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TO: Chair and Directors
Comox Strathcona Waste Management Board

Supported by James Warren
Deputy Chief Administrative
Officer

FROM: James Warren
Deputy Chief Administrative Officer

J. Warren

RE: Final Report – Rural and Remote Communities Composting Pilot Program

Purpose

To outline the key findings from the remote organics compost pilot, launched by the Comox Strathcona Waste Management (CSWM) service in 2019, and to provide recommendations to address food waste and food loss within the CSWM service moving forward.

Recommendation from the Deputy Chief Administrative Officer:

THAT the Comox Strathcona Waste Management community education program includes education for rural and remote residents regarding the importance of food loss and food waste, and provides composting options to manage organics successfully at home;

AND FURTHER THAT the Comox Strathcona Waste Management service continues to support the existing pilot compost programs where there is interest and community buy in and support; and

AND FINALLY THAT the Comox Strathcona Waste Management service provide staff resources to work with individual remote communities that have an interest in developing and establishing an organics management program, based on the unique and specific needs of each community.

Executive Summary

At its June 2019 board meeting, the CSWM Board approved implementation of a remote organics composting pilot program in the Village of Tahsis and on Cortes Island to gather information regarding volumes, technology, cost, participation and viability of remote composting facility options. The pilot program was developed around the use of the Joracan tumbler composter as this unit was considered cost effective, easy to operate and an appropriate size for small communities. The pilot also relied heavily on the voluntary participation of residents to transport their food waste to the composter, or relied on a community organization to coordinate feedstock and operate the composter. Key findings from the pilot are summarized here:

- COVID-19 had a major impact on implementation as residents may have been reluctant to participate in the voluntary delivery of food waste to the composter. Similarly community organizations either shutdown or scaled back during COVID, impacting the pilot programs in place. COVID also affected the CSWM staff's ability to host public engagement sessions.
- Remote communities have diverse goals and preferences for managing their organics, and therefore, composting programs and the type of composter are not one size fits all. While the Joracan composter was successful in one community, it did not meet the needs nor composting preference in other communities. In order for composting programs to run successfully, dedicated staff with sufficient oversight to manage the programs is required.

Thorough engagement with each community is required in order to develop a tailored program that meets their specific goals and composting preferences, while maintaining cost efficiency for the user.

- Regardless of the composting technology or funding provided for establishing programs, community buy in is critical to successful composting programs. In addition to community buy in, the convenience of organized collection or centralized drop-off of food waste is a key consideration. However, despite the varied approach in each of the pilot communities, participation continues to be low ranging from 3 to 17 per cent.
- Although some food waste is unavoidable (bones, peelings), the best solution to make the largest initial impact, is to educate residents to avoid food waste and to utilize affordable methods to address the food waste residuals. This is supported in the CSWM Solid Waste Management Plan, through the guiding principle of setting sustainable consumption levels.

There are a number of ways to manage and mitigate the environmental and financial effects of food waste within remote and rural areas of the CSWM service. The following recommended options are provided in a specified order to achieve the greatest impact to minimize food loss and food waste. Once all achievable opportunities at a higher level have been taken, only then should the next level be explored.

- 1) Continue promoting the Love Food Hate Waste Canada program to educate residents on the environmental and financial importance of avoiding and managing food waste.
- 2) Collaborate with existing and well established organizations who currently operate composting or educational agricultural programs within the area, collect materials from residents for use in existing programs either via centralized collection or a community collection program, educate residents on sustainable food production, organic farming practices and assist with troubleshooting issues for residents or remote communities who need support.
- 3) Provide dedicated staff to work with residents, municipalities and jurisdictions to support the establishment of backyard or municipal composting programs that will fit the needs and desires of each community, where necessary, provide support through the process, including troubleshooting.
- 4) Investigate the provisions for a composter purchase rebate program as way to encourage residents to manage their own food waste and to support those who already compost at home. Further work will be required to establish the funds required for consideration in the 2023 – 2027 CSWM financial planning process, based on interest and qualifying composters that meets the unique needs of remote communities.
- 5) Evaluate the composting options as part of the new transfer stations, including onsite composting, to be considered within the context of the CSWM Solid Waste Management Plan update that is forthcoming. Work with residents to engage, educate and leverage their motivations to reduce waste.

