

## RDNO Organic Waste Strategy

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### Introduction

Diversion and management of organic wastes has been identified as a key component of the RDNO's overall waste management strategy. This technical memorandum outlines the specific strategy that has been developed through the SWMP update process. The organic waste strategy was arrived at through discussions with RDNO personnel, review of existing programs and their performance, and field inspections of existing waste management facilities. Consideration was also given to organic waste management programs and plans in adjacent regional districts.

### Organic Waste Characteristics

Historical quantities of solid waste generated in the region from 2005 through 2007 were reviewed as part of updates to the RDNO's SWMP. This information was used in conjunction with census data to develop an understanding of the geographic distribution of waste generation within the region, generation rates and ultimately to estimate future solid waste quantities in the North Okanagan region.

Baseline solid waste quantities for the North Okanagan region are summarized in Exhibit 1.

Of the solid wastes that are disposed of at the four RDF's, RDNO's scale data indicates that approximately 40% originates from residential sources and is collected at the curbside or dropped off directly by residents. The balance is from commercial, industrial and institutional (IC&I) sources and construction and demolition projects.

Similarly, almost 100% of the leaf and yard waste delivered to the RDF's is of residential origin; either from curbside collection programs or dropped off directly by residents.

Dimensional wood waste, brush, and chipped wood accepted at the RDF's is generated by both residential and IC&I sources. No detailed information is available on the relative contributions to these waste types.

DLC wastes and soils handled at the RDF's are generated almost exclusively by IC&I sources.

EXHIBIT 1  
RDNO Solid Waste Quantities - 2007

Waste Component	GVRDF	ASRDF	LRDF	CRDF	Total
Solid Waste (landfilled)	39,901.83 <sup>1</sup>	13,229.86 <sup>2</sup>	2,192.68	245.92	55,570.27
DLC	8,800.54	717.33	99.25		9,617.12
Dimensional Wood Waste <sup>3</sup>	3,895.29	1,630.42	349.13		5,874.84
Brush and Chipped Wood <sup>3</sup>	5,280.28	640.95	101.25		6,022.48
Leaf & Yard Waste	2,029.51	2,721.95	144.58		4,896.04
Metals, White Goods, Tires	1,201.40	498.66	182.08		1,882.14
Clean/Contaminated Soil	9,501.19	1,767.12	25.43		11,293.74
RDNO Glass Collection Program (all sites)					101.00
RDNO Drop-bin Program (all sites)					669.66
RDNO Residential Programs (all areas)					3451.12
Non-RDNO Managed Residential Programs <sup>4</sup>					705.91
Totals	70,610.04	21,206.29	3,094.40	245.92	100,084.34

1. Includes materials transferred from Silver Star Transfer Station (SSTS).

2. Includes materials transferred from King Fisher Transfer Station (KFTS).

3. Includes material from IC&I and residential (i.e. self-haul) sources.

4. Includes curbside programs in Spallumcheen, Enderby, Lumby and Indian Reserves, and Hoban OCC Program. Does not include materials diverted through bottle depots, Product Care depots.

## Residential Waste Quantities

Using the above information, it is possible to estimate per capita generation rates for the residential waste stream, and subsequently estimate future waste quantities. These calculations and estimates are summarized in Exhibits 2 and 3. It must be noted that these estimates are not refined enough to account for bulky wastes (e.g. brush, white goods, renovation waste) that residents haul directly to regional disposal facilities.

EXHIBIT 2  
RDNO Residential Solid Waste Quantities - 2007

Waste Component	Total
Residential Solid Waste	22,784
Leaf & Yard Waste	4,896
Recyclables	4,928
Total	32,608
2007 Population	77,301
Per Capita Waste Generation Rate (tonnes/cap per year)	0.42

EXHIBIT 3  
RDNO Residential Solid Waste Projections

Year	Projected Population <sup>1</sup>	Per Capita Rate	Total Waste
2012	81,244	0.42	34,271
2017	85,388	0.42	36,020
2022	89,744	0.42	37,857
2027	94,322	0.42	39,788
2032	99,133	0.42	41,818

1. Based on anticipated population growth in the region of 1% as per BC Stats.

## Residential Waste Composition

As part of the SWMP update process, estimates of the various fractions of the residential solid waste stream were developed. These estimates were based on the quantity estimates contained in Exhibits 2 and 3, and a waste composition analyses completed for RDNO in 2005.

For the purposes of this evaluation, the composition data obtained from samples of residential waste collected through curbside programs was used. A total of 43 discrete samples were obtained at three RDF's (i.e. GVRDF, ASRDF, and LRDF) and were sorted during the 2005 study. Since the distribution of samples between the three sites was uneven, a weighted average of the data was used to arrive at an overall composition which is shown in Exhibit 4.

