPENDIX F

HISTORICAL LANDFILLS REPORT



Preliminary Investigation of Historical Landfill Sites in the CVRD



Prepared by:

Lindsey Haist, Environmental Technologist 1
Recycling and Waste Management Division
Cowichan Valley Regional District

October 17, 2016

Executive Summary

The purpose of this report is to summarize the preliminary investigations of historical landfill sites throughout the Cowichan Valley Regional District (CVRD). A map showing the location of historical landfills has been included in the Recycling and Waste Management Division's Solid Waste Management Plan (SWMP) since 1995. Investigations were performed to find location and ownership information for each location, and determine if additional steps towards site remediation is necessary. Research methods included conducting a search of the BC Site Registry database of contaminated sites, analyzing aerial photographs, gathering local knowledge through interviews and site visits, and searching newspaper archives. Of the 11 sites investigated, nine are confirmed to be historical landfill sites. Apart from Site 8 – Koksilah Landfill, none of the Sites were found to have been owned by the CVRD currently or in the past. No additional steps are deemed necessary in this investigation.

Summary of Preliminary Investigations into Historical Landfill Sites in the CVRD.				
	Site Name	Local Government Jurisdiction	Summary of Research Findings	Status / Next Steps
Confirmed Landfill Sites				
	Site 1 - Youbou	CVRD Electoral Area E	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity of Site 1.	Complete
	Site 2 - Honeymoon Bay	CVRD Electoral Area F	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity of Site 2.	Complete
	Site 3 - Ladysmith	Town of Ladysmith	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity of Site 3.	Complete
	Site 4 - Chemainus	Municipality of North Cowichan	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity of Site 4.	Complete
	Site 6 - N. Cowichan / Herd Road	Municipality of North Cowichan	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity of Site 6.	Complete
	Site 7 - Maple Bay	Municipality of North Cowichan	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity of Site 7.	Complete
	Site 8 - Koksilah	Cowichan Tribes/Crown Land	Site is currently being monitored and sampled by the CVRD.	Complete
	Site 9a/b –	CVRD Electoral Area B	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity	Complete

	Shawnigan Lake		of Site 9.	
	Site 11 – Lake Cowichan	CVRD Electoral Area F	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity of Site 11.	Complete
Unlikely Landfill Sites				
	Site 5 - Crofton	Municipality of North Cowichan	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity of Site 5; Municipality indicated landfill site did not exist at this location.	Complete
	Site 10 – Mill Bay	CVRD Electoral Area A	Investigation results did not reveal any CVRD owned potential dump site at or in the vicinity of Site 10.	Complete

Introduction

The Cowichan Valley Regional District's (CVRD) Recycling and Waste Management Division conducts work in accordance with the objectives and priorities outlined in the Division's Solid Waste Management Plan (SWMP)¹. Since the early 1990's, the SWMP has included a map and brief description of potential historical landfill sites (the 'Sites') throughout the region (see Appendix A). The SWMP commits that the Sites will 'receive rehabilitation or closure methods appropriate to the assessed environmental impairment' (1995). Little information is on record to indicate the source of the locations identified, ownership of the sites or the current status of these sites. As a result, CVRD staff has completed a limited Stage 1 Preliminary Site Investigation (PSI) of the sites referenced in the SWMP. The following labels were given to the Sites for the purpose of this investigation:

1. Site 1 - Youbou
2. Site 2 - Honeymoon Bay
3. Site 3 – Ladysmith
4. Site 4 – Chemainus
5. Site 5 – Crofton
6. Site 6 – Herd Road, North Cowichan
7. Site 7 – Maple Bay
8. Site 8 – Koksilah Landfill
9. Site 9 – Shawnigan Lake
10. Site 10 – Mill Bay
11. Site 11 – Lake Cowichan (Map #2)

Purpose

The purpose of this limited Stage 1 PSI for the above referenced sites is to:

1. Identify potential historical landfill locations (Sites) within CVRD;
2. Confirm the ownership of each identified Site (CVRD owned Sites);
3. Determine the current status of each identified Site.

This report summarizes the findings of this investigation.

Scope of Work

The scope of work for the limited Stage 1 PSI was completed in accordance with Section 58 of the Contaminated Sites Regulation B.C. Reg. 375/96 [includes amendments up to B.C. Reg. 286/2010, October 4, 2010 amendment] (CSR) and specifically included the following:

- Review of Solid Waste Management Plan maps for potential landfill locations (Sites);
- Review of historical investigation reports;
- Review of historical ownership records for evidence of activities or potential landfill locations;

¹ Solid Waste Management Plan (SWMP) (November 15, 1995), Cowichan Valley Regional District.

- Review of historical land titles records for ownership and relation to CVRD;
- Inspection of aerial photographs for indications of activities or land uses for potential landfill sites;
- Review of archived data, including newspaper and local museums;
- Inspection of the Sites and the surrounding areas to identify evidence and sources of possible contamination or environmental impairment;
- Interview individuals knowledgeable of location and history of the Sites;
- Preparation of a report describing the locations, ownership and status of the Sites referenced in the SWMP.

Limitations:

- These Sites do not include CVRD's historical incinerator sites;
- Identification of the potential contaminants of concerns based on historical use of the particular site is beyond the scope of this investigation.

Methodology

Review of Solid Waste Management Plan Maps

Two versions of the historical landfill map were reviewed in CVRD records. The first, *Map 1*, has been included in the SWMP since it was first released in 1995 (see Appendix A). The map shows 10 landfill sites throughout the region. The second, *Map 2*, was included in the Solid Waste Management Plan – Stage 1 report by Dayton & Knight Ltd. (1990) (see Appendix A). Map 2 also shows 10 landfill sites, however, Site 8 – Koksilah Landfill was not classified as an 'old landfill' as it was on Map 1 and an additional site, Site 11 – Lake Cowichan, was included as a potential historical landfill. For the purposes of this investigation, Map 1 was used to determine the location of the Sites as it is the most recent version.

Along with Map 1, the SWMP (1995) states that one of the Sites previously identified had been 'remediated to allow for development'. It is believed that the text is referring to Site 11 – Lake Cowichan, as it was the only Site excluded from the most recent version of the map. However, since the remediation of Site 11 – Lake Cowichan could not be confirmed it was included in the investigation.

Determine the Location of the Sites

The approximate locations of the historical landfill Sites are shown on Map 1 titled "Cowichan Valley Regional District Solid Waste Management Plan Existing Facilities and Abandoned Sites Figure 1". The symbols used to indicate the locations of the Sites are approximately 500m x 500m wide and the exact locations (coordinates, street addresses, etc.) are not provided.

To obtain precise Site locations, the symbols on the historical landfill maps were cross referenced with Google Maps to find their geographic coordinates (latitude and longitude). Nearby landmarks, such as roads and features along the shorelines were used to match the symbol with a location on Google Maps.

Once the location was found, a pin was added to the map to show the location and obtain the coordinates in Google Maps. These coordinates were used in the next stages of the investigation.

The points on the historical landfill map had been previously added as a layer into the CVRD's GIS mapping database. This tool was used to determine the local government jurisdiction of each location; however, the layer was created as a rough estimate of the Site locations and, therefore, was not used in this investigation.

BC Site Registry Search

BC Site Registry is an online database that allows users to access information retained by the BC government related to the environmental condition of land.

The coordinates found using Google Maps were entered into the BC Site Registry Search to determine if any information on the environmental condition of the properties was registered in that location or nearby. Initially, searches were set to within 1km² of the coordinates, and if no results were found, the search was expanded to 10km² searches. With the exception of Site 10 – Mill Bay, registered sites were found in the vicinity of each of the Sites.

Initial result included a Site ID, a date of last update and a street address of the registered site. Each street address was then searched using Google Maps and cross referenced with the pinned location of the historical landfill. Any address that was within approximately 3km of the location on Map 1 was identified as a potential match and a Synopsis Report was ordered from BC Site Registry.

The Synopsis Report provides site information including longitude and latitude, the date the site was registered, the number and type of activities that are part of the Site record (including landfilling in some cases), parcel descriptions and the status of the Site within the Ministry (i.e. Active – Remediation Complete, Active – Under Remediation, Inactive – No Further Action, etc.).

Synopsis Reports were ordered for seven of the sites.

Property Ownership Search

Since the exact location of each Site was unknown, each *potential* location was investigated to determine property ownership. Potential locations came from two sources: 1) The locations indicated on Map 1 and, 2) Sites identified as potential matches in the BC Site Registry. Therefore, ownership data was researched for two locations for the seven Sites with potential matches in the BC Site Registry.

For locations within the CVRD Electoral Areas, parcel identifier numbers (PIDs) were found using the CVRD's GIS mapping database. The PIDs were then sent to the CVRD Planning Department and ran through a land title search to determine current and previous owners.