Prepared by:

Concurrence:

Concurrence:

V. Schau

M. Rutten

Stephanie Valdal
CSWM Services Coordinator

Vivian Schau
Senior Manager of
CSWM Services

Marc Rutten, P.Eng
General Manager of
Engineering Services

Government Partners and Stakeholder Distribution (Upon Agenda Publication)

Strathcona Regional District	✓
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Background/Current Situation

At its June 20, 2019 board meeting, the CSWM Board passed the following resolutions:

THAT the Comox Strathcona Waste Management Board approve the implementation of a remote community's organic composting pilot program in the Village of Tahsis and within Electoral Area B of the Strathcona Regional District, being Cortes Island.

AND FURTHER THAT the Comox Strathcona Waste Management Board approve the purchase of composting equipment and supplies to operate the pilot in the two remote communities of the Village of Tahsis and Cortes Island up to a maximum of \$10,000.

AND FINALLY THAT staff report back to the Comox Strathcona Waste Management Board at its September 2020 meeting, with a summary and business case for a small scale organic composting program, for all remote communities that wish to participate.

Per board direction, the CSWM service initiated the remote organics composting pilot program (Program) in the Village of Tahsis and Linnaea Farms, Klahoose First Nation, Cortes Island School on Cortes Island. The Program subsequently expanded to Homalco First Nation in Campbell River. Data collected from the pilot also incorporates composting activities currently taking place at the local school in the Village of Zeballos.

The participating communities/farm were provided a Joracan tumbler vessel composters (Joracan composter), selected for its bear proof properties, insulation to effectively compost in any climate and its ability to finished a batch of compost in as little as six to eight weeks. Each Joracan composter can manage food waste from 40 households, which made the unit a nice fit for smaller communities.

Of particular interest to staff was how much food waste remote residents were actually generating and if it was consistent with information from Love Food Hate Waste Canada; which indicates one in four bags of groceries purchased is thrown away. A 2019 report from Environment and Climate Change Canada, found this equates to 79 kg of food waste annually, sixty three per cent of which could have been consumed. Results from the pilot indicated that on average, remote residents generate 36.84 kg of food waste annually. For a community like the Village of Tahsis, this equates to approximately 11 tonnes a year.

A detailed summary of activity, information gathered and recommendations for the individual pilot programs can be found in Appendix A.

Options

There are multiple options to manage and mitigate food waste and food loss within the CSWM service, which can be utilized by any community, either on its own or in conjunction with others as a holistic approach. It is important to note, the Province of British Columbia states that “preventing food from being wasted in the first place is the best solution” and is the highest level of the 5R pollution prevention hierarchy. In addition, diverting food waste to compost is better than landfilling, but preventing food waste from being wasted is an even better way to lessen the environmental impact. As such, the following options are provided in a specific order to achieve the greatest impact to minimize food loss and food waste.

All of the options below require engagement with residents, to ensure support for new programs and allow for proper buy in which will lead to increased participation and reduction of organics in the waste stream:

- 1) Promoting of the Love Food Hate Waste Canada program to educate residents on the importance of avoiding food loss and managing food waste, is an excellent approach to reducing the financial and environmental impact of managing an additional waste stream. Environmentally, this has the largest impact, as it reduces the loss of resources associated with growing food that is discarded rather than consumed.
- 2) Collaborating with existing and well established organizations who are currently operating programs within the area, such as Linnaea Farms, to collect materials from residents for use in existing composting processes, educate residents on sustainable food production, organic farming practices and provide information for residents who wish to compost at home.
- 3) Providing dedicated staff that can work with remote and rural communities to support the establishment of composting programs that will fit the needs and desires of each community and provide support through the process, including troubleshooting. In addition, staff can assist with distribution of educational materials, engagement with residents and provide support to individual residents who wish to compost at home via a compost champion within each participating community.
- 4) Providing composter rebates to residents who purchase a qualifying composter is a good way to encourage residents to manage their own food waste. This saves the additional capital infrastructure costs and costs associated with transporting and managing an additional solid waste stream for the CSWM service. This will reduce tipping fee costs for resident and GHG emissions from landfilling food waste. The key to success is through the identification of a local compost champion, supported by CSWM, to educate and assist residents with troubleshooting issues at the community level. Further work will be required to establish the funds required for consideration in the 2023 – 2027 CSWM financial planning process, based on interest and qualifying composters that meets the unique needs of remote communities.
- 5) Evaluating the composting options as part of the new transfer stations, including onsite composting, to be considered within the context of the CSWM Solid Waste Management Plan update that is forthcoming.