It is generally known that the quantities of residential waste increase during the Spring, Summer and late Fall due to the presence of yard waste and landscaping debris. For example, in the Regional District of Comox Valley, the variation in waste tonnages collected at curbside during the summer and winter is in the order of 30%.

Volume variations from season to season can be even more significant than weight variations as yard waste tends to have a lower density than the remainder of the waste stream. It is not unheard of for waste volumes in the spring and fall to be double that of winter volumes due to the presence of leaves, grass and brush. This variation must be accounted for in the design and operation of collection and processing programs to avoid bottlenecks. Generally, processing facilities and systems are sized to handle a "peak monthly" quantity of material.

The presence of the yard waste during the warmer months also affects the relative composition of the residential waste stream. More extensive waste composition studies usually involve sampling wastes at various times over the course of a year to capture and quantify this seasonality.

The field sampling undertaken as part of RDNOs 2005 waste composition study was completed in May and June of that year. For planning purposes, the data can therefore be taken as representing summer. By removing the yard waste and landscaping debris from

the calculations, an approximation of composition of waste during the winter can be determined.

Due to the methodology employed, the composition study completed in 2005 focused only on the disposed portion of the waste stream. That is, it did not factor the quantities of waste diverted through recycling or composting programs. Therefore the residential waste composition presented the Exhibit 4 is representative of the portion of the waste being disposed off. To understand the overall characteristics of the residential waste stream “as generated”, quantities diverted through various recycling and composting programs need to be factored back into the analysis.

EXHIBIT 4  
Composition of RDNO Curbside Residential Waste Stream “As Disposed”

Component	Summer	Winter <sup>1</sup>	Annual
Newsprint	2.3%	2.9%	2.6%
Cardboard	1.6%	2.0%	1.8%
Fine/Ledger Paper	0.9%	1.1%	1.0%
Glossy Paper	1.3%	1.6%	1.5%
Contaminated Paper	0.9%	1.1%	1.0%
Tissue & Paper Towel	2.5%	3.1%	2.8%
Other Paper	2.5%	3.2%	2.8%
Glass	2.2%	2.7%	2.5%
Metals	3.8%	4.7%	4.3%
Plastic	8.7%	10.9%	9.8%
Leather	0.2%	0.2%	0.2%
Rubber	1.8%	2.2%	2.0%
Kitchen Organic Waste	22.1%	27.7%	24.9%
Yard Waste (leaves and grass)	1.8%	0.0%	0.9%
Landscaping Debris (branches & mulch)	18.4%	0.0%	9.2%
Wood Waste	7.0%	8.8%	7.9%
Other Organic Waste	0.4%	0.5%	0.4%
Brown Goods	1.7%	2.1%	1.9%
Bulky Goods	0.2%	0.2%	0.2%
Textiles	4.9%	6.2%	5.6%
Construction	6.7%	8.4%	7.6%
Residue	0.7%	0.9%	0.8%
Hazardous	7.0%	8.8%	7.9%
Other	0.4%	0.5%	0.5%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

1. Winter composition estimated from summer composition without yard waste components.

Exhibit 5 contains quantity estimates of the various fractions of the residential solid waste stream. These estimates were based on the waste composition analyses along with recycling program records and scale data from the RDF's.

EXHIBIT 5  
RDNO Residential Waste Quantities

Component	Disposed at Curbside		Recycling Programs		Composting	Totals
	% of Total <sup>1</sup>	(tonnes)	% of Total	(tonnes)	(tonnes)	(tonnes)
Newsprint	2.6%	587	70.2%	3,214		3,801
Cardboard	1.8%	419	19.3%	1,134		1,553
Fine/Ledger	1.0%	235				235
Glossy	1.5%	331				331
Contaminated Paper	1.0%	224				224
Tissue & Paper Towel	2.8%	643				643
Other Paper	2.8%	647				647
Glass	2.5%	562	0.6%	128		690
Metals	4.3%	969	3.2%	144		1,113
Plastic	9.8%	2,239	6.7%	307		2,546
Leather	0.2%	39				39
Rubber	2.0%	451				451
Kitchen Organic Waste	24.9%	5,682				5,682
Yard Waste	0.9%	208			4,896	5,104
Landscaping Debris	9.2%	2,097				2,097
Wood Waste	7.9%	1,805				1,805
Other Organic Waste	0.4%	95				95
Brown Goods	1.9%	429				429
Bulky Goods	0.2%	41				41
Textiles	5.6%	1,268				1,268
Construction	7.6%	1,728				1,728
Residue	0.8%	186				186
Hazardous	7.9%	1,796				1,796
Other	0.5%	105				105
<b>Total</b>	<b>100%</b>	<b>22,784</b>		<b>4,928</b>	<b>4,896</b>	<b>32,608</b>

1. Based on average annual composition from Exhibit 4.

## Organic Waste Stream

The organic fraction of the solid waste stream is generally considered to include food waste, yard waste, landscaping debris, and wood. Depending upon the processing technology employed, it is also possible to include some portions of the paper waste stream into the organic fraction. Generally contaminated paper (e.g. soiled with food), tissue, and paper towel are the components of the paper fraction that are targeted for inclusion in organic waste management programs.

