



Niche Market Opportunities for Compost Produced at the Vancouver Landfill

Executive Summary

Greenest City Scholar

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Project Overview

This project is part of the Greenest City Scholars program in conjunction with the University of British Columbia's Sustainability Scholars program, to support the City of Vancouver's Greenest City Goals. In particular, this project supports the Zero Waste goal to reduce waste entering the Landfill by 50% of 2008 amounts. The Vancouver Landfill (VL) Composting Facility closes the loop between collections and processing within City operations, diverts yard waste away from the landfill, and aims to produce high quality yard waste compost.

Project Objective

The objective of this project was to identify the market niche that VL compost currently fills in Metro Vancouver, and any additional opportunities to maintain and increase demand for VL compost. This project focused on *product quality* (characterization), *sales strategy* (volume controls), *product markets*, *customer service*, and *opportunities* to produce one or more specialty compost products.

Project Tasks

The project included the following tasks:

1. *Compost Characterization*: Review VL compost lab analyses and external guidelines to characterize VL compost properties according to industry standard and confirm suitable applications.
2. *Compost Sales & Donations Review*: Identify sales trends by customer type and compost use, and verify the current process for compost sales and volume controls.
3. *Compost Target Markets*: Identify key stakeholders (VL Staff, Parks Board and Engineering groups Staff, and other VL customers) for interview to verify target markets for VL compost in light of market supply.
4. *Program SWOT Analysis*: Evaluate VL composting program strengths, weaknesses, opportunities and threats through consultations with several dozen stakeholders.
5. *Program Recommendations*: Develop short and long term recommendations for program optimization based on the SWOT analysis.
6. *Market Expansion Opportunities*: Research requirements for organic use certification, additional product blend specifications, and other areas for potential growth.
7. *Program Documentation & Resources*: Develop/update communication resources to support compost marketing for Sales Staff, including the compost page on the City of Vancouver (CoV) website.

Outcomes by Task

Characterization of VL Compost

Based on its physical and chemical properties, VL compost can best be described as an *organic soil amender* (with “organic” referring to biological material and not a certification). The finished product is a finely textured, dark, black soil amendment that has little odour. Variation in the composition of the yard waste feedstock by season creates a product that is variable in its chemical (nutrient) composition. It is consistently well under the Organic Matter Recycling Regulation of B.C. (OMRR) limits for heavy metals and foreign matter. VL compost parameter levels are within nearly all ideal ranges as demonstrated in Table 1 below.

Table 1: Comparison of Finished Compost Values

Parameter	VL Compost (yard waste only) ¹	Yard Waste & Food Scraps Compost ²	Ideal Range for Finished Compost ³
C:N	22:1 - 13:1	30:1 - 25:1	25:1 - 10:1
% OM	30.8 - 41	55 - 65%	40 - 60%
% Sand	31.4 - 41.3	NA	15 - 35%
% Silt and Clay	27.2 - 35.4	NA	15 - 30%
pH	7.1 - 7.9	6 - 7	6 - 7.5
Max Particle Size	100% passing 12.5mm sieve	100% passing 9.5mm sieve	100% passing 12.5mm sieve
Electrical Conductivity (E.C.) (dS/m)	<3.9	<5	<5
Available Ammonia-N (ppm)	10 - 131	NA	<500
Available Nitrate-N (ppm)	49 - 117	NA	200 - 500
Nitrogen (%)	0.9 - 1.3	0.9 - 1.2	0.5 - 2.5
Phosphorus (ppm)	260 - 860	500 - 1,000	
Potassium (ppm)	2,500 - 3,900	4,000 - 5,000	
Calcium (ppm)	4,900 - 7,600	3,000 - 4,000	
Magnesium (ppm)	800 - 1,100	1,000 - 1,500	

Note: Information in Table 1 compiled from the sources below.

1. Pacific Soils Analytics Inc. (2013 - 2016). Lab analyses for Vancouver Landfill compost. Retrieved from Vancouver Landfill shared drive
2. Harvest Power. (2014). Product specification [Information Sheet]. Retrieved from <http://www.robergetrucking.com/PDF%20Files/Soil%20Amender%2014.pdf>
3. Cooperband, L. (2002). *The art and science of composting - A resource for farmers and compost producers*. Retrieved from Center for Integrated Agricultural Systems, University of Wisconsin-Madison website: <http://www.cias.wisc.edu/wp-content/uploads/2008/07/artofcompost.pdf>

Applying compost to the landscape can enrich soil health and productivity. Table 2 below includes guidelines for compost use by application.

