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ERM 21-14

**REPORT TO ENVIRONMENTAL SERVICES COMMITTEE
MEETING OF WEDNESDAY, APRIL 21, 2021**

SUBJECT **Organics Processing Next Steps**

ISSUE SUMMARY

To provide a recommendation on next steps regarding an in-region organics processing facility.

BACKGROUND

At its meeting of March 13, 2019, the Capital Regional District (CRD) Board directed staff to proceed with the next steps in establishing an organics processing facility (either composting or anaerobic digestion (AD)) at Hartland Landfill. In response to this direction, staff have undertaken stakeholder consultation with municipalities and private haulers to better understand feedstock availability, have conducted a market sounding with respondents to the 2018 Request for Expressions of Interest (RFEOI) on in-region organics processing alternatives and completed a financial and environmental screening on RFEOI results.

ALTERNATIVES

Alternative 1

The Environmental Services Committee recommends to the Capital Regional District Board:

That the Capital Regional District continue with the status quo of hauling and processing organics to private sector facilities on lower/mid-island, and signal to the market, through this resolution, that should the private sector establish an in-region facility, the Capital Regional District would consider working with municipalities to commit feedstock, pending pricing, greenhouse gas reductions, odour, location, and other environmental considerations.

Alternative 2

That staff continue working towards developing a Capital Regional District led small scale organics processing facility located at Hartland Landfill, and return to the Environmental Services Committee for a decision on technology selection (composting vs anaerobic digestion) and municipal funding before initiating next steps on procurement.

IMPLICATIONS

Intergovernmental Implications

Consultation was undertaken with staff in the six municipalities that currently provide curbside collection services, along with private haulers currently using the Hartland transfer station, to determine feedstock availability and interest in participating in a CRD-led in-region organics processing facility. Key findings of this consultation include:

- Esquimalt, Oak Bay, Sidney, View Royal, Saanich and Victoria have organics collection programs. The majority of municipal controlled feedstock (approximately 88%) comes from the District of Saanich and City of Victoria.
- Of the municipal feedstock available for an in-region organics facility, the majority (approximately 65%) is yard and garden waste. The remaining is kitchen scraps.
- The District of Saanich currently co-collects kitchen scraps with yard and garden waste, and the City of Victoria is actively exploring the co-collection option. It would be challenging and costly to shift operations to separated streams, and doing so could result in potentially higher greenhouse gas (GHG) emissions and decreased service levels for residents. Therefore, it would be advantageous for any CRD-led processing option to be able to process mixed feedstock.
- Private haulers currently haul approximately 13,000 tonnes of organic material to the Hartland transfer station annually. Private haulers confirmed that they are not in a position to make long-term feedstock commitments to a Hartland project, and will haul feedstock to whatever transfer station provides the most cost effective option. The current tipping fee at Hartland is \$120/tonne. The Board has approved raising this to \$140/tonne beginning January 2022, which staff anticipate will reduce the volume of private sector material being received at Hartland.

Table 1: Approximate Feedstock Collection in 2019

Feedstock Source	Tonnes per year
Municipal Kitchen Scraps	4,000
Municipal Yard and Garden Waste	10,800
Municipal Mixed Organic Waste (50/50 Kitchen scraps and Yard Waste)	9,000

Through the consultation, municipal staff indicated they would be interested in learning the results of a non-binding procurement, including understanding the cost per tonne of processing organics material, before municipalities make commitments on tonnages of kitchen scraps, yard and garden waste, or both substrates. Municipal staff also indicated that potential reduction in GHG emissions should be considered when evaluating technology alternatives and procurement outcomes.

Financial Implications

The CRD retained Deloitte to conduct a market sounding with RFEOI respondents to better understand market conditions for constructing a facility at the Hartland Landfill and clarify results of the RFEOI submissions. Results of the market sounding, coupled with RFEOI results, were then used by Reshape Strategies to evaluate potential costs and environmental benefits of an organics processing facility located at Hartland (either composting or AD), against the status quo alternative of operating a transfer station at Hartland and processing materials out of region. Results of Reshape’s analysis are included in this report as Appendix A.

The Reshape analysis considered two feedstock scenarios intended to ‘bookend’ the range of feedstock availability, both assumed feedstock ratio of 70% kitchen scraps, 30% yard and garden waste:

- Scenario 1: A Small Plant with capacity for a flat volume of 10,000 tonnes per year (i.e. no change over time).
- Scenario 2: A Large Plant with starting capacity volume of 24,700 tonnes per year in 2024, increasing at 1% per year.

The CRD’s 2018 RFEOI provided Scenario 1 as a guaranteed, baseline volume, and Scenario 2 as a potential volume. The CRD’s consultation identified that municipalities currently collect much higher volumes of yard waste to kitchen scraps and currently control approximately 8,500 tonnes of kitchen scraps, making the Small Plant scenario most closely aligned with currently available feedstock blend. Both composting and AD facilities can conceivably take different blends of feedstock, and further analysis would be required to understand how feedstock blends would impact the overall business case.

The Reshape analysis then evaluated the RFEOI results to identify a levelized net processing cost (\$/tonne) for three processing alternatives:

- **Status Quo:** organic material received at Hartland is trucked to third party composting facilities out of region under a contract to the CRD. The analysis assumes that current per tonne processing costs (including transportation) continue into the future, with an annual escalation.
- **Composting:** organic material received at Hartland is processed in a new dedicated in-vessel composting facility located at Hartland. Expected revenues from compost sales are included in the calculation of net processing cost to the CRD.
- **Anaerobic Digestion:** organic material is processed in a new AD facility located at Hartland. The AD facility does not include a biogas upgrader. Instead, biogas from the AD facility is sent to the landfill gas upgrader and renewable natural gas (RNG) is sold to FortisBC under the same terms and prices as RNG from landfill gas.

