



**REPORT TO PARKS & ENVIRONMENT COMMITTEE  
MEETING OF WEDNESDAY, APRIL 24, 2019**

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**SUBJECT**     **Organics Processing – Request for Expressions of Interest – Follow-Up**

**ISSUE**

To provide the Parks & Environment Committee with additional information regarding organics composting and anaerobic digestion and to seek direction on processing technology and location for the development of a Request for Proposals (RFP) for a regional kitchen scraps processing facility.

**BACKGROUND**

At its March 27, 2019 meeting, the Parks & Environment Committee considered a report regarding the results of a Request for Expressions of Interest for a regional kitchen scraps processing facility and requested additional information with respect to composting and anaerobic digestion. This included:

- an update on the status of the Fisher Road Recycling composting facility from the Cowichan Valley Regional District, including their licence, impacts and complaints
- a comparison of typical finished compost from a standard aerobic composting facility and the compost typically produced from composted anaerobic digestion digestate, including nutrient content and value, uses and price
- a broad explanation of the difference between solid and liquid digestion
- a summary of the typical quality of and markets for compost produced from composted anaerobic digestion digestate
- a listing of commercial composting and anaerobic digestion facilities on Vancouver Island and the lower mainland, including their status (i.e., open/closed/suspended) and the type of technology used

Information pertaining to the Fisher Road Recycling facility is provided for review in Appendix A.

The consultant firm Morrison Hershfield Group (MHG) was retained to provide details of the comparisons of compost produced through standard composting and anaerobic digestion, as well as a listing of commercial composting and anaerobic digestion facilities on Vancouver Island and the lower mainland. The information compiled by MHG is provided for review in Appendix B.

According to MHG's findings, there is no substantive difference in the quality of compost produced from digestate as compared to compost from direct composting of food waste. This is supported by two different European studies, as outlined in Appendix B. The nutrient content of compost from digestate and from directly composted food waste will vary depending on the input mixture of feedstock and how it is amended by the operator. In some studies, it has been found that compost from anaerobic digestion digestate will have a much higher nitrogen content, while food waste compost will have significantly higher quantities of phosphate, potash, magnesium and sulphur. Typically, compost is blended with sand and other materials to prepare a marketable product and the compost's tested nutrient content would be used to make an appropriate blend for the market. Compost from both digestate and directly composted food waste is expected to be equally useful for this purpose. Prices for compost fluctuate but remain relatively low and it

may be expected that the value of compost from any source will be under \$50 per tonne.

Liquid (wet) anaerobic digestion is the more traditional process that has been used for decades to treat agricultural manures and wastewater treatment sludges. The desire to digest food waste has led to the development of dry (solid) anaerobic digestion systems, as wet anaerobic digestion systems require considerable pre-processing of food waste, require a very clean feedstock and generally are not suited to processing yard waste. Dry anaerobic digestion systems are designed to process feedstock with a higher solids content, such as food waste from curbside collection, and can also process yard waste and generally have a higher tolerance of contamination. For these reasons, a dry anaerobic digestion process would be most appropriate for the Capital Regional District (CRD) to manage food waste, particularly as one municipality already co-collects food waste with yard waste and at least one other is reviewing the feasibility of changing their collection service to also co-collect yard waste.

The quality of compost typically produced from composted anaerobic digestion digestate will depend on the quality of the feedstock entering the anaerobic digestion system. Like traditional composting, contamination entering a dry anaerobic digestion process will remain in the compost end product and must be screened out. Wet anaerobic digestion systems are usually sensitive to contamination and, therefore, require extensive up-front processing to remove contaminants prior to the digestion process. In general, an anaerobic digestion system utilizing clean feedstock should produce a clean, high-quality compost, assuming that the compost facility is operated according to best practices and the composting process is adapted to the type and composition of the digestate.

Information regarding the end markets for the finished compost produced by the one anaerobic digestion facility (Orgaworld) in Surrey was requested but could not be obtained.

## **ALTERNATIVES**

That the Parks & Environment Committee recommend to the Capital Regional District Board:

### *Alternative 1*

1. That staff proceed with the next steps of the process for developing an anaerobic digestion facility at Hartland Landfill;
2. That this staff report be referred to the Solid Waste Advisory Committee for feedback on the recommendations and next steps; and
3. That staff return to the Board with the results of the next steps prior to proceeding with procurement.

### *Alternative 2*

1. That staff proceed with the next steps of the process for developing a composting facility at Hartland Landfill;
2. That this staff report be referred to the Solid Waste Advisory Committee for feedback on recommendation and next steps; and
3. That staff return to the Board with the results of the next steps prior to proceeding with procurement.

*Alternative 3*

That the CRD continue to contract for organics processing from third-party facility operators in BC.

**SOCIAL IMPLICATIONS**

A Board decision to move forward with an anaerobic digestion facility at Hartland Landfill, and alignment of this project with the Board's Climate Emergency declaration, will be taken forward for a broad public education and consultation process to ensure a comprehensive understanding of any significant community concerns that might need to be mitigated during the construction and operation of a Hartland facility. Furthermore, a regional organics processing facility sited at Hartland is subject to a public consultation process under the provincial Solid Waste Management Plan (SWMP) requirements.

The CRD would also consult with municipal and private sector waste haulers to determine interest in dedicating kitchen scraps volumes to a regional processing facility. As a result of these requirements, substantial consultation will need to be completed prior to finalizing procurement for a regional anaerobic digestion organics processing facility.

Alternatively, the decision to develop a regional composting facility would require significant public education to ensure any proposed facility is clearly differentiated from odour experiences with private facilities that have operated in the region and in neighbouring jurisdictions. A significant consultation process would likely be required to address concerns that would be raised.