Table 2: Guide for VL Compost Use

Application	Amount	Instructions
<i>New Lawn</i> ¹	25mm (1 inch)	Incorporate into the top 125-150mm (5-6 inches) of soil before planting
<i>Established Lawn</i> ¹	≤25mm (≤1 inch)	Spread a light layer evenly across the surface, then, aerate the lawn to work the compost into the ground
<i>New Planting Bed</i> ¹	25-75 mm (1-3 inches)	Incorporate into the top 150-200 mm (6-8 inches) of the entire bed (not just where the plants are going in)
<i>Established Planting Bed</i> ¹	12.5-25 mm (1/4-1/2 inch)	Apply annually, for raised beds fill to initial soil line
<i>New Potting Plant</i> ²	Mix 3:1 sand to compost	Mix sand and compost, let sit for a week before planting, water after planting
<i>Established Potting Plant</i> ²	≤25mm (≤1 inch)	Fill to initial soil line annually, fertilizers may be necessary
<i>Landscape Mulch / Top Dressing</i> ²	25-75 mm (1-3 inches)	Spread evenly over the surface, leave space around tree and shrub trunks and stems, water afterward to keep it in place

Note: Information in Table 2 compiled from the sources below.

1. The US Composting Council. (2001). *Field guide to compost use*. Retrieved from http://compostingcouncil.org/wp/wp-content/plugins/wp-pdfupload/pdf/1330/Field_Guide_to_Compost_Use.pdf
2. Cogger, C., & Stahnke, G. (2013). *Organic soil amendments in yards and gardens: How much is enough?* Retrieved from <http://cru.cahe.wsu.edu/CEPublications/FS123E/FS123E.pdf>

Compost Sales & Donations Review

The market review breaks down VL compost product sales and donations into two categories based on unit of measure at the time of sale/donation:

1. *Sales & Donations by Volume*: Includes all account sales (pick up from VL Compost Facility), deliveries and annual spring Free Campaigns at VL
2. *Sales by Weight*: Includes all compost purchased from VL Weigh Scales (not including Free Campaigns)

Figures 1 and 2 below provide a look at VL compost sales and donations in recent years. Limits placed on large volume sales to commercial enterprises has resulted in increased stock for Free Campaigns.

Figure 1: Sales & Donations by Volume

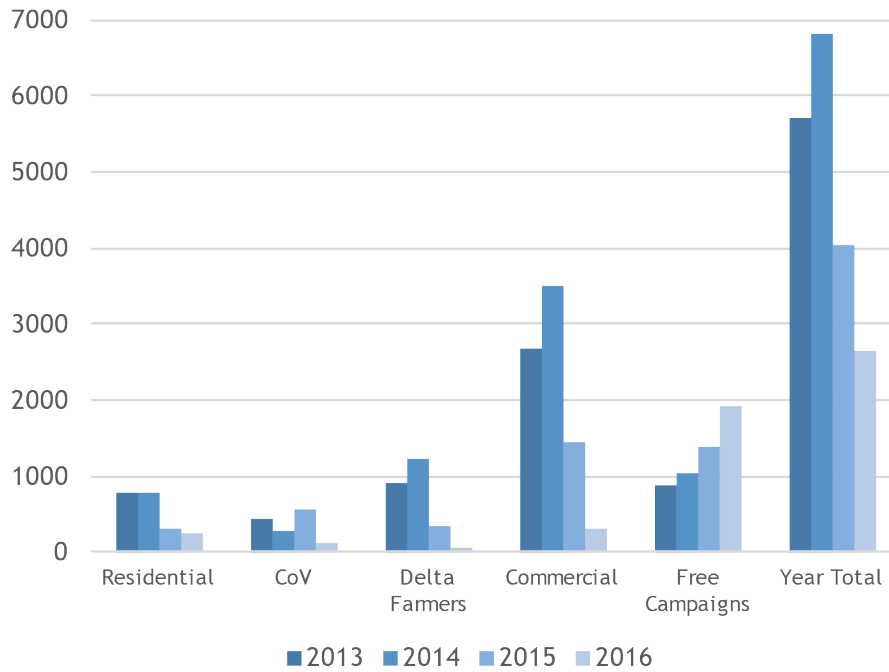
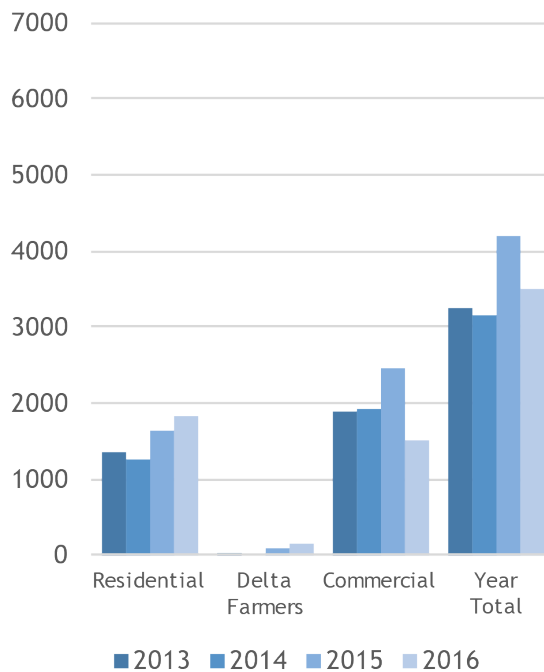