For properties located within the boundaries of CVRD Municipalities, interviews were conducted including the respective local governments officials to obtain ownership information.

Interviews and Correspondence

Interviews were conducted with internal CVRD staff that might have knowledge of the location of historical landfill sites, especially in the Electoral Areas. An interview questionnaire was developed and shared with two staff members along with a map of the area where the location could be marked (see Appendix B for interview questionnaire example).

In addition, an inquiry into the sites located outside of CVRD Electoral Areas was made with staff at the Municipality of North Cowichan (MNC), the Town of Ladysmith and the Town of Lake Cowichan. MNC provided information on the four sites in their boundaries, including the location of the sites, their historical use as landfill sites, and current usage details. The Town of Ladysmith was able to provide ownership information related to the site registered in the BC Site Registry Database, and the Town of Lake Cowichan was not able to provide information on any of the Sites near that community.

Aerial Photographs:

A search of the Geo BC online aerial photograph database was conducted for all of the Sites to determine if physical indications of landfills (i.e. clearings, piles of materials, large disturbed areas) would be visible in historical photographs going back as far as 1992. However, results in this database were limited and only five of the Sites had corresponding photos. These images were used as reference only and not used to draw conclusions.

Newspaper Archives and Web Documents:

A search of archived newspaper articles and web documents was conducted using Google Search. Key words were used in the search related to the location of the Sites and words including, 'landfill', 'garbage', 'dump', etc. Both newspaper articles and online reports were found that made reference to historical landfill sites in the area.

The Cowichan Valley Museum and Archives

The Cowichan Valley Museum and Archives and the Malahat/Mill Bay Historical Society were also contacted as part of this search. Unfortunately, both of these organizations have limited resources and volunteers were not able to help within the timeframe of this research.

**On November 3, 2016 staff heard back from Pauline from the Malahat/Mill Bay Historical Society regarding Site 10. The organization expressed doubt that there was a landfill in the Kilmalu area, but suggested that there had been one in the Mill Springs area.*

Results

Site 1 - Youbou

The location of Site 1 – Youbou on Map 1 falls within 250m of a large clearing on the north side of Youbou Road. The results from the BC Site Registry show a registered site located on the south side of the road. This site is registered as a lumberyard and there is no indication that it was a landfill site. Interviews with residents from the area, Nicole Kaspar and Tara Daly, confirmed the location of the landfill to be in the clearing on the north side of the road. The current owner of this property is TimberWest Forest II Ltd. Land title records indicate that the previous owners of the property were also private forest companies. All other investigation results did not reveal any CVRD owned potential landfill sites at or in the vicinity of marked Site 1.

It is concluded that there is no CVRD owned potential landfill site in Youbou. Further investigation is not deemed necessary.

See Appendix C.1 for further information related to this Site.

Site 2 - Honeymoon Bay

Coordinates from Map 1 fall on a forested property west of Gordan River Road. Approximately 250m east is a site registered with BC Site Registry as 'Active/Under Assessment'. It is believed that this registered site is the location of the historical landfill and an interview and tour of the area with former CVRD Area Director, Joe Allen, confirmed this to be the location. The interview and a BC Land Title search confirmed the property is under private ownership and is not owned by the CVRD. All other investigation results did not reveal any CVRD owned potential landfill sites at or in the vicinity of marked Site 2.

It is concluded that there is no CVRD owned potential landfill site in Honeymoon Bay. Further investigation is not deemed necessary.

See Appendix C.2 for further information related to this Site.

Site 3 – Ladysmith

Coordinates from Map 1 fall onto a forested area approximately 120m south west of Heart Lake Trail. Research indicates that the potential landfill site is located further north than this location. The notes from the *Solid Waste Management Plan – Stage 1* report by Dayton & Knight Ltd. (1990) state that the landfill was located at Dogwood Drive and Holland Creek and that it has been capped. The location and closure of the landfill was further confirmed in the report by Parsley and Termes (2014)². Both the location marked on Map 1 and the Dogwood Drive locations are within the Town of Ladysmith boundaries. All other investigation results did not reveal any CVRD owned potential landfill sites at or in the vicinity of marked Site 3.

² Parsley and Termes (2014), *Archaeological Overview Assessment of a Proposed 69 ha. Residential Development at DL 103, Holland Creek, xwsóokw'em, Ladysmith BC*

It is concluded that there is no CVRD owned potential landfill site in Ladysmith. Further investigation is not deemed necessary.

See Appendix C.3 for further information related to this Site.

Site 4 – Chemainus

The location on Map 1 does not coordinate with a property showing evidence of a potential landfill site. Two nearby sites are registered with BC Site Registry, however, these are both active industrial sites owned by Chemainus Park Holdings with the status of 'Soil Received'. These properties are not believed to be the locations of a historical landfill.

Correspondence with the Municipality of North Cowichan indicates that in the past garbage was dumped at a site along River Road, 350m from the map location. It is believed that this is the landfill referred to in the SWMP. This location is owned by the Municipality of North Cowichan and actively used as a gravel pit and dump site for clean fill. No indication was made by the Municipality that this site is being remediated. All other investigation results did not reveal any CVRD owned potential landfill sites at or in the vicinity of marked Site 4.

It is concluded that there is no CVRD owned potential landfill site in Chemainus. Further investigation is not deemed necessary.

See Appendix C.4 for further information related to this Site.

Site 5 – Crofton, North Cowichan

The location on Map 1 lands on a forested area between Osborne Bay Road and Crofton Lake. The only site registered with BC Site Registry within 3km of this location is not believed to be the historical landfill site as it is a water lot (owned by Crown Provincial). Correspondence with the Municipality of North Cowichan suggests that the roads between Osborne Bay Road and Crofton Lake were never used as a landfill site. Currently, this area is owned by the Municipality of North Cowichan. No other information about this Site was found. All other investigation results did not reveal any CVRD owned potential landfill sites at or in the vicinity of marked Site 5.

It is concluded that there is no CVRD owned potential landfill site in Crofton. Further investigation is not deemed necessary.

See Appendix C.5 for further information related to this Site.

Site 6 –Herd Road, North Cowichan

The location on Map 1 does not coordinate with any sites in the BC Site Registry database for this area. The *Solid Waste Management Plan – Stage 1* report by Dayton & Knight Ltd. (1990) states that 'this site comprises of 2.4ha and served for disposal of both residue from incinerator and for solid waste. Site is owned by District of North Cowichan. Fill depth is reported to be about 6m. Closed in 1977. Incinerator operated from 1970 to 1977.' Newspaper articles confirm the existence of this incinerator and

correspondence with staff at the Municipality of North Cowichan indicates the location was at Herd Road and Richards Creek. The property is owned by the Municipality of North Cowichan and is currently used as a dump site for clean fill. All other investigation results did not reveal any CVRD owned potential landfill sites at or in the vicinity of marked Site 6.

It is concluded that there is no CVRD owned potential landfill site on Herd Road. Further investigation is not deemed necessary.

See Appendix C.6 for further information related to this Site.

Site 7 – Maple Bay, North Cowichan

The location marked on Map 1 lines up with a cleared area behind the Maple Bay Fire Hall in the Municipality of North Cowichan. There were no potential matches for this Site in the BC Site Registry database, however, correspondence with the Municipality of North Cowichan confirms that there was a garbage dump site at the location indicated on Map 1. The property is currently used as a gravel pit by the Municipality. No indication was made by the Municipality that this site is being remediated. All other investigation results did not reveal any CVRD owned potential landfill sites at or in the vicinity of marked Site 7.

It is concluded that there is no CVRD owned potential landfill site in Maple Bay. Further investigation is not deemed necessary.

See Appendix C.7 for further information related to this Site.

Site 8 – Koksilah Landfill

The Koksilah Landfill is located on the Cowichan Indian Reserve, approximately 2.5 km south of Duncan and 200m northwest of the Koksilah River. Municipal Solid Waste (MSW) was landfilled on the site for approximately 40 years, and the waste footprint covers an area of approximately 3.7 ha. The site was operated by the City of Duncan from 1959 to 1973, when it was taken over by CVRD and permitted by the B.C. Ministry of Environment. It was operated until 1997 and in 1998 the Koksilah Road landfill was deemed full and no further municipal solid waste was received at the site.

As per Ministry of Environment requirements, the CVRD retains responsibility for the long-term monitoring and maintenance of the Koksilah Road landfill. This includes regular monitoring of ground and surface water for flow direction and potential leachate contamination, as well as the maintenance of the landfill access road, perimeter fencing, the geosynthetic cap and liner.

Item	Pertinent Findings
<i>Site 8</i>	
Registered Owner	Cowichan Tribes
Location (Lat/Long, civic address, etc.)	48°45'17.1"N 123°41'28.1"W 4990 Koksilah Road, Duncan City of Duncan

Item	Pertinent Findings
Site Historical Use	Landfill for Municipal Solid Waste
Current Status	CVRD staff conducting ongoing environmental monitoring

It is concluded that this Site should not be considered under the liability list of potential landfill or a dump site.