Financial Factors

According to Love Food Hate Waste Canada, residents throw away \$1,100 in edible groceries each year by not being mindful of what they are purchasing, what is spoiling, how to store food properly and how to utilize food that may be going bad. As part of the Village of Tahsis pilot, staff incorporated Love Food Hate Waste Canada promotional materials, which were well received by residents, especially those experiencing financial insecurities. However, not all residents are fully motivated by environmental change. By utilizing financial incentives, it is another tool that can be used to promote waste diversion within the CSWM service.

With the pending closure of the Zeballos and Tahsis landfills and the transition to the transfer station model, the CSWM service will incur additional transportation costs for the transfer of waste to the Comox Valley Waste Management Center for final disposal and the Village of Tahsis will incur tipping fee costs. By engaging with residents now, the service has a unique opportunity to generate buy in from the public and promote further diversion in these areas, reducing the volume of material generated and transported.

Although there will be initial costs to the CSWM service for establishing engagement programs and solutions for organics management within each service area, it is important to note that each community will be required to provide the labour associated with running and promoting the programs. Through the pilot, staff were able to estimate the level of involvement required to operate the Joracan program was one hour per week at its lowest and 3 hours per week at its peak.

Unfortunately, the CSWM found it is not possible to operate long term programs utilizing volunteers within the community. As demonstrated through the pilot, consistency is key to the success of any composting program, as lack of participation and oversight could lead to program failure.

The CSWM service is interested in mitigating costs whenever possible and there is little benefit to establishing composting programs in communities where there is little participation. The pilot found a participation rate of 3 to 17 per cent. In communities where population is very low, providing compost rebates or working with existing programs within the community is a great alternative way to get residents involved in composting. This would be a successful method to address organics diversion and should be complemented with education and troubleshooting support to ensure success.

Intergovernmental Factors

Each of our remote communities is diverse and each have different goals for managing waste, including organics. The pilot demonstrated that these types of programs are not one size fits all. There are communities within the CSWM service that have not expressed interest in composting and there are communities who are already running successful programs on their own and do not require any support from the service. Communities also differ in vector issues, population, access to public works staff and the goals for composting programs are also very different. In order for programs to run successfully, dedicated staff and sufficient oversight to manage the programs are required. Discussions with each jurisdiction is also required to tailor a program that will work best for each area, identify the number of residents who are already composting at home, while maintaining cost effectiveness for the tax payer through programs that will actually be utilized by residents.

Eventually, once there is significant buy in from the public, municipalities and jurisdictions with curbside garbage services can consider implementing organic waste bans at the curb, to increase the volume of material for composting and reduce volume of organics in the waste stream. Without proper buy in from the public in advance, most programs will fail due to lack of participation and opposition from residents. Communities with residents that understand the financial and environmental value in composting, will have higher participation over a longer period of time.

Interdepartmental Involvement

CSWM staff can work with the Comox Valley Regional District communications support staff to develop an engagement program to support residents and remote communities to develop tools unique to each jurisdiction, while ensuring a consistent overall message to encourage prevention of food waste. A tailored approach to choosing appropriate technologies or composting systems, will support the success of the programs and reduce the amount of staff time required to operate the programs. In addition, engagement with residents ahead of time will increase willingness to participate and lead to the greater success.