Figure 2: Sales by Weight



Compost Target Markets

The focus of sales and donations is geared towards returning the product back within the community rather than focusing on higher volume sales to commercial enterprises.

Figure 3: Target Markets by Volume

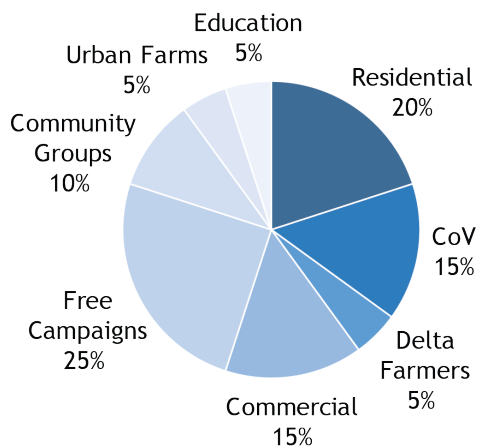
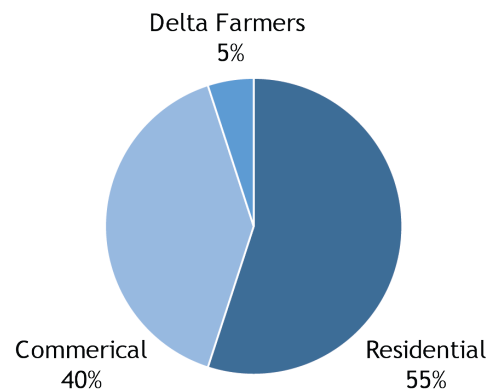


Figure 4: Target Markets by Weight



Market Expansion Opportunities

Opportunities for expanding markets for VL compost were identified based on interviews with various customer groups including community garden members, various CoV Staff involved in parks or community projects, and residents. Five opportunities are as follows:

- **Organic Materials Review Institute (OMRI) certification:** Obtaining OMRI certification would permit VL compost to be used for organic farming, but would be even more significant as a seal of quality assurance.
- **Additional Products:** Compost/sand blends, mulches, and a premium compost with less woody content are both requested by customers and within the facility's capacity
- **Educational Component:** With the majority of Delta and Vancouver schools having gardens, the opportunity arises for the VL to supply affordable compost to school garden programs while providing a platform for VL to educate on zero waste and recycling.
- **Customer Retention:** Improved communication and awareness could lead to better recognition and repeat business among groups that may not be aware they are using VL

compost (e.g., new community gardens).

- *Availability within Vancouver:* Providing the compost product at temporary depots within Vancouver would increase accessibility and demand.

Program SWOT Analysis

The strengths, weaknesses, opportunities and threats analysis was conducted in the following VL compost program areas:

- Composting process
- Finished product
- Marketing in person
- Marketing by phone
- Marketing online
- Sales & donations process
- Data management

Program Recommendations

Recommendations are provided by program area, and evaluated based on the relative time and cost projected for implementation, and overall customer impact. There is also an indication of whether the Vancouver Landfill, through Transfer & Landfill Operations (TLO), has direct control over implementation. Rankings are provided for comparison purposes only, and further analysis would be necessary to establish quantitative details.