Estimates of the quantities of the various organic fractions in the residential waste stream are contained in Exhibit 5. A summary of these estimates is provided in Exhibit 6.

EXHIBIT 6  
RDNO Residential Organic Waste Quantities

Waste Component	Disposed (tonnes)	Diverted (tonnes)	Total (tonnes)
Contaminated Paper	224		224
Tissue & Paper Towel	643		643
Food Waste	5,682		5,682
Yard Waste (leaves and grass)	208	4,896	5,104
Landscaping Debris (branches and mulch)	2,097	N/A <sup>1</sup>	2,097
Wood Waste	1,805		1,805
Other Organic Waste	95		95
Dimensional Wood Waste		N/A <sup>1</sup>	
<b>Totals</b>	<b>10,754</b>	<b>4,986</b>	<b>15,650</b>

1. The amount of wood waste that is received at the RDF's directly from residential sources (i.e. self-hauled waste) is not tracked separately, but it is included in the quantities contained in Exhibit 1.

## Existing Organic Waste Infrastructure

Management of organic wastes in the RDNO is currently limited to programs that target the following materials:

- yard waste which includes grass, garden waste, windfall fruit, leaves, small shrubs, prunings and small diameter branches (i.e. < 20 cm in diameter);
- untreated and treated dimensional wood waste from construction and demolition projects;
- Christmas trees; and
- logs, stumps, and large diameter (i.e. > 20 cm) brush from landscaping and land as well as pine beetle deadwood removed for fire prevention or safety reasons.

## Collection Programs

Although some member municipalities in the RDNO have established specific programs for their residents, there are no collection programs that service the region's commercial, industrial or agricultural sectors. However, all area businesses have the option to divert yard waste, logs/stumps/brush, and dimensional wood through drop-off programs operated at RDNO's five recycling and disposal facilities (RDF's). The drop-off programs offered by RDNO are also available to all residents in the region.

The RDF-based programs require all customers to segregate and drop off their yard and wood wastes in designated areas at each site. Customers are charged a reduced tipping fee for these materials (\$20/tonne for prunings, yard waste and clean dimensional lumber, and \$35/tonne for logs/clean stumps/brush >20cm in diameter). This provides a financial incentive as the tipping fees for these materials are significantly less than the regular tipping fees for waste (i.e. \$59/tonne).

As part of RDNO's "anti-burning campaign", tipping fees for yard wastes are waived for area residents during the early spring and late fall. There is no limit on the amount of yard waste residents can deliver to the RDF's provided it is clean and segregated.

Yard waste, treated/untreated dimensional wood waste and logs/clean stumps/brush collected at the RDF's are ground at each site, and the resulting wood chips are spread onsite during wet weather to improve traction, composted, or used for odour suppression on closed cells (bio-cover). A portion of the chips produced from untreated dimensional wood waste and logs/clean stumps/brush collected at the GVRDF and Armstrong/Spallumcheen RDF (ASRDF) have also been sold to a co-generation facility located north of Vernon.

Residents in the population centers of Vernon, Armstrong, Enderby, Lumby and Spallumcheen (one subdivision only) are able to divert yard waste through annual curbside "clear-bag" programs run by their respective municipalities. These curbside programs are offered for one week during the spring and/or fall as part of normal collection services. Coldstream allows its residents to drop off yard waste at its former landfill site on four sequential Sundays during the spring and fall. The City of Vernon and Village of Lumby also provide curbside chipping programs in the spring in association with the clear bag programs. There are no limits on the amount of yard waste that can be recycled by residents through these programs, provided the materials are clean and in clear plastic bags. Materials from the collection programs are taken to the GVRDF or ASRDF where they are debagged by the municipality's contractors.

The City of Vernon provides a Christmas tree diversion program for its residents and those of the District of Coldstream and RDNO. In January of each year, the City establishes a temporary depot location where residents can drop their old Christmas trees off. The trees are chipped by City personnel and the chips are transferred to the GVRDF.

A summary of the collection programs is provided in Exhibit 7.