Site 9a/b – Shawnigan Lake

The investigation resulted in identification of two (2) separate sites.

The location of Site 9(a) on Map 1 lines up with a clearing north of Malta Road in Shawnigan Lake. This location matches the description in the *Solid Waste Management Plan – Stage 1* report by Dayton & Knight Ltd. (1990), which states the Site is ‘located on Crown land at end of Malta Rd at north end of Lake. Site is about 1-2 hectare in size. Operated by Shawnigan Improvement District, this Site was used for open burning.’

Results from the BC Site Registry Database list a ‘Shawnigan Lake Landfill Site’ (BC Site Registry Site ID 1927) but do not list the location. When the Synopsis Report for this Site was reviewed, it was found that the Site was consolidated with BC Site Registry Site ID 6672 (mislabelled on the Synopsis Report as 6627), which is located approximately 1km southwest of the Malta Road location. This Site, referred to as 9b, is located at the 2800 block of Shawnigan Lake Road. It is owned by Shawnigan Station Developments Ltd. and registered as ‘Active – Under Remediation’.

The BC Site Registry and SWMP description confirm location of 9a. Site 9a was consolidated with 9b and is registered as ‘Active – Under Remediation’; CVRD not listed as previous owner of either properties. Further investigation is not required.

See Appendix C.8 for further information related to this Site.

Site 10 – Mill Bay

Coordinates from Map 1 do not line up with a property showing evidence of a historical landfill site, based on analysis of aerial photographs and Google imagery of the area. There were no potential matches found in the BC Site Registry and information was not found in newspaper archives or on aerial photographs. The Malahat/Mill Bay Historical Society was contacted as part of the research for this Site, however, no response was received.

It is concluded that, unless information about the Site is reported, further investigation is not required.

**On November 3, 2016 staff heard back from Pauline from the Malahat/Mill Bay Historical Society regarding Site 10. The organization expressed doubt that there was a landfill in the Kilmalu area, but suggested that there had been one in the Mill Springs area.*

Site 11 – Lake Cowichan

Coordinates from Map 1 do not line up with a property showing evidence of a landfill site or a site registered in the BC Site Registry. However, results from the BC Site Registry database suggest a likely match located approximately 500m southeast from the mapped location on 10142 South Shore Road. This Site is classified as 'Inactive – No Further Action'. Both the description in the SWMP (1990) and interviews with CVRD staff member Tara Daly and former CVRD Area F Director Joe Allen confirm the location to be on South Shore Road. TimberWest Forest II currently owns the property.

Site 11 was included in the 1990 version of the map but not in the 1995 version. The 1995 SWMP mentions that one of the sites was remediated for development (Page 4-8) and it is believed that the report is referring to Site 11. All other investigation results did not reveal any CVRD owned potential landfill sites at or in the vicinity of marked Site 11.

It is concluded that there is no CVRD owned potential landfill site in Lake Cowichan. Further investigation is not deemed necessary.

See Appendix C.9 for further information related to this Site.

Conclusion

Location and ownership information was confirmed for 10 of the 11 Sites investigated. Of those 10 Sites, nine were confirmed to be historical landfill sites. Of those nine Sites, four are located in CVRD Member Municipalities and one, the Koksilah Landfill, is located on Crown Land (Cowichan Tribes). Sites 1 – Youbou, Site 2 – Honeymoon Bay, Site 9a/b – Shawnigan Lake and Site 11 – Lake Cowichan are located within CVRD Electoral Area boundaries, however the CVRD was not listed as the current or previous owner of any of these Sites in the land title search.

Two of the Sites, Site 5 – Crofton and Site 9 – Mill Bay were found to be unlikely locations of historical landfill sites, as information was not found to confirm their existence. Unless further information is reported, the investigation for these Sites is deemed complete.

Although the CVRD does not have ownership of the historical landfills identified in this investigation, the research conducted led to a more precise understanding of the location of historical landfill sites in the region. Figure 1 below summarizes the location of historical landfill sites in the region based on this research. The coordinates and local government are also included for each.

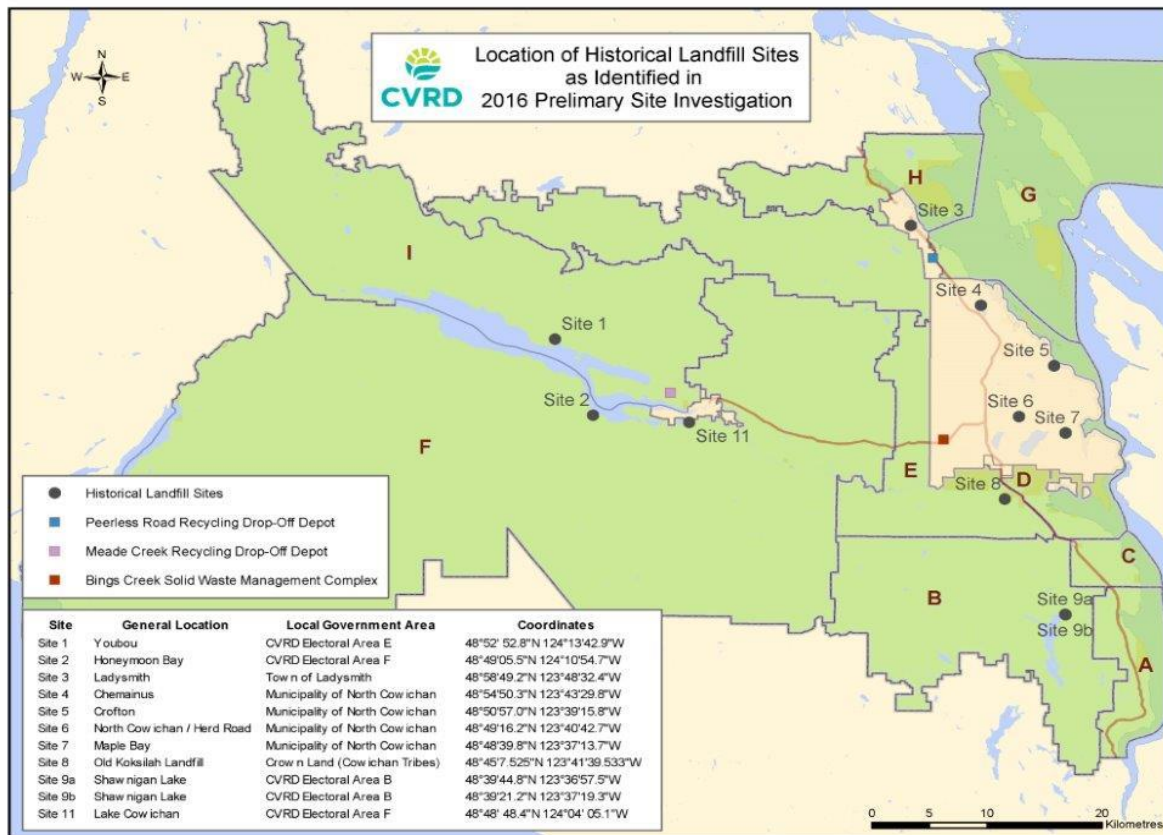
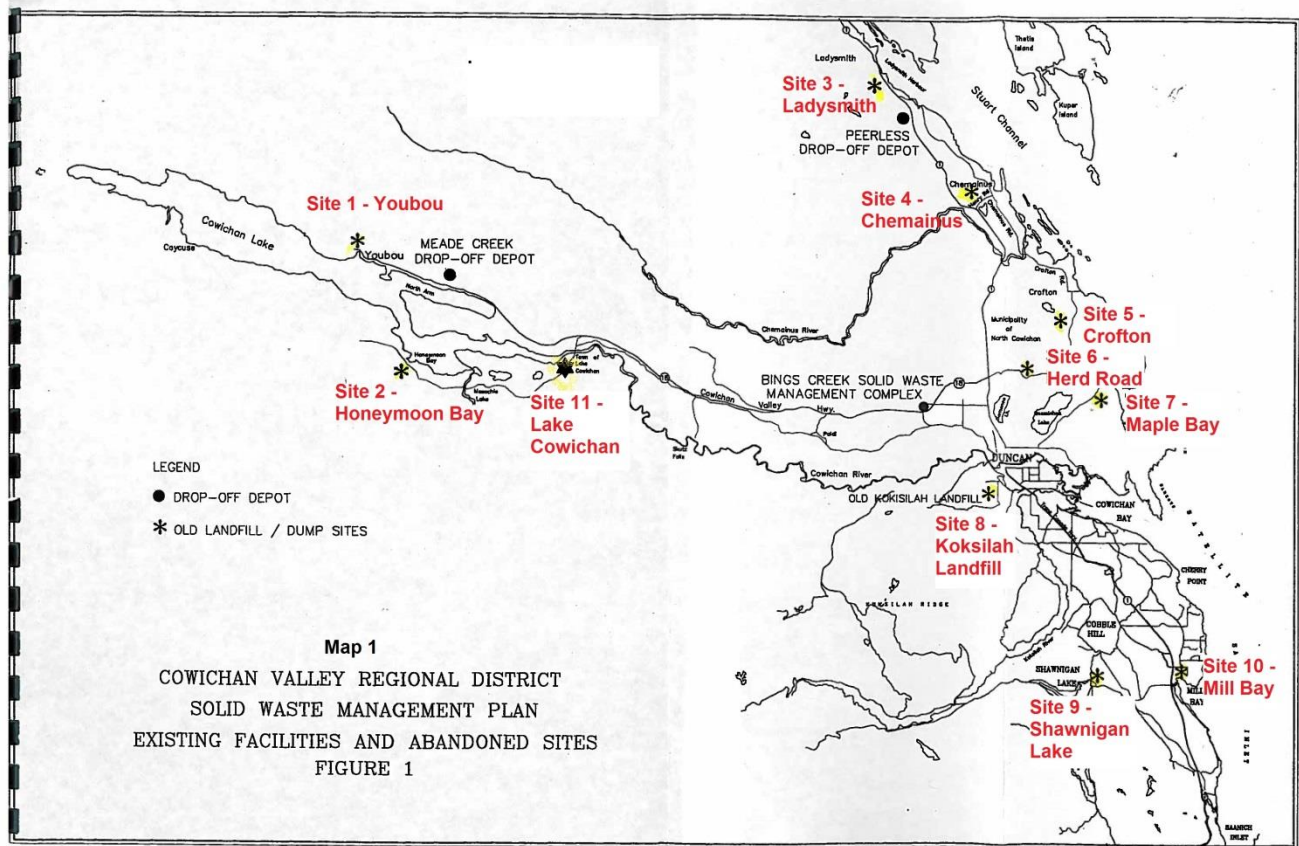