Each recommendation is evaluated according to the ranking system in Table 4:

Table 4: Ranking System




Ranking	<i>Time to Implement</i>	<i>Costs to Implement</i>	<i>Impact for Compost Customers</i>
 Highly Favorable	<ul style="list-style-type: none"> ▪ minimal, if any 	<ul style="list-style-type: none"> ▪ minimal, if any 	<ul style="list-style-type: none"> ▪ positive impact and/or many customers impacted
 Moderately Favorable	<ul style="list-style-type: none"> ▪ moderate 	<ul style="list-style-type: none"> ▪ moderate 	<ul style="list-style-type: none"> ▪ limited impact or few customers impacted
 Unfavorable	<ul style="list-style-type: none"> ▪ significant 	<ul style="list-style-type: none"> ▪ significant 	<ul style="list-style-type: none"> ▪ neutral or negative impact or no customer impacted

Table 5.1: Composting Process

Recommendation	Time	Costs	Impact	Within VL Control?
1. Reduce contamination in feedstock				
1.1 Dispose current batch of overs that are contaminated with plastics	●	●	●	✓
1.2 Improve communication with yard waste customers regarding contamination (no tolerance)	●	●	●	✓
1.3 Charge garbage fees if yard waste is contaminated	●	●	●	✓
2. Standardize policy on street leaves				
3. Conduct additional analysis and monitoring				
3.1 Increase number of parameters and/or frequency of analyses	●	●	●	✓
3.2 Increase monitoring for temperature, moisture and stability	●	●	●	✓
4. Utilize ponds for irrigation in summer				
5. Redirect more feedstock to VL				
6. Improve source-separation education				
7. Increase annual budget				
7.1 Increase equipment maintenance frequency	●	●	●	✓
7.2 Purchase additional equipment (e.g., thermometer probes, windrow turner, oxygen meter)	●	●	●	✓
7.3 Increase Staff hours	●	●	●	✓
7.4 Pave additional areas	●	●	●	✓
7.5 Prevent birds from nesting in windrows	●	●	●	✓

Table 5.2: Finished Product

Recommendation	Time	Costs	Impact	Within VL Control?
1. Consistently cover product over winter	●	●	●	✓

Recommendation	Time	Costs	Impact	Within VL Control?
2. Offer samples and results of analysis				✓
3. Post signs at drop-offs				✓
4. Obtain OMRI certification				✓
5. Provide additional products (e.g., compost/sand mixes, mulch, and premium soil amender)				✓

Table 5.3: Marketing

Recommendation	Time	Costs	Impact	Within VL Control?
1. Equip Sales Staff with information				
1.1 Provide annual tours to Sales Staff				✓
1.2 Update information sheets				✓
2. Convey the compost story				✓
3. Improve webpage accessibility				
3.1 Improve navigation to the compost webpage within the CoV website				×
3.2 Update information				✓
3.3 Promote benefits of VL compost				✓
3.4 Provide conversion and rate charts				✓
3.5 Provide list of private haulers that can deliver compost				✓
3.6 Create generic compost email address & post online				✓
3.7 Promote no tax on sales at Weigh Scales				✓
3.8 Provide lab analyses upon request				✓
4. Provide multi-lingual info sheets				✓
5. Expand educational component				
5.1 Establish demonstration garden				✓




Recommendation	Time	Costs	Impact	Within VL Control?
5.2 Supply compost to school garden programs				✓

Table 5.4: Sales & Donations Process


































Recommendation	Time	Costs	Impact	Within VL Control?
1. Simplify the order process				
1.1 Provide instructions online				✓
1.2 Revise damage waiver wording				✓
2. Create a product name/brand				✓
3. Shift Free Campaigns to weekends only				✓
4. Promote account sign up				✓
5. Implement limits on large volume sales to commercial customers				✓
6. Improve communication with customers				✓
7. Provide pick-up outlets in Vancouver				×
8. Standardize metrics to volume				✓
9. Allocate smaller delivery trucks				✓
10. Enable payments & orders online				×

Table 5.5: Data Management

Recommendation	Time	Costs	Impact	Within VL Control?
1. Improve file and folder organization				✓
2. Update summary table when lab results are received				✓
3. Improve material tracking during Free Compost Campaigns (Vancouver & Delta)				✓

Program Documentation & Resources

The following documents and resources were created or updated during the project:

- VL compost information sheet for VL Sales Staff update
- FAQ sheet for VL compost
- Nutrient analyses spreadsheet
- Environmental trace elements spreadsheet update
- VL compost webpage update suggestions

Conclusions

Of the more than three dozen stakeholders consulted during this project, all were receptive and accommodating, especially the TLO staff that engaged throughout the course of the summer. There are quick wins in each program area that could be implemented with minimal time and resources. Some of the longer term recommendations would be addressed through the OMRI certification standards, providing an opportunity to recognize VL compost as a high quality product.