## Processing Facilities

There are several on-farm composting facilities within RDNO boundaries, but only two municipal facilities. The first is a biosolids composting facility that serves the Cities of Kelowna, Lake Country and Vernon. It is located approximately 3 km south of the GVRDF. The site was constructed within the past five years as a joint initiative between the City of Kelowna and the City of Vernon to process their dewatered biosolids. The site is managed by the City of Kelowna, and uses aerated static pile technology. Product from the facility is marketed by the City of Kelowna through their Ogogrow program.

The GVRDF composting facility is located on the northwestern portion of the landfill property on Birnie Road. The composting facility and landfill are well situated to service

the southern portions of RDNO, including the major population concentration in Vernon. The facility is easily accessible from Hwy 97 and can accommodate a range of residential and commercial waste collection vehicles. The composting facility is in the process of being redeveloped to increase its annual capacity.

EXHIBIT 7  
Summary of Organic Waste Collection Programs

Area	Clear Bag (Curbside)	Clear Bag (Drop-off)	Curbside Chipping	Christmas Trees
City of Armstrong	Spring/Fall			
City of Enderby	Spring only			
District of Coldstream		Spring/Fall		Drop-off
Village of Lumby	Spring only		Spring	
Twp of Spallumcheen	Spring only			
City of Vernon	Spring/Fall		Spring	Drop-off

## Organic Waste Strategy

A summary of the organic waste strategy for the RDNO is provided in tabular form in Exhibit 8. The strategy consists of thirteen specific programs that focus on reducing the amount of organic waste that requires centralized management, collection of organic wastes, and processing organics wastes. The specific programs are discussed in further detail in the following sections.

### Organic Waste Reduction Programs

The primary goal of the organic waste strategy's reduction programs is not to prevent the generation of organic waste, but rather to reduce the amount of infrastructure needed to manage organic wastes. Other components of the overall solid waste management strategy, specifically education and outreach programs, will encourage waste generators to reduce consumption of resources and otherwise change their personal habits to reduce generation of waste.

This component of the organic waste strategy focuses on providing residents with the means of managing a portion of the organic waste they generate at the household or business level. This in turn reduces the amount of municipal or regional infrastructure that is needed to collect and manage organic wastes through a centralized approach, and reduces costs to households and businesses in the region.

Expected diversion from these reduction programs is low relative to other components of the strategy, and is in the order of 100 to 150 tonnes per year (~5% of available materials).

**EXHIBIT 8**  
Organic Waste Strategy Components

	<b>Component</b>	<b>Program Details</b>
<b>Reduction</b>	Natural Landscaping and Yard Care Program	RDNO will continue to promote natural yard care (e.g. xeriscaping, herbicide reduction, grass-cycling) as a means of reducing yard waste generation.
	Master Composter Program	RDNO will develop a Master Composter program to encourage backyard composting of yard wastes, thereby reducing the impacts on regional infrastructure. Through periodic workshops offered at the Compost Demonstration Garden (Xerindipity) and educational resources, the program will teach appropriate methods of composting suitable for RDNO climate and conditions.  Consideration should be given to operating this program in conjunction with adjacent regional districts.
	Backyard Composting Program Review	The RDNO will continue to operate the existing program to subsidize the purchase of backyard composters by RDNO residents while undertaking targeted surveys of previous program participants to document and assess the effectiveness of the program. Based on the survey response, the program would be restructured or refined as necessary to boost participation and diversion.  Consideration should be given to operating this program in conjunction with adjacent regional districts to share resources and possibly obtain preferential pricing on composting bins.
<b>Collection</b>	Mandatory Yard Waste Separation	Amend RDNO Bylaws 1598 and 2328 to include yard waste and brush in the list of materials to which mixed load tipping fee surcharges are applied at RDF's.
	Expanded Yard Waste Drop-off Network	RDNO will expand the existing network of yard waste drop-off depots to provide greater access and convenience to residents, and boost participation rates. In particular, new depots will be established in Vernon (north side), Coldstream, and Enderby to supplement the existing depots at RDF's.  All drop-off programs would operate using a common set of acceptance criteria and a common education program. Where possible, collection methods should be standardized at depot sides to reduce program operating costs.
	Expanded Christmas Tree Collection	RDNO will work with municipalities to establish or enhance Christmas Tree collection programs in major population centers.
	Periodic Yard Waste Collection Program	RDNO will work cooperatively with municipalities to standardize waste collection programs, schedules and contracts (e.g. universal waste collection), and incorporate periodic (e.g. Spring and Fall) collection of yard waste in all major population centers over the next 1 to 2 years.
	Seasonal Yard Waste Collection Program	RDNO will work cooperatively with municipalities to investigate the cost and feasibility of expanding yard waste collection programs from a periodic to a seasonal basis (e.g. April through October) in major population centers. Programs would commence in 3 to 5 years.
	Improved Wood Waste Segregation Program	The RDNO will review existing acceptance criteria and collection programs for wood wastes at its RDF's. The goal of the review will be to establish a segregation program that provides the maximum amount of flexibility in wood diversion/reuse options.  Programs should be harmonized with other regional districts.