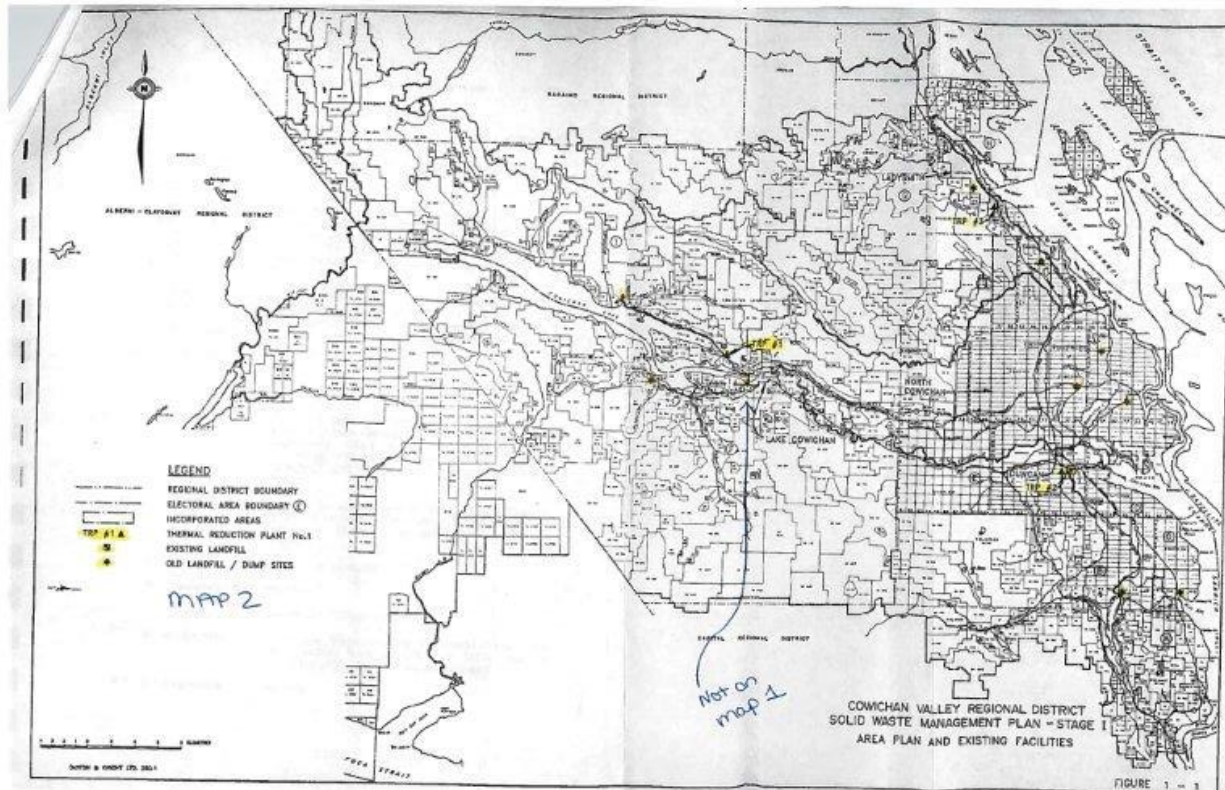
Figure 1: The location of historical landfill sites as identified in the 2016 preliminary site investigation.

Appendix

Appendix A



Map 1 showing the locations of historical landfill sites as found in the CVRD's SWMP (1995), with Site 11 – Lake Cowichan added (not included in original Map 1, however, carried over for this investigation from Map 2)



Map 2 was included in the Solid Waste Management Plan – Stage 1 report by Dayton & Knight Ltd. (1990). Included Site 11 – Lake Cowichan.

Appendix B

Date of Interview	September 14, 2016
Interviewer Name	Lindsey Haist
Person to be Interviewed	
Location of Interview	CVRD Ingram Office
Historical Landfill Site	

Interview Questions

1) What is your knowledge of the historical landfill site(s)?	
2) What is the approximate location of the site(s)? Please indicate on map if possible.	
3) What do you know about the ownership of the site?	
4) What do you know about the material accepted at the site?	
5) What do you know about the duration the site was open?	
6) When did the site close?	
7) What is the site used for currently?	

Appendix C

Appendix C.1

As of: JUN 19, 2016 BC Online: Site Registry 16/06/24
 For: PB68383 COWICHAN VALLEY REGIONAL DIST. (ACCN 16:26:44
 Folio: Page 1
 1 records selected for 5.0 km from latitude 48 deg, 52 min, 50.4 sec
 and Longitude 124 deg, 13 min, 41.7 sec
 Site Id Lastupd Address / City
 0007242 15AUG21 COWICHAN LUMBERMILL
 YOUNBOU

Site # 1 - Youbou

Date of Interview	September 14, 2016
Interviewer Name	Lindsey Haist
Person to be Interviewed	Nicole Kaspar
Location of Interview	CVRD Ingram Office

Interview Questions

1) What is your knowledge of historical dump site?	was used as a landfill for several years
2) What is the approximate location of the site?	See attached map
3) What do you know about the ownership of the site?	BC Forest Products + possibly Timber West in later years
4) What do you know about the material accepted at the site?	Anything + everything was accepted it was "free" (charged to taxpayers)
5) What do you know about the duration the site was open?	Unknown
6) When did the site close?	when Meade creek opened (Incinerator)
7) What is the site used for currently?	Nothing that I know of



Map to accompany interview with Nicole Kaspar. 'X' indicates approximate location of old Youbou landfill.