All alternatives consider a 20-year project life. Results of Reshape’s Analysis are summarized in the table below.

Table 2: Levelized Net Processing Costs (\$/tonne)

Annual Volume	Small Plant (10,000 tonnes fixed)	Large Plant (24,000 tonnes increasing 1%/year)
Processing Capacity	10,000 tonnes	30,000 tonnes
<i>Levelized Net Processing Costs (\$/tonne)</i>		
Status Quo (composting out of region)	\$168	\$168
Composting (at Hartland)	\$240	\$150
Anaerobic Digestion (at Hartland)	\$276	\$148

This analysis found that a smaller-sized composting facility located at Hartland, utilizing only the feedstock currently available from municipalities, would not be cost competitive against the status quo option of hauling kitchen scraps to a large out of region facility for composting (\$240/tonne vs \$168/tonne). However, a small Hartland AD plant with a \$108/tonne cost premium (\$276/tonne vs \$168/tonne or \$1.08million/year) could be economic if enough value was placed on the GHG benefits associated with an AD facility.

At larger scales, either composting or AD at Hartland could be cost competitive, or even result in cost savings when compared to the status quo option. As there isn't sufficient municipal tonnage to fully supply a larger facility (assuming a 70% kitchen scraps, 30% yard and garden waste ratio), a CRD/Hartland facility would require feedstock from other sources.

Environmental & Climate Implications

The Reshape analysis also considered the GHG implications of each of the three processing scenarios. Results of this evaluation are included in Table 2, below.

Table 3: Operating GHG Emissions (kg/CO₂-e/tonne feedstock/year)

	Status Quo	Composting (at Hartland)	Anaerobic Digestion (at Hartland)
Transport emissions	10.7	-	-
Composting	90.0	90.0	9.0
Shipping Compost	9.7	9.7	1.0
Other Operations	45.8	45.8	48.0
RNG- pipeline fugitive	-	-	0.2
Net Avoided Natural Gas	-	-	(49.5)
Total	156.1	145.5	8.7

This analysis found that building a new dedicated composting facility at Hartland would result in a very small decrease in cumulative emissions compared to status quo, however building a new dedicated AD facility at Hartland would result in significantly higher GHG emission reductions. This is because biogas produced by the AD facility would result in net avoidance of natural gas. As organics are already kept out of the landfill, the Reshape analysis excludes emissions reductions from avoiding landfilling in all scenarios. There are substantial differences in GHG (CO₂-e) emissions among the alternatives. In particular, AD alternatives result in net reductions of 40,000 – 100,000 tonnes of GHG (CO₂-e) over 20 years compared to composting.

Based on the Reshape analysis, reducing GHG emissions by building a small scale AD facility at Hartland results in a cost premium of \$1,080,000/year or a \$515 per tonne of CO₂-e value of carbon. For comparison, the current BC carbon tax is \$45/tonne and Metro Vancouver recently adopted an internal price of carbon policy of \$150/tonne.

Social Implications

Staff also evaluated the current and future planned processing capacity for organic materials on Southern/Mid Vancouver Island. There is currently excess private sector compost processing capacity on Southern/Mid Vancouver Island with three on-island facilities that have the ability to receive and process CRD combined kitchen scraps and yard waste, with an approved annual capacity of 71,500 tonnes, and an additional 44,000 tonnes of capacity currently under construction at the Circular Waste BC facility in Nanaimo, bringing the total annual capacity up to 115,500 when complete. Additionally, there are well-established alternatives for processing yard and garden waste within the capital region. There are no AD facilities on Vancouver Island with

capacity for the CRD organic material. If the CRD were to construct a Hartland facility, this facility would compete for feedstock with out of region composting facilities, and in-region yard waste processing facilities.

Solid Waste Management Plan Implications

The Solid Waste Management Plan Phase two consultation identified both support and opposition for siting an organics processing facility at Hartland Landfill. In their formal response, District of Saanich requested that the draft Solid Waste Management Plan reference the additional benefits a regional organics processing facility would have associated with the GHG emissions savings from the reduced transportation of organics outside of the region. City of Victoria identified organics diversion as a priority strategy to support the City’s Zero Waste strategy.

The final draft Solid Waste Management Plan indicates that the CRD intends to continue to provide the community with receiving and transport services for kitchen scraps through the transfer facility at Hartland while monitoring in-region and on island organics processing capacity. In response to a need to secure additional processing capacity for the community, the plan also indicates that a facility at Hartland may also be pursued in an effort to reduce the GHG emissions associated with the current transportation and processing model.

CONCLUSION

Staff have undertaken stakeholder consultation with municipalities and private haulers to better understand feedstock availability, have conducted a market sounding with respondents to the 2018 RFEOI on in-region organics processing alternatives and completed a financial and environmental screening on RFEOI results. This evaluation found that there are economies of scale when considering organics processing alternatives against the status quo, that municipalities control limited feedstock, and that an organics processing facility would need to compete for feedstock with the Private Sector, however that building an AD facility at Hartland would result in GHG emissions reductions.

RECOMMENDATION

The Environmental Services Committee recommends to the Capital Regional District Board:

That the Capital Regional District continue with the status quo of hauling and processing organics to private sector facilities on lower/mid-island, and signal to the market, through this resolution, that should the private sector establish an in-region facility, the Capital Regional District would consider working with municipalities to commit feedstock, pending pricing, greenhouse gas reductions, odour, location, and other environmental considerations.

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ATTACHMENT

Appendix A: Organics Processing Options: Screening Report (Reshape)