**EXHIBIT 8**  
Organic Waste Strategy Components

	<b>Component</b>	<b>Program Details</b>
	Regional Yard Waste Composting Facility	The RDNO will develop a single regional composting facility at the GVRDF to process yard waste collected from curbside and depot programs. The RDNO will implement operational standards at the regional composting facility that incorporate best management practices to reduce fugitive odours and other nuisances and comply with regulations (i.e. OMMR and Fertilizer Regulations).
	Expanded Regional Composting Initiative	Once a regional yard waste composting program has been established and is successfully operating without creating nuisance conditions, the RDNO will consider expanding the scope of materials accepted to include specific residential food wastes.
<b>Processing</b>	Promote Development of Private Facilities	RDNO will encourage the private sector to develop organic waste management facilities to service ICI and agricultural waste generators. This can be done by providing non-monetary support and information on waste sources and quantities to prospective developers, and establishing policies and bylaws as necessary to create a framework for facilities to operate within, including land use criteria in zoning bylaws. The latter should include bylaws to supplement existing provincial regulations to protect against environmental impacts, nuisances and impacts on resident's quality of life.
	Mulch Production	RDNO will assess the demand for, and the feasibility of producing and selling mulch products made from clean wood waste received at the RDF's.
	Regional Coordination of Wood Waste Management	RDNO will work with adjacent regional districts to coordinate wood waste uses and supply contracts to reduce competition for existing markets (e.g. co-generation, and amendment for biosolids composting).

### Natural Landscaping and Yard Care Program

Yard waste and garden debris, grass, leaves, and brush are a significant component of the organic waste stream generated by both residences and businesses. By encouraging the switch to natural landscaping practices, the amounts of these materials can be reduced. A natural landscaping program would also have added benefits of promoting water conservation and reducing environmental impacts resulting from fertilizer and pesticide use, both of which are high profile issues in the Okanagan Valley.

RDNO's existing program makes resources available to residents and businesses through educational materials, a community education garden in Vernon (Xerindipity), and by supporting local NGO's who provide periodic workshops. Resources on a wide range of natural landscaping practices are also readily available via the internet from municipalities and associations in British Columbia and the Pacific North West.

RDCO should invest in increasing the profile of its existing program through a renewed educational and promotional program. This should include increased cooperation with local landscape professionals, garden centres, and "big-box" hardware stores.

## Master Composter Program

Master Composter Programs are a common outreach tool used by many municipalities to raise awareness and increase participation in waste reduction and diversion programs. Through periodic “train-the-trainer” style workshops, volunteers from the community are trained on successful backyard composting practices which they can use themselves and can also help implement in their neighbour’s homes. Volunteers are often also “groomed” to become ambassadors for broader waste management initiatives, and provide a volunteer-base which Waste Managers can tap into for assistance with promotional events.

Examples of successful programs include those operated by the City of Edmonton, Seattle Public Utilities, and the Alameda County Waste Management Authority.

As part of the organic waste strategy, RDNO would develop a Master Composter program in conjunction with adjacent regional districts (e.g. CSRD). A program similar to the Master Composter Program run by the City of Edmonton is envisioned where workshops are put on two to three times per year by City staff. In developing the program, RDNO and its partnering regional districts should look to acquire and modify existing Master Composter resources rather than developing them from scratch.

## Backyard Composting Incentive Program

Like many municipalities in Canada and the United States, RDNO provides subsidized backyard composting bins and vermicomposting bins to residents as part of its outreach programs. Although this does not normally result in a significant degree of waste reduction, it does help to promote the concept of generators being responsible for their own wastes.

RDNO should undertake a targeted survey of prior participants in the subsidized bin program to gauge the impact and success of the program. Specific questions would be asked to determine, for example, how many of the subsidized bins are still being used and how much and what types of materials are being diverted. This information can then be used to demonstrate the effectiveness of the existing program, or to refine it as necessary.

## Organic Waste Collection Programs

As previously outlined, yard waste including leaves, grass and brush is a significant component of RDNO’s solid waste stream on a seasonal basis. Food waste is a major contributor to overall waste quantities on a year round basis. Diversion of yard wastes is generally achieved either through drop-off depots or curbside collection programs. Food waste diversion is normally only done through curbside programs.

The organic waste strategy is based on the premise of **slow growth** in collection and processing programs as experience has shown that rapid growth can lead to problems related to odours and nuisance conditions at facilities.