Date of Interview	September 14, 2016
Interviewer Name	Lindsey Haist
Person to be Interviewed	TARA DAILY
Location of Interview	CVRD Ingram Office

* Youbou Site #1* LAKE COWICHAN SITE 11

Interview Questions

	<u>Youbou</u>	<u>Honeymoon Bay</u>
1) What is your knowledge of historical dump site?	Suspect it existed from the 40s to the 80s - in later years used for yard, garden and wood waste	been offered to take garbage so we could see the bears and drive through town!
2) What is the approximate location of the site?	approx 1 km past the end of pavement at west end of Youbou	approx 1 km west of town, on south side of road on a large corner just past CLEC entrance on north side
3) What do you know about the ownership of the site?	saw mill owners 4 last ones were TimberWest 4 now (I think) the owners of "Youbou Lands"	nothing
4) What do you know about the material accepted at the site?	originally garbage then #1	garbage dump for Lake Cowichan
5) What do you know about the duration the site was open?	#1 used less for garbage after incinerators opened	not sure, but suspect 40s to 80s
6) When did the site close?	mid 80s?	mid 80s
7) What is the site used for currently?	haven't been there lately but suspect yard, garden and wood waste	I don't think anything

Appendix C.2

As of: JUN 26, 2016	BC Online: Site Registry	16-06-27
Folio:	For: PB68383 COWICHAN VALLEY REGIONAL DIST. (ACC	10:11:45
		Page 1
Synopsis Report		
SITE LOCATION		
Site ID: 1836	Latitude: 48d 49m 03.8s	
Victoria File:	Longitude: 124d 10m 50.9s	
Regional File: 26250-20/1836		
Region: NANAIMO, VANCOUVER ISLAND		
Common Name:		
Site Address: 10142 SOUTH SHORE ROAD		
City: HONEYMOON BAY	Prov/State: BC	
Postal Code:		
Registered: OCT 29, 1997 Updated: DEC 19, 2001 Detail Removed: DEC 06, 2001		
Notations: 2	Participants: 11	Associated Sites: 1
Documents: 3	Susp. Land Use: 2	Parcel Descriptions: 3
Location Description: LOCATION DERIVED FROM GPS PROJECT ENVIC RVR #P102420C		
Status: ACTIVE - UNDER ASSESSMENT		
Fee category: UNRANKED		
No Site Profile has been submitted for this site		
End of Synopsis Report		

Date of Interview	Oct 21 - 2016
Interviewer Name	Lindsey Haist
Person to be Interviewed	Joe Allen
Location of Interview	Gravel pit/forested area Visit to Sites
Historical Landfill Site	Site 2 - Horeymson Bay Site 11 - Lake Cowichan

*confirmed locations
identified in research

Interview Questions

	Site #2	Site #11
1) What is your knowledge of the historical landfill site(s)?	• Used to go to dump as teenager + dump garbage; known owners of property over the years.	• same as site #2
2) What is the approximate location of the site(s)? Please indicate on map if possible.	see attached.	
3) What do you know about the ownership of the site?	Was owned by "Dave Joels", went bankrupt, now owned by bank	Owned by private forest company - run by Lake Cowichan previously
4) What do you know about the material accepted at the site?	Municipal solid waste initially; industrial + wood waste, cars, everything, later	household, metal, everything
5) What do you know about the duration the site was open?	unknown	unknown
6) When did the site close?	unknown	unknown
7) What is the site used for currently?	Gravel pit/forested area	Logged area/forested.



Appendix C.3

this forested area. Arthur Jim relates (2014 pers. comm., 4 June) that the Holland Creek system was used for the transport of animal carcasses, where they would be carried by the flowing water down the creek to the beach for butchering. Elmer Sampson reiterates this by stating, "<Peter Seymour the chief>...He used to come visit my dada and they were talking about hunting, they use(d) to go across that Holland creek next to Safeway there, they walk along the creek, go up the mountain. He said when he got a deer he'd come along the creek and go in the water, pack it, (IA) it down the river" (HTG:3). Elmer Sampson highlighted this location as an animal procurement and carcass transport on an HTG map as Holland Creek, south of the creek and surrounding land. Shell Beach resident Mr. Alfred Louie recalled his father and grandfather hunting bears, deer, grouse, pheasant and quail, "...where Ladysmith is now" (Johnson-Cull 1980:293).

Historic

Early settlers of Ladysmith recall hiking to the dam, Arbutus Hump, and further to Stocking Lake (Johnson-Cull 1980:334). The dam referred to, is a colliery dams (fig. 10) constructed, c.1900 for supplying the coal washer at Transfer Beach (Ladysmith Parks and Recreation) and was revisited during the pedestrian survey (figure 8). Outside of the property boundaries to the south and west are numerous historical archaeological sites. See Muralt (1994) for thorough documentation of the various historical activities such as logging camps, and tracks.

Aside from recreation and industry, Holland Creek Park was the preferred location for refuse dumping. Where present Dogwood Drive bridge spans Holland Creek, residents used this steep creek slope as a city dump until the 1950s or 1960s (Ladysmith Archives 2014, pers. comm., 26 May). A local old timer told Arthur Jim (2014 pers. comm., 21 May) that aboriginal skeletons unearthed during mill expansion were dumped at this location with the rest of the town garbage. This area has since been capped, and no dump exposures or human remains were visible during the site visit.

Early aerial photos of the subject property were sought in order to identify whether any areas of old growth were present in the study area in order to target these zones during the pedestrian survey. Referred to in Muralt's work to record the rail-era logging features in the area, these photos were sought out by calling the predecessor office now responsible for the Duncan area where we discovered that during the closure of the Duncan Forest District office, one employee saved all of the air photos and received permission to store them in the Cobble Hill Forestry Fire Centre. Several air photos of the study area were reviewed. It is estimated they date from the 1960's and indicated that the area had been previously entirely logged over (figure 4).

*Excerpt from Page 12 of Parsley and Termes (2014), *Archaeological Overview Assessment of a Proposed 69 ha. Residential Development at DL 103, Holland Creek, xwsókw'em, Ladysmith BC*

- A small tracked vehicle equipped with a blade is used for spreading and compaction.
- Hog fuel is used for site access and cover material.
- Other than the entrance, the site is screened by trees which catch blowing debris.
- No water courses were noted entering or exiting the site.

3.4.2 Ashfills

Each TRP has an ashfill located adjacent to the incinerator facility. The ashfill is regulated under the Permit issued for the TRP. When observed in June 1989 the ash contained some partially combusted material and no cover material was being applied in the ashfill. The Permit stipulates once per week covering at TRP No. 1 and covering each 14 days at TRP Nos. 2 and 3.

A sample of ashfill was analyzed in June 1989 in accordance with the Special Waste extraction procedure. Lead at 9.77 mg/L was higher than the maximum allowable concentration of 5.0 mg/L used to categorize a special waste. The WMB has classified the ash as a Special Waste.

3.4.3 Old Landfills

A review of reports (Appendix 1) identifies old landfill sites. The locations are shown on Figure 1 and a brief description follows.

- | | |
|-------------------|--|
| 1) Herd Road | This site comprises about 2.4 ha and served for disposal of both residue from an incinerator and for solid waste. Site is owned by the District of North Cowichan. Fill depth is reported to be about 6 m. Closed in 1977. Incinerator operated from 1970 to 1977. |
| 2) Shawnigan Lake | Located on Crown land at end of Malta Road at north end of Lake. Site is about 1-2 ha. Open burn operation. Operated by Shawnigan Improvement District. |
| 3) Lake Cowichan | Located on South Shore Road. |
| 4) Honeymoon Bay | No data. |
| 5) Youbou | Owned by B.C. Forest Company. |
| 6) Ladysmith | Located on Dogwood Drive at Holland Creek. This site operated from the 1920s or 1930s until its closure in 1968. The site has been capped. |
| 7) Chemainus | No data. |

*Excerpt from Page 3-19 of the Solid Waste Management Plan – Stage 1 report by Dayton & Knight Ltd. (1990).

Appendix C.4

As of: JUN 26, 2016	BC Online: Site Registry	16-06-27
Folio:	For: PB68383 COWICHAN VALLEY REGIONAL DIST. (ACC	13:39:18
		Page 1
Synopsis Report		
SITE LOCATION		
Site ID: 7265	Latitude: 48d 54m 40.0s	
Victoria File: 26250-20/7265	Longitude: 123d 44m 10.0s	
Regional File: 26250-20/7265		
Region: NANAIMO, VANCOUVER ISLAND		
Common Name:		
Site Address: 9401 TRANS CANADA		
City: CHEMAINUS	Prov/State: BC	
Postal Code: V0R 1K4		
Registered: JUN 15, 2001 Updated: MAR 15, 2012 Detail Removed: MAR 13, 2012		
Notations: 0	Participants: 0	Associated Sites: 0
Documents: 0	Susp. Land Use: 0	Parcel Descriptions: 2
Status: SOIL RECEIVED		
Fee category: UNRANKED		
No Site Profile has been submitted for this site		
End of Synopsis Report		

RE: Landfill Sites

Shaun Chadburn <shaun.chadburn@northcowichan.ca>

You forwarded this message on 10/7/2016 2:51 PM.

Sent: Thu 10/6/2016 3:39 PM
To: Lindsey Haist

Ok I had a chat with our old Director of Engineering and our current operations manager (both have worked for north Cowichan for over 30 years) - notes below:

Site #7 –Currently a MNC gravel pit behind new maple bay fire hall - Old garbage dump

Site #6 – Old incinerator site along Richards Creek- Still used as an MNC Dump for clean fill from ditch lines etc.

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Site #4 – Currently MNC gravel pit on river road (dump for lean fill as well) was a garbage dump in the past.

If you have further questions, our Operations manager Chris Graham might have more specific information.

Hope this helps.