**ENVIRONMENTAL IMPLICATIONS**

Kitchen scraps processing technology and facility location both have the potential to influence environmental impacts. Any in-region facility, regardless of technology, would be subject to various regulations and enactments, such as the BC Organic Matter Recycling Regulation and, in the case of a composting facility, the CRD composting bylaw. These regulations mandate environmental assessments and controls, including leachate, odour, vector, litter and dust management plans. Both anaerobic digestion and composting should be able to meet regulatory requirements for environmental management, provided they follow best practices for design, construction and operation.

The diversion of kitchen scraps from disposal at the landfill will result in environmental benefits, including landfill space savings, greenhouse gas reductions and resource recovery. Both anaerobic digestion and composting will produce nutrient-rich soil amendments, while anaerobic digestion alone will produce biogas that can be utilized to displace the use of fossil fuels. These implications will be more fully determined by the results of the RFP process.

Kitchen scraps processing by anaerobic digestion best supports the Board's objective to achieve regional carbon neutrality by 2030 and the production of renewable energy from waste in response to the Climate Emergency Declaration. Anaerobic digestion results in the creation of biogas, which can be upgraded into renewable natural gas. A separate report regarding the development of a renewable natural gas facility at Hartland is on this meeting's agenda. There are strong synergies between the development of an anaerobic digestion facility and a renewable natural gas facility at the Hartland Landfill location.

### **ECONOMIC IMPLICATIONS**

The transfer station at Hartland Landfill currently accepts source-separated kitchen scraps at \$120 per tonne. The cost to the CRD to have kitchen scraps hauled off site and processed is currently \$145.89 per tonne. It is estimated that the disparity between the tipping fees charged will cost the CRD a net of approximately \$400,000 in 2019.

The economic implications of a long-term, in-region facility will be determined with the results from an in-region kitchen scraps processing consultation with municipal/industry waste haulers and it is determined if participants would be willing to commit to paying the tipping fee associated with a successful RFP.

Composting operations have lower capital and operating costs than anaerobic digestion facilities. Capital costs for kitchen scraps processing range from an estimated \$2 million to \$8 million for composting and from \$25 million to \$40 million for anaerobic digestion, depending on size and the specific technology used.

Gross operating costs for a composting facility are estimated to range from \$60 to \$100 per tonne, depending on the quantity processed and technology used. Gross operating costs for an anaerobic digestion processing facility are estimated to range from \$100 to \$135 per tonne, depending on technology and the quantity processed. However, the higher costs of anaerobic digestion can be significantly offset by revenues generated from the sale of the biogas produced through the anaerobic digestion process. Composting cannot be expected to generate any revenues other than tipping fees charged.

### **FEEDSTOCK IMPLICATIONS**

Most kitchen scraps collection programs in the region currently accept source-separated kitchen scraps. The District of Saanich co-collects residential kitchen scraps with yard and garden material. Staff from other municipalities have indicated they are considering modifying their kitchen scraps collection to also include yard and garden material in the future. As a result, the type and ratio of organic feedstocks supplied by municipal participants, discussed as part of the collaborative RFP process, will potentially impact processing technology performance.

### **STAKEHOLDER IMPLICATIONS**

Long-term options arising from the RFP process will be presented to CRD municipalities and private haulers, specifying the preferred technology and expected user fees, to allow them to determine whether they will commit to delivering kitchen scraps to the processing facility.

Stakeholder consultation will be conducted with both the local and regional community, including First Nations, regarding the location of a kitchen scraps processing facility at Hartland Landfill.

### **SOLID WASTE MANAGEMENT PLAN IMPLICATIONS**

The opening of an in-region organics processing facility would require an amendment to the SWMP with public consultation. Staff are currently working on developing a new SWMP, which is anticipated to proceed to public consultation in the fall of 2019. It is anticipated that there will be an opportunity to consult on the new facility in the overall SWMP engagement process. Regardless, a targeted separate amendment may have to be pursued, if there is a desire to move forward with the facility prior to final approval of the CRD's new SWMP.

The facility would form part of the overall solid waste management system and any financial implications related to the project would have implications on the overall solid waste financial model.

### **NEXT STEPS**

Implementation of the kitchen scraps processing procurement process, based on Board direction, includes:

- secure municipal tonnage commitments
- kitchen scraps consultation process
  - public education on chosen technology
  - issue identification and mitigation
- finalize shortlist recommendation from Request for Expressions of Interest
- apply for targeted SWMP amendment, if required

### **CONCLUSION**

The additional information provided in this report concludes that properly operated composting facilities should be able to process either digestate or food waste and achieve a high quality compost with no substantive difference in finished compost quality. Dry anaerobic digestion is a more suitable technology compared to liquid anaerobic digestion for processing food waste mixed with yard waste. The systematic development of an anaerobic digestion organics processing RFP, in consultation with solid waste collection providers and the community, has the best potential for facilitating the development of a long-term, sustainable and cost-effective processing facility in-region. In addition, an anaerobic digestion facility, and its associated biogas production, is directly aligned with the Board's objective to achieve regional carbon neutrality by 2030 through the production of renewable, alternative fuel.

### **RECOMMENDATION**

That the Parks & Environment Committee recommend to the Capital Regional District Board:

1. That staff proceed with next steps of the process for developing an anaerobic digestion facility at Hartland Landfill;
2. That this staff report be referred to the Solid Waste Advisory Committee for feedback on recommendation and next steps; and
3. That staff return to the Board with the results of the next steps prior to proceeding with procurement.

Submitted by:	Tom Watkins, Acting Senior Manager, Environmental Resource Management
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

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Attachments: Appendix A – Additional Information on Fisher Road Recycling  
Appendix B – Additional Information on Composting and Anaerobic Digestion  
Facilities