## Mandatory Yard Waste and Brush Separation

Through its bylaws, the RDNO has applied economic instruments to encourage the separation and diversion of a wide range of recyclable materials (e.g. tin cans, glass jars and bottles, newsprint, cardboard) as well as tires, metals, wet batteries, grindable concrete, and drywall. Specifically, Bylaw 1598 identifies these materials as “recyclable materials”, and

prohibits the disposal of loads containing more than 10% (by volume) of these materials at RDF's and transfer stations. Bylaw 2328 establishes a tipping fee schedule for RDF's that includes specific surcharges for loads containing recyclable materials in excess of 10%.

Building on the framework for designating and applying disposal surcharges that is already in place, the organic waste strategy includes amending the applicable bylaws to include yard waste (e.g. grass, leaves, garden waste), brush, logs, stumps and christmas trees. This action, in association with existing collection and processing infrastructure, will provide further incentive for businesses and residents to divert these materials.

Based on the historical success of this approach with other materials, the impact of including yard waste and brush into the bylaw framework is expected to be significant. In combination with other collection strategies, diversion of an additional 1,600 to 1,800 tonnes per year (70 to 80% of available materials) from residential sources is expected. This strategy will also further encourage diversion by the IC&I sector.

### **Expanded Yard Waste Drop-off Network**

Although diversion rates for drop-off collection program are generally much lower than for curbside collection program, this approach is common used throughout Canada for yard waste collection. Drop-off depots have relatively low capital and operating costs, and are particularly well suited to areas with small population bases or low population densities. Drop-off programs can also provide service to both residential and commercial sectors.

The existing yard-waste depot system in RDNO is well established, with locations at each of the RDF's. However, experience in other Canadian jurisdictions has shown that participation in drop-off programs is tied strongly to convenience and accessibility of the site. For that reason, the existing network of drop-off sites in RDNO should be expanded to include additional sites close to larger population centers. Specifically, RDNO should work with the municipalities to establish three new permanent sites in Enderby, Coldstream, and on the north side of Vernon.

All drop-off programs would operate using a common set of acceptance criteria (e.g. separation of grass/leaves from brush, no branches greater than 2" in diameter) and a common education program. Where possible, collection methods would be standardized to reduce program operating costs. The overall goal of the program is to provide operational advantages at the composting site, and equalize service amongst residents in the area, and provide a common messaging to residents throughout the region.

To control operating costs and manage potential nuisance conditions, these new sites should be oriented for residential users with small volumes of materials. Commercial generators, in particular landscape contractors, should be directed to existing drop-off locations at the RDF's which are better suited to handling larger volumes of materials.

### **Expanded Christmas Tree Collection**

Successful programs for collecting/diverting Christmas trees are already being offered to residents in the Vernon area. RDNO should build upon the success of this program and expand it to other areas in the region. A drop-off service could be offered in population centers which do not currently have such as program (e.g. Enderby, Lumby, Spallumcheen and Armstrong). This could be combined with a free drop-off period at all RDF's.

The amounts of materials that will be diverted through this program are small relative to other collection programs; in the order of 50 to 100 tonnes per year.

### **Curbside Organic Waste Collection**

Residential curbside organics collection is normally accomplished through modifications to curbside waste collection practices. In their most common form, programs involve segregation of yard and/or food wastes from other waste in discrete containers or bags, and separate collection of the two streams (in a split compartment truck or using two separate trucks). Automated or semi-automated collection methods can also be employed when curbside organic waste collection programs are implemented, and are accompanied with the use of wheeled carts.

Periodic curbside collection of yard waste is already being offered in most population centers in the region. As part of the organic waste strategy, and the efforts to implement consistent curbside waste collection services throughout the region, RDNO would take a leadership role to facilitate expanding this service to all population centers, extending the collection periods (i.e. two to three weeks in Spring and Fall) and ensuring that acceptance criteria, scheduling, and promotions are consistent throughout the region.

In the longer term, as collection programs mature and participation increases, RDNO can again assume a facilitation role to expand the collection period to a seasonal basis (e.g. April through October). Ultimately, curbside collection programs would mature to include year round collection of residential yard waste and food waste.

### **Improved Wood Waste Segregation Program**

Wood waste volumes in the Okanagan area have significantly increased during the past several years due to a combination of construction, forest fire prevention programs, and an infestation of mountain pine bark beetle. The upward trend in wood waste volumes is expected to continue for the next several years.

The existing practice of separating wood waste at RDF's for grinding and subsequent, beneficial reuse allows a significant volume of airspace to be conserved and the disposal facilities. It is recommended that this practice be continued and enhanced.

Depending upon the volumes of materials handled and the frequency of grinding operations, a large storage area can be required to host a wood waste diversion area. Furthermore, the types of vehicles that frequent this area (e.g., cars and trucks with trailers, 1-tonne trucks, dump trucks) make it necessary for safety reasons to have clear access and a wide working face.