Citizen/Public Relations

Residents, regardless of proximity to grocery stores and composting facilities, generate organic waste that should be diverted from landfill. Regardless of technology method chosen for composting programs or money contributed to establishing programs, community buy in is the key to successful composting programs. Without participants contributing food waste to composting programs, the programs will not accomplish the goals of diversion. Organic bans at the curb can be a tool utilized by municipalities to increase participation, but still require buy in from residents or they will not be supported.

Education and engagement is key to increasing organics diversion and a comprehensive public engagement tool should be established prior to launching any organics programs within the remote

communities. The best method for addressing food waste diversion from landfill is for residents to not produce food waste to begin with. Although some food waste is unavoidable (bones, peelings), the easiest solution to make the largest initial impact, is to teach residents to avoid food loss to begin with and utilize affordable methods to address the food waste residuals.

Attachments: Appendix A – Summary of Activity

Appendix A – Summary of Activity

Village of Tahsis

Key Stakeholders:

- Tahsis Community Garden Society (TCGS)
 - The CSWM service initially planned to run the pilot with assistance from the TCGS. The TCGS withdrew from the program as a result of COVID and change of membership/direction of the society.
- Tahsis public works staff
 - The public works staff took over the pilot following council direction. The time commitment to run the pilot was between 4-11 hours per month.
- Participants
 - Staff secured participants through a mail out and worked with residents to perform the duties of weighing organics, recording weights and adding carbon to the composter and public works staff were able to provide oversight, take temperatures and troubleshoot. The Tahsis pilot initially started with 11 participants, at its peak the pilot included 21 residents, three of which never participated.

Key Drivers and Considerations:

- TCGS were concerned with food sustainability and wanted to generate compost for growing food within Tahsis.
- Tahsis public works staff wanted to ensure sufficient and safe access to the Joracan composter, as some residents do not travel to landfill and there are ongoing wildlife concerns. The Joracan composter was situated inside a shipping container at the public works yard, located adjacent to the bear proof garbage bins and recycling depot.
- Tahsis council was particularly interested in the ability to manage yard waste through the program, which could provide the carbon required to mix with the food waste to support the composting process.

COVID Impacts:

- Due to COVID, the TCGS ceased all meetings in February 2020 and withdrew from its participation.
- Staff modified the Pilot, which was approved by Tahsis council, and relaunched the Pilot in November 2020.

What Worked Well:

- Housing the Joracan composter inside the shipping container was effective in deterring bears from the composter and there were no reports of wildlife interactions. However, the bears continued to access the garbage in the adjacent bear proof bins.

What Did Not Work Well:

- Majority of the public works staff's time was spent handling the condensation and effluent from the Joracan composter as well as trouble shooting issues.
- The organics waste stream did not compost properly due to lack of control/unlimited access to the Joracan composter by public resulting in non-registered participants placing materials into the composter without proper guidance, specifically:
 - Uncut and unacceptable food items like whole melons, grease and soap; and
 - Improper ratio of carbon and nitrogen required for the composting process

Key Findings and Recommendations:**1) Food sustainability and Yard Waste Management**

Based on population and the amount of food waste generated in Tahsis, there is insufficient finished compost to address the food sustainability concerns of the community. In addition, the amount of yard waste generated far exceeds the carbon/nitrogen ratio required to successfully compost the volumes of chipped yard waste produced by the community, with the low volume of food waste. Even with every resident, restaurant, business and school contributing food waste, there would still not be enough food waste to compost the volume of yard waste generated, which does not address the concerns of council. However, mixing backhauled net zero compost with chipped wood from Tahsis could be a possible solution to utilize the yard waste.

2) Alternative Composting Solution

To address the food sustainability concerns raised by TCGS, utilizing a fermentation anaerobic system or vermicomposting for managing food waste in Tahsis may be a more appropriate composting method as it would provide a higher nutrient concentration in the finished product. Mixing the residuals from the fermentation process, with net zero compost and chipped yard waste may be the most suitable option to meet all the Tahsis' needs for diverting organics from the waste stream. The process of fermentation can be performed in five gallon lidded buckets or repurposed blue barrels (collected from ocean debris clean up events and can be redistributed free of charge to Tahsis) and would require less labour, less capital costs, while maintaining the convenient residential drop off at the public works yard. With the exception of staff time to move and empty the barrels at the landfill for curing, there is no cost to operating this type of composting system. It is highly recommended that this operation be conducted behind a bear fence to reduce wildlife interactions and prevent bears from accessing the finished material. Tahsis is in a fortunate position to already have educated staff who are well versed and can help troubleshoot this type of composting method. Tahsis also has a coffee bean roaster located in the Village, who's residual waste bi-product would provide an excellent option for assisting with the fermentation process of organics, as an alternative to purchasing bran or yeast to promote fermentation.