Shaun Chadburn
Engineering Technologist (Environmental Programs)
ENGINEERING & OPERATIONS

Municipality of North Cowichan
7030 Trans-Canada Highway | Box 278
Duncan, BC V9L 3X4 | Canada
www.northcowichan.ca
Shaun.Chadburn@northcowichan.ca
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Appendix C.5

As of: JUN 26, 2016	BC online: Site Registry	16-06-27
Folio:	For: PB68383 COWICHAN VALLEY REGIONAL DIST. (ACC	15:46:00
		Page 1
Synopsis Report		
SITE LOCATION		
Site ID: 10696	Latitude: 48d 51m 50.0s	
Victoria File: 26250-20/10696	Longitude: 123d 38m 15.0s	
Regional File:		
Region: NANAIMO, VANCOUVER ISLAND		
Common Name:		
Site Address: OSBORNE BAY		
City: CROFTON	Prov/State: BC	
Postal Code:		
Registered: DEC 07, 2007 Updated: JAN 18, 2008 Detail Removed: JAN 10, 2008		
Notations: 1	Participants: 2	Associated Sites: 0
Documents: 0	Susp. Land Use: 0	Parcel Descriptions: 0
Location Description: WATER LOTS 256; 171 (BLOCK C AND D); 54 FOR SECTION 1, RANGE 11, CHEMAINUS DISTRICT		
Status: ACTIVE - UNDER ASSESSMENT		
Fee category: UNRANKED		
No Site Profile has been submitted for this site		
End of Synopsis Report		

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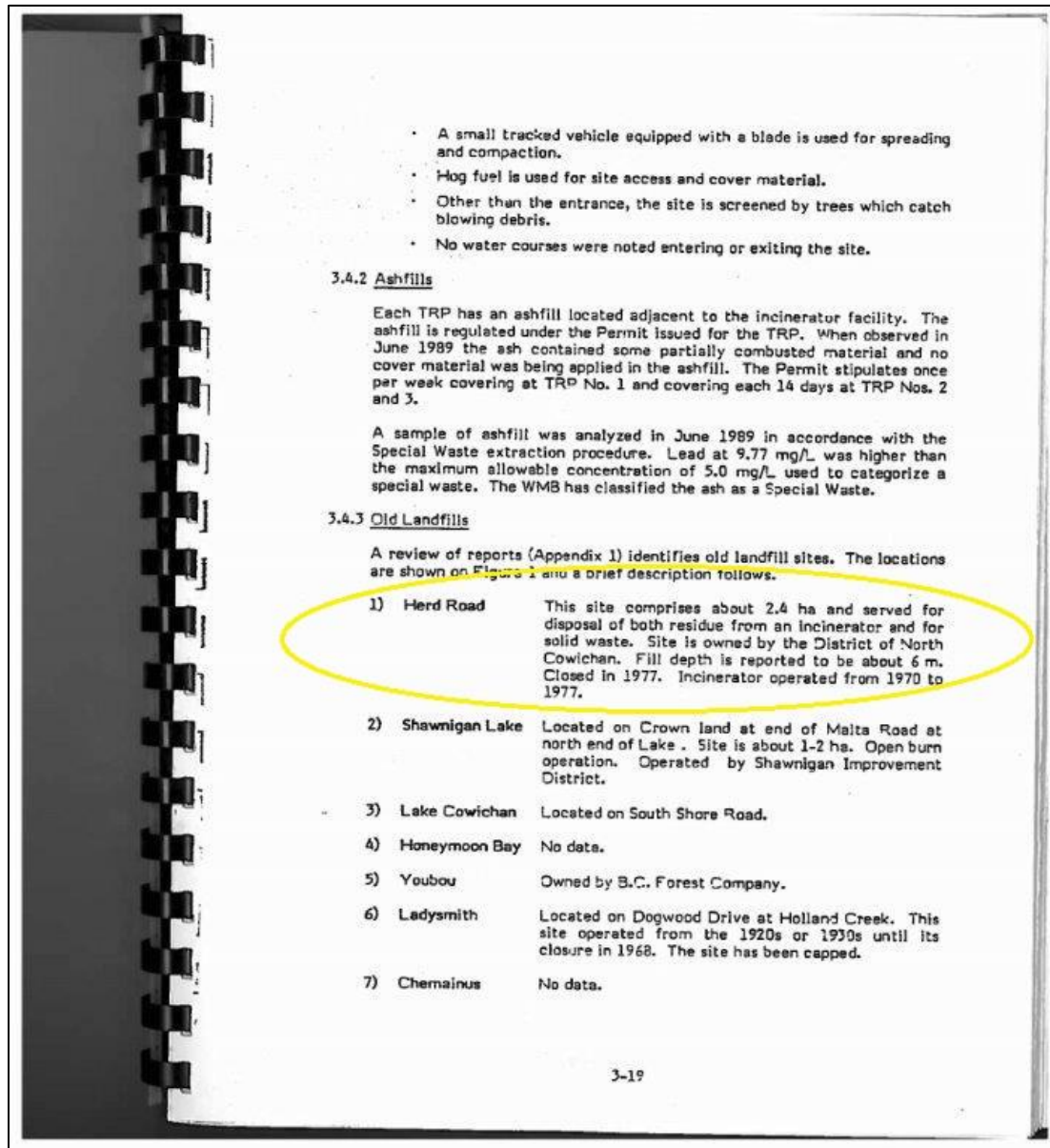
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Appendix C.6



Waste disposal site?

North Cowichan council is considering putting a solid waste disposal site in its new Smiley Road industrial park.

North Cowichan alternate director Birgitte Meagher told the Cowichan Valley Regional District board, August 9, that the Chemainus site would have the advantage of "being available, and being available fast" should regional waste disposal plans be further delayed.

North Cowichan's permit to operate its Herd Road incinerator expires at the end of the year.

Both Meagher and North Cowichan director Rex Hollett suggested the CVRD might consider using the municipally-owned Smiley Road site as a regional waste disposal site should the proposed regional Koksilah site be unavailable.

Negotiations are presently underway with the Cowichan Indians for the use of the Koksilah site.

"We've got to get something going," said Hollett.

Administrator Ralph Keir said that a site on Smiley Road, to serve the CVRD's south end, would be too close to the proposed Peerless Road site which would serve the north end.

Keir added that the CVRD has still not received word whether the Pollution Control Branch will require a third public hearing on the Peerless Road site.

The CVRD board also decided to ask its public works superintendent to suggest a list of dumping restrictions for the present Koksilah Road site.

Superintendent Dennis Leeman had reported that the Duncan and south landfill site on Koksilah Road had been filling up faster than usual and estimated its life expectancy at eight months.

Leeman wrote that the

Wednesday, Aug. 16, 1978- LADYSMITH-CHEMAINUS CHRONICLE-13

CHRONICLE

SECOND SECTION

GIVE YOUR ADDRESS ON EMERGENCY CALL



BILL GROUHEL
...lucky this time

The telephone operator in Nanaimo plugged into the circuit and heard a frantic voice screaming at her, "My house is on fire..." Then the caller hung up.

This sort of thing happens more often than the public realizes and the pity of it is that no one can help the caller.

It occurred again recently, and the call was from the Ladysmith exchange. It happened that an alert operator held a key down, thereby maintaining the circuit even though the caller had hung up. It happened also that John Wilson, who works for B.C. Tel and who is also a Ladysmith volunteer fireman, and two other B.C. Tel employees, were in the Ladysmith telephone office at the time of the call, so when the operator called them they were able to quickly locate the call.

"Don't hang up; give a complete message." This is the advice of Ladysmith Fire Chief Bill Grouhel.

Industrial site draws company

Borrow Forest Industries, a subsidiary of Port Renfrew Shake and Shingle Ltd., is buying four acres of land in North Cowichan's industrial park in Chemainus.

Finance chairman Dennis Hogan told council, August 3, that the company had put down a deposit of \$10,000 on the Smiley Road acreage.

Alderman Graham Bruce, chairman of the economic development committee, said the owner should be taking possession August 31.

"I'm very pleased," said Bruce, whose committee has been working to bring industry into the municipality.

Borrow Industries president Reginald Borrow told The Chronicle Friday

Keep your carpets clean

with

ARGOSHEEN

Why is ARGOSHEEN...
Better Than Shampoo

Shampoo drives the dirt to the bottom of the carpet where it stays. Thus, causing SOIL BUILD-UP. Carpets become hard and matted - the same as your hair would if you left the shampoo on it.

ARGOSHEEN

breaks down dirt - soil - and even shampoo and floats dirt to the top where it is wiped off with a damp mop.