It is recommended that incoming wood wastes be segregated into four categories at each site. This degree of segregation allows for greater flexibility in directing the waste into the beneficial reuse program that are currently available or expected to develop over the coming years. The recommended segregation and uses are provided in Exhibit 9

Special consideration also needs to be given to fire controls and prevention of spontaneous combustion in wood waste stockpiles. Availability of source of water for firefighting is a key first step. Additional controls can be achieved by limiting the size of stockpiles, maintaining

aisles between adjacent stockpiles for equipment and fire department access, and staging fire-fighting equipment nearby.

**EXHIBIT 9**  
Wood Waste Segregation Categories

<b>Categories</b>	<b>Recommended Uses</b>
Dimensional wood –treated/painted	Grind for use on onsite roads and working surfaces  Grind for use as alternative daily cover in landfill operations
Dimensional wood – untreated/unpainted	Grind for use at co-generation facility  Grind for use as amendment in yard waste or biosolids composting operations  grind for use/sale as mulch
Large branches (more than 1.5” diameter), and logs and stumps	Grind for use at co-generation facility  grind for use as amendment in yard waste or biosolids composting operation
Small branches and tree prunings less than 1.5” diameter	Incorporate directly into yard waste composting operation

It is further recommended that RDNO informally work with adjacent regional districts to share information on wood waste programs and quantities, with the aim of coordinating wood waste reuse opportunities. Currently there are a limited number of outlets for wood waste in the area (e.g. co-generation, biosolids composting amendments), and regional districts are sometimes competing for available capacity. It is believed that by adopting consistent collection programs and producing ground materials to common specifications, managing the reuse opportunities materials will become simpler and stockpiles can be managed more effectively.

## Organic Waste Processing

### Regional Yard Waste Composting Facility

In conjunction with the expansion of existing yard waste collection programs, it is necessary to have one or more strategically located regional facilities to process the materials. Parallel to the SWMP update process, RDNO has undertaken the redevelopment of the existing windrow composting facility at the GVRDF. Once completed, this facility will serve as regional processing facility for yard waste collected from the various drop-off and curbside collection programs.

It is expected that the GVRDF facility will be operated on a day-to-day basis by private sector operators, and overseen by RDNO technical staff.

A key component to the success of the regional facility will be the adoption of operating standards that incorporate best management practices to reduce fugitive odours as well as appropriate process monitoring and controls to prevent nuisance conditions.

Markets for compost products in the Okanagan region are well established and demand is high. With such mature markets, development of appropriate quality assurance and quality control (QA/QC) programs will be necessary so that the facility will be able to consistently produce products to defined specifications. Variable products that do not produce consistent results can damage market perceptions of products and/or brand(s). A QA/QC program is simply the combination of various tools, measures and proactive management methods that allow control of inputs, processes, and outputs to meet customer requirements. A typical QA/QC program at a compost facility consists of adoption/development of product standards and specifications, implementation of process controls, and finished product testing.

### **Expanded Regional Composting Initiative**

Once the redevelopment of the regional yard waste facility has been completed and the site has demonstrated its ability to successfully operating without creating nuisance conditions, RDNO should consider expanding the scope of materials accepted by the facility to include residential food waste. Consideration of this change would be dependant in part upon the progression of curbside collection programs in the region.

Incorporation of food waste diversion would involve changes to promotion and education programs, collection programs, and to the composting operation itself. There are many successful examples of programs in Ontario and Eastern Canada that can be used as references.

The initial step should be the completion of a feasibility study that considers the changes that would be necessary to both collection and processing programs, and regional transfer of materials to one or more processing sites.

The specific feedstocks accepted would be identified and assessed on a case-by-case basis by RDNO, with consideration given to quantities and rate of generation, potential to attract wildlife or vectors, and possible impacts on final product quality. A key consideration would be the capability of the composting methods employed to process the materials without creating nuisance conditions, or whether accepting the material would drive the need to upgrade processing methods and/or technology.

### **Private Sector Development**

Organic wastes generated by the residents are typically very easy to divert due to the nature of collection systems and municipal controls/responsibilities that are in place. On the other hand, organic wastes from IC&I sources is more difficult to capture as generators are responsible for themselves, and collection programs are often fragmented amongst many private contractors. Despite this, IC&I organic wastes present a significant opportunity for diversion and often the wastes make excellent feedstocks for composting or anaerobic digestion facilities. It is estimated there is in the order of 9,000 to 12,000 tonnes of organic waste generated by the IC&I sector in RDNO.

Provision of processing capacity for IC&I organic wastes by small local governments waste management systems can result in high costs being incurred, and issues of access and fairness. It is therefore recommended that the RDNO encourage the private sector to develop the necessary processing infrastructure and include waste from neighbouring

regions as well. This should be done through non-monetary measures to ensure there is a level playing field amongst all potential developments. The RDNO can provide support and information on waste sources and quantities to prospective developers, and should also establishing policies and bylaws to create a framework for facilities to operate within. The bylaws and policies adopted by Cowichan Valley Regional District are an example of the type of framework that can be implemented by RDNO.

### Mulch Production

As part of the operation of the regional composting facility, and as a means of expanding beneficial reuse opportunities for wood wastes, the RDNO should assess the demand for mulch products in the region. If the demand is strong, RDNO can subsequently assess the feasibility of producing and selling mulch products made from clean wood waste received at the RDF's.

## Resource Requirements and Implementation Schedule

An estimate of the incremental manpower requirements and/or costs associated with each component of the organic waste strategy (relative to existing resources and budgets) is provided in Exhibit 9. Estimates of the incremental quantity of material diverted through each component (relative to that diverted through existing programs) is also included in Exhibit 10.

A summary of the proposed implementation schedule for each of the strategy components is also provided in Exhibit 10.

## Summary

The long-term potential increase in diversion of organic wastes resulting from the implementation of the proposed strategy would be in the order of 1,750 to 2,050 tonnes per year from the residential sector, and 3,000 to 5,000 tonnes per year from the IC&I. This would be in addition to residential and IC&I yard waste, brush and land clearing debris that is already being diverted (approximately 11,000 tonnes per year).

The initial capital funding required for strategy implementation is in the order of \$50,000. Once all programs are established, initial annual incremental operating costs incurred by RDNO and the municipalities are estimated to be \$37,500, increasing to \$825,000 per year in the future once curbside collection programs are implemented.

Implementation of the strategy would also result in the following indirect benefits:

- landfill airspace is preserved for wastes which have no reuse/recycling options;
- fire hazards within the landfill cells are reduced;
- traffic at RDF's is reduced;
- convenience to customers is increased;
- helps to increase overall environmental awareness; and
- self sufficiency of individual waste generators is increased.

EXHIBIT 10  
Organic Strategy Incremental Manpower and Cost Estimates

Strategy Component	RDNO Staff Time		Capital Cost	Annual O&M Costs	Anticipated Diversion (tonnes/yr)	Implementation Period		
	Startup	Routine				0-2 yrs	3-5 yrs	5-10 yrs
Natural Landscaping and Yard Care Program		8 hrs/month	N/A	5,000		✓		
Master Composter Program	40 hrs	16 hrs/month	5,000	5,000	100 to 150 <sup>1</sup>	✓		
Backyard Composter/Vermicomposter Program (including program review)	80 hrs		5,000	<5,000		✓		
Mandatory Yard Waste Separation	80 hrs		0	0	N/A	✓		
Expanded Yard Waste Drop-off network	80 hrs	4 hrs/month	22,500	12,500	500 to 600 <sup>2</sup>	✓		
Periodic Yard Waste Collection	120 hrs	40 hrs/year	0	135,000 <sup>5</sup>	900 to 1,100 <sup>3</sup>		✓	
Seasonal Yard Waste Collection	160 hrs	40 hrs/year	0	800,000 <sup>5</sup>	1,600 to 1,800 <sup>4</sup>			✓
Expanded Christmas Tree Collection	80 hrs	16 hrs/year	0	10,000	50 to 100	✓		
Improved Wood Waste Segregation Program	80 hrs	8 hrs/month	2,500	0	N/A	✓		
Regional Yard Waste Composting Facility		16 hrs/month	0 <sup>6</sup>	0 <sup>6</sup>	N/A	✓		
Expanded Regional Composting Initiative (external feasibility study only)	80 hrs		15,000	0	N/A			✓
Promote Development of Private Facilities	160 hrs	8 hrs/month	0	0	3,000 to 5,000	✓		
Mulch Production (Internal feasibility study only)	120 hrs		0	0	N/A	✓		
Regional Coordination of Wood Waste Management	40 h	8 hrs/month	0	0	N/A	✓		
Totals	1,120 hrs	912 hrs/year	50,000	37,500 to 825,000	4,750 to 7,050			

1. Based on capture of ~5% of yard waste and landscape debris remaining in residential waste stream.
2. Based on capture of ~25% of yard waste and landscape debris remaining in residential waste stream.
3. Based on capture of ~50% of yard waste and landscape debris remaining in residential waste stream.
4. Based on capture of ~75% of yard waste and landscape debris remaining in residential waste stream.
5. Based on \$1.25 per household per week for collection service.
6. Development and operational costs accounted for in existing capital and operating budget projections.