Can you smile when tar is tracked on your new carpets or when the children and friends spill their drinks and food? You can! Thousands of women, hotel & motel chains, schools,

RE: Landfill Sites

Shaun Chadburn <shaun.chadburn@northcowichan.ca>

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Sent: Thu 10/6/2016 3:39 PM

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Appendix C.7

RE: Landfill Sites

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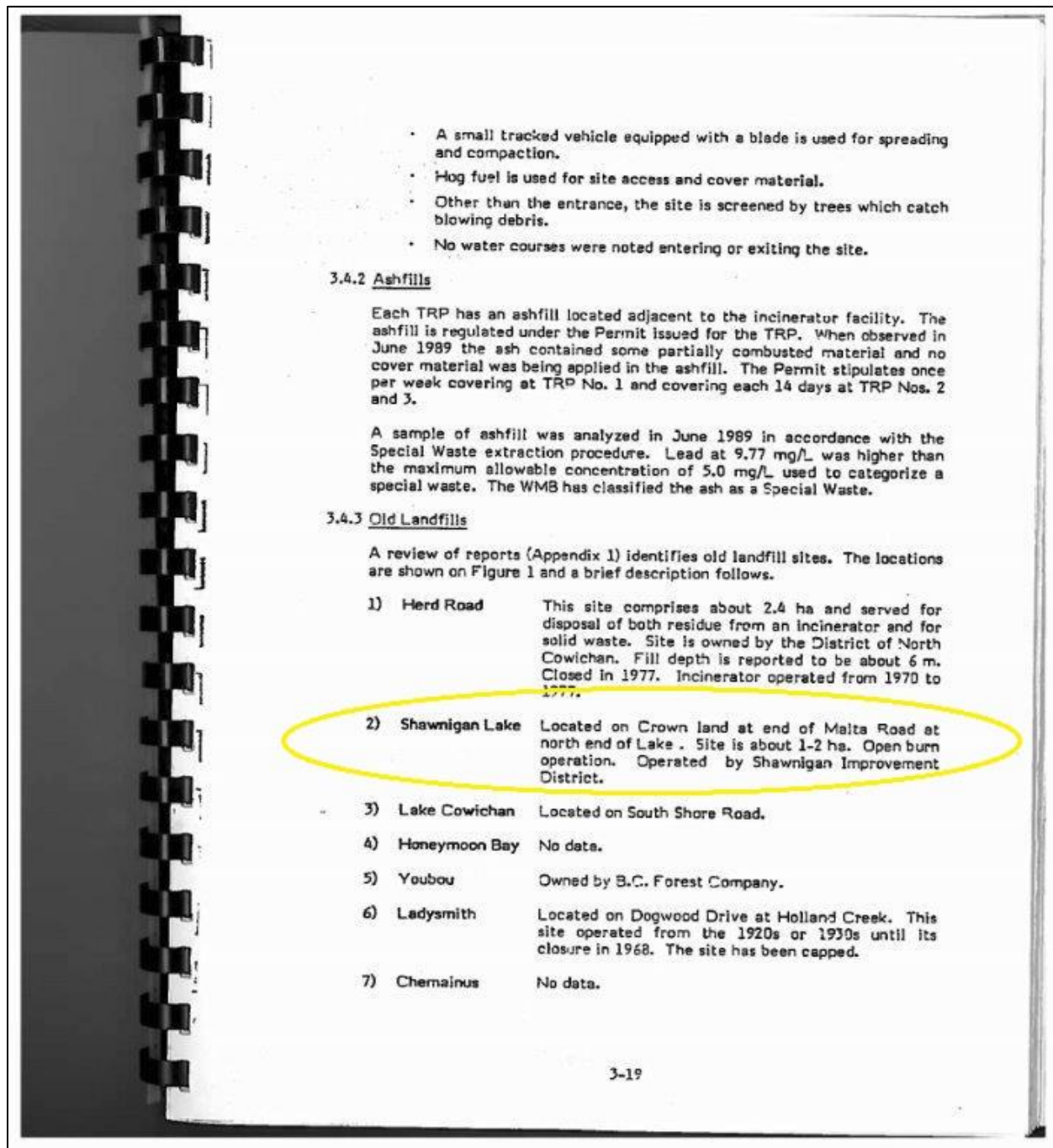
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Appendix C.8



As of: OCT 02, 2016	BC Online: Site Registry	16-10-03
Folio:	For: PB68383 COWICHAN VALLEY REGIONAL DIST. (ACC 10:33:19	Page 1
Synopsis Report		
SITE LOCATION		
Site ID: 1927	Latitude: 48d 39m 21.2s	
Victoria File: 26250-20/1927	Longitude: 123d 37m 19.3s	
Regional File: 26250-20/1927		
Region: NANAIMO, VANCOUVER ISLAND		
Common Name:		
Site Address: SHAWNIGAN LAKE LANDFILL SITE		
City: SHAWNIGAN LAKE	Prov/State: BC	
Postal Code:		
Registered: OCT 22, 1999 updated: MAR 24, 2016 Detail Removed: MAR 23, 2016		
Notations: 2	Participants: 2	Associated Sites: 1
Documents: 0	Susp. Land Use: 0	Parcel Descriptions: 10
Location Description: SITE 1927 HAS BEEN CONSOLIDATED WITH SITE 6627. SITE 1927 WILL NOT BE USED.		
Status: ACTIVE - UNDER REMEDIATION		
Fee category: UNRANKED		
No Site Profile has been submitted for this site		
End of Synopsis Report		

As of: JUN 26, 2016	BC Online: Site Registry	16-06-29
Folio:	For: PB68383 COWICHAN VALLEY REGIONAL DIST. (ACC	11:56:48
		Page 1

Synopsis Report

SITE LOCATION

Site ID: 6672	Latitude: 48d 39m 20.0s
Victoria File: 26250-20/6672	Longitude: 123d 37m 17.0s
Regional File: 26250-20/6672	
Region: NANAIMO, VANCOUVER ISLAND	

Common Name:

Site Address: 2800 BLOCK SHAWNIGAN LAKE ROAD

City: SHAWNIGAN LAKE Prov/State: BC

Postal Code: V0R 2W0

Registered: OCT 20, 2000 updated: MAY 20, 2016 Detail Removed: MAY 20, 2016

Notations: 14 Participants: 8 Associated Sites: 1

Documents: 1 Susp. Land Use: 1 Parcel Descriptions: 15

Status: ACTIVE - UNDER REMEDIATION

Fee category: UNRANKED

=====

CURRENT SITE PROFILE INFORMATION (Sec. III to X)

Site Profile Completion Date: OCT 05, 2001

Local Authority Received: OCT 09, 2001

Ministry Regional Manager Received: OCT 18, 2001 Decision: OCT 24, 2001

Decision: INVESTIGATION REQUIRED

Site Registrar Received: Entry Date:

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE

Schedule 2	
Reference	Description
H15	MUNICIPAL WASTE STORAGE, RECYCLING, COMPOSTING, LANDFILLING

AREAS OF POTENTIAL CONCERN

Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?.....NO

Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?.....NO

Discarded barrels, drums or tanks?.....NO

FILL MATERIALS

Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activities listed under Schedule 2?.....YES

Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?.....NO

Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?.....NO

As of: JUN 26, 2016	BC Online: Site Registry	16-06-29
	For: PB68383 COWICHAN VALLEY REGIONAL DIST.(ACC	11:56:48
Folio:		Page 2

WASTE DISPOSAL

Materials such as household garbage, mixed municipal refuse, or demolition debris?.....YES

waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?.....NO

waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.....NO

waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO

waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); or automobile and truck parts cleaning or repair?.....NO

TANKS OR CONTAINERS USED OR STORED

Underground fuel or chemical storage tanks?.....NO

Above ground fuel or chemical storage tanks?.....NO

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES

PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO

Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO

Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS

Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO

Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO

Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

ADDITIONAL COMMENTS AND EXPLANATIONS

End of Synopsis Report

From: Lindsey Haist
To: Lindsey Haist
Cc:
Subject: FW: Site 1927

Sent: Wed 10/5/2016 3:42 PM

Confirmed that Site 1927 was consolidated with Site 6672 (6627 was a typo) with Vince Hanemayer on October 3, 2016.

From: Lindsey Haist
Sent: Monday, October 03, 2016 10:46 AM
To: 'Samways, Jennifer A ENV:EX'
Subject: Site 1927

Hi Jennifer,

I'm looking into Site 1927 in Shawnigan Lake. The Synopsis Report says it has been consolidated with Site 6627. I ordered a Synopsis Report for 6627 and found the address to be in Fort St. John.

I'm wondering if 6627 might be a typo? Another nearby site that I am looking at is Site 6672 – which is also in Shawnigan. Is it possible that this is the site that 1927 has been consolidated with?

If you are able to look into this and let me know what you find out it would be much appreciated.

Thank-you,

Lindsey Haist
Environmental Technologist
Recycling & Waste Management | Engineering Services Department
Cowichan Valley Regional District
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Appendix C.9

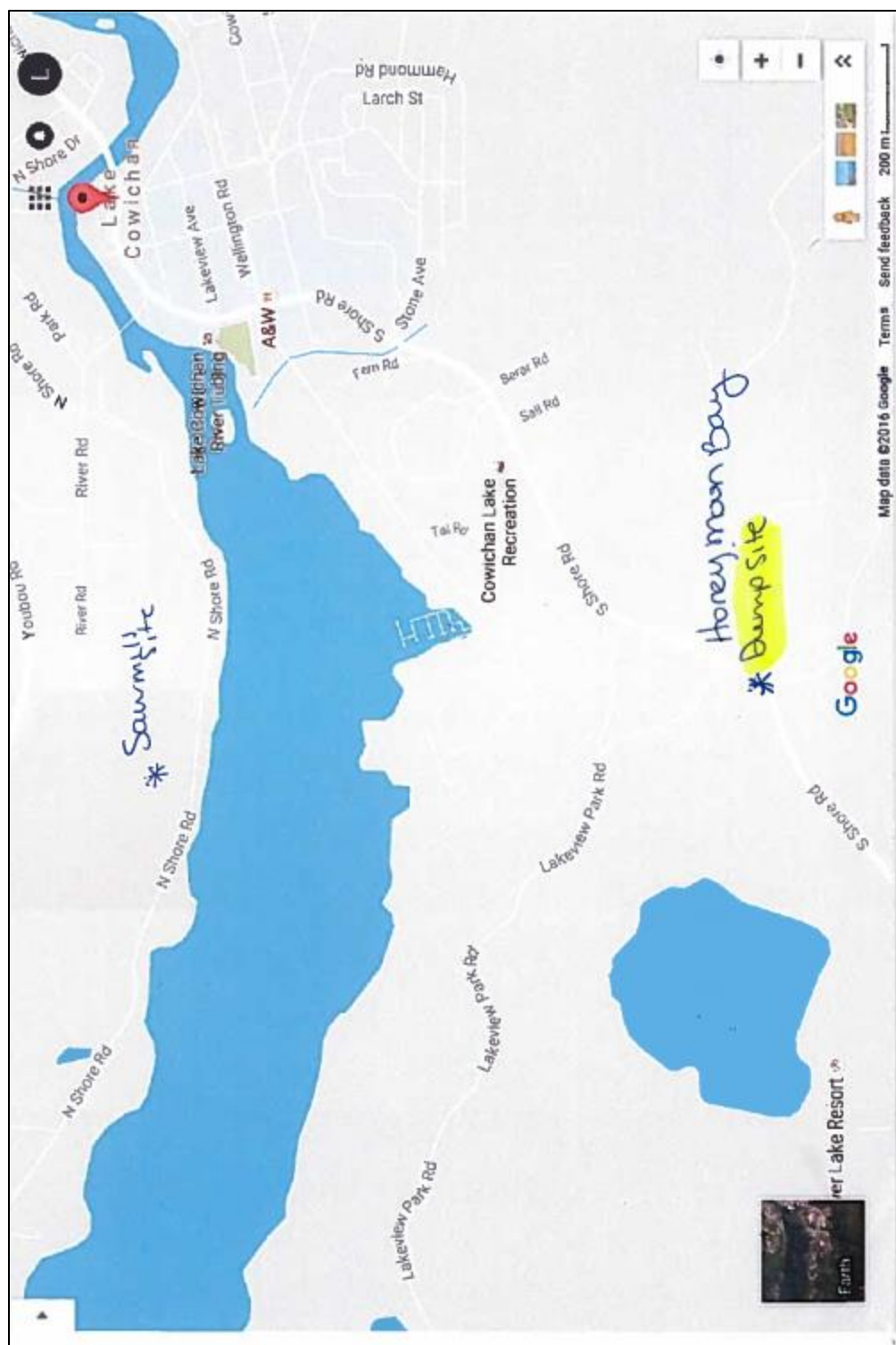
As of: SEP 11, 2016	BC online: Site Registry	16-09-14
Folio:	For: PB68383 COWICHAN VALLEY REGIONAL DIST. (ACC	12:39:47
		Page 1
Synopsis Report		
SITE LOCATION		
Site ID: 3088	Latitude: 48d 48m 48.4s	
Victoria File:	Longitude: 124d 04m 05.1s	
Regional File: 26250-20/PR2383/3088		
Region: NANAIMO, VANCOUVER ISLAND		
Common Name:		
Site Address: SOUTHSHORE ROAD		
City: LAKE COWICHAN	Prov/State: BC	
Postal Code:		
Registered: OCT 29, 1997 Updated: NOV 06, 2001 Detail Removed: NOV 06, 2001		
Notations: 11	Participants: 14	Associated Sites: 0
Documents: 0	Susp. Land Use: 1	Parcel Descriptions: 1
Location Description: SOUTHSHORE RD, 0.5MILES SW OF SW BOUNDARY OF MUNICIPALITY. LAT/LONG DERIVED BY BCE REFERENCING THE TRANSPORTATION CENTERLINE NETWORK (TCN), NAD 83.		
Status: INACTIVE - NO FURTHER ACTION		
Fee category: UNRANKED		
No Site Profile has been submitted for this site		
End of Synopsis Report		

Date of Interview	September 14, 2016
Interviewer Name	Lindsey Haist
Person to be Interviewed	TARA DRY
Location of Interview	CVRD Ingram Office

* Youbou Site #1* LAKE COWICHAN SITE 11

Interview Questions

	<u>Youbou</u>	<u>Honeymoon Bay</u>
1) What is your knowledge of historical dump site?	Suspect it existed from the 40s to the 80s - in later years used for yard, garden and wood waste	been offered to take garbage so we could see the bears and drive through town!
2) What is the approximate location of the site?	approx 1 km past the end of pavement at west end of Youbou	approx 1 km west of town, on south side of road on a large corner just past CLEC entrance on north side
3) What do you know about the ownership of the site?	saw mill owners 4 last ones were TimberWest 4 now (I think) the owners of "Youbou Lands"	nothing
4) What do you know about the material accepted at the site?	originally garbage then #1	garbage dump for Lake Cowichan
5) What do you know about the duration the site was open?	#1 used less for garbage after incinerators opened	not sure, but suspect 40s to 80s
6) When did the site close?	mid 80s?	mid 80s
7) What is the site used for currently?	haven't been there lately but suspect yard, garden and wood waste	I don't think anything



Date of Interview	Oct 21 - 2016 September 14, 2016
Interviewer Name	Lindsey Haist
Person to be Interviewed	Joe Allen
Location of Interview	City of Courtenay Visit to Sites
Historical Landfill Site	Site 2 - Horeymson Bay Site 11 - Lake Cowichan

*confirmed locations
identified in research

Interview Questions

	Site #2	Site #11
1) What is your knowledge of the historical landfill site(s)?	• Used to go to dump as teenager + dump garbage; known owners of property over the years.	• same as site #2
2) What is the approximate location of the site(s)? Please indicate on map if possible.	see attached.	
3) What do you know about the ownership of the site?	Was owned by "Dave Joels", went bankrupt, now owned by bank	Owned by private forest company - run by Lake Cowichan previously
4) What do you know about the material accepted at the site?	Municipal solid waste initially; industrial + wood waste, cars, everything, later	household, metal, everything
5) What do you know about the duration the site was open?	unknown	unknown
6) When did the site close?	unknown	unknown
7) What is the site used for currently?	Gravel pit/forested area	Logged area/forested.



4.14 Facility Closures

To complete the transition from incineration-based disposal to the CVRD's current waste management system, one or three ash residue landfills adjacent to the CVRD's old incinerator sites will be carried out. The Regional District has also identified eleven sites that are old landfill sites or have been damaged by prolonged non-sanctioned refuse dumping. One of these sites has recently been remediated to allow for development. Each of the remaining ten sites will receive rehabilitation or closure measures appropriate to the assessed environmental impairment. The current practise of disposal of screenings from the Cowichan Bay Sewage Treatment Plant and from the Cowichan Bay Sewage Treatment Plant will continue on an interim basis until the Cowichan Bay plant is decommissioned.

4.15 Illegal Disposal

Nuisance level illegal disposal has historically occurred in remote areas of the Cowichan Valley. As noted in Section 3.3, this is addressed by community clean up, supported by CVRD financial incentives. However, larger scale, illegal dumpsites, operated by the landowner for profit, have recently become known. Typically, these sites receive landclearing waste and construction/demolition waste, often from outside the CVRD for very low charges. In order to address this issue, the CVRD, in conjunction with member municipalities, will consider amendments to zoning bylaws that would make acceptance of these types of waste permitted only in very limited zones.

4.16 Regulation of Wastestream

The CVRD will develop a bylaw(s) to regulate municipal solid waste, composting, and recycled materials facilities. Examples of the aspects of operation that could be regulated include, but are not limited to, the following:

- Quantities of materials stored on site
- Quantities of materials received and shipped
- Reporting of types and quantities of materials received and shipped
- Reporting of sources of materials and markets shipped to
- Processing of materials on site
- Payment of licensing fees, bonds, fees for infrastructure cost recovery, and penalties for contravention of the bylaw.



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