Campbell River – Homalco First Nation***Key Stakeholders:***

- The CSWM service delivered Joracan composters to the community of Homalco First Nation (Homalco) in May 2020 and hosted a composting workshop on June 28th 2020 with Homalco residents.

COVID Impacts:

- Due to COVID, the community did not feel comfortable launching the curbside collection program and could not find anyone interested in staffing the position for collection of the material. The community was also closed to visitors during COVID.

Key Findings and Recommendations:**1) Partnership with the City of Campbell River**

While the pilot was not successful, the CSWM service was able to initiate discussions with the City of Campbell River for consideration of adding Homalco to the City's curbside

program, which will eventually lead to compost collection at the curb. Staff will continue to work with Homalco to further the discussion on this possible solution. The Joracan composters may be available to utilize in another community or rural school within the CSWM service and staff would like to explore the option of providing a unit to the local school in Kyuquot.

Cortes Island – Klahoose First Nation

Key Stakeholders:

- Klahoose First Nation (Klahoose)
 - 75 permanent residents living in the community
- Klahoose community staff members

Key Drivers and Considerations:

- The Klahoose community wanted to establish a curbside collection for garbage, recycling and organics. The community purchased a vehicle to be used for collecting the three waste streams at the curb and established a paid position for the collection service.
- Due to delays in the delivery of the collection vehicle, the curbside program did not launch until fall 2020, but the Joracan composter was utilized immediately on a drop off basis by community members and staff.

COVID Impacts:

- The Klahoose community attributed the low participation and significant program delays to launching the Pilot to COVID.

What Worked Well:

- The Joracan composter is located within the fenced community garden, in full sun. It has worked effectively with no issues and did not require any troubleshooting throughout the Pilot. The community has subsequently purchased additional units for use in the community.
- Although initial participation was low prior to initiation of curbside collection, the success of the Pilot in Klahoose can be attributed to:
 - the Joracan composter being appropriately sized for the community;
 - having dedicated staff to operate the Pilot by monitoring and adjusting materials going into the composter;
 - collecting materials at the curb and having overall control of the mixture to maintain proper carbon/nitrogen ratio.
- Overall, largely attributed to the higher level of oversight and restricting involvement from non-participating members, the Pilot has been very successful and is a good fit for the community. The community has the largest participation level at seventeen per cent.

What Didn't Work Well:

- Although the community has the largest participation over all they are still not satisfied with the level of participation. The Klahoose administration issued branded promotional materials and provided prizes for participating residents, however they are still hoping to increase participation over time.

Key Findings and Recommendations:**1) Oversight by Dedicated Staff**

Dedicated staff provide many benefits to composting programs as they are the first line of observation and can communicate changes in composting behavior that may need to be relayed to Pilot participants.

2) Participation

To encourage participation in the composting program, Klahoose aims to continue to issue branded educational/promotional materials and include their native language, Eyajuuthm. Staff are recommending supporting Klahoose with seasonal promotional materials to encourage increased participation in the program.

Cortes Island – Linnaea Farm***Key Stakeholders:***

- Linnaea Farms (Linnaea) is a long standing non-profit in the community, that consists of a 314 acre farm and organic farming/composting education center.

COVID Impacts:

- Due to COVID, the Pilot was never initiated at Linnaea, which was closed for a large portion of 2020 and the CSWM service was unable to conduct site visits.

Key Findings and Recommendations:**1) Alternative Composting Solution**

Linnaea's composting preference is anaerobic fermentation and the vermicomposting process. The farm decided to purchase a worm bin for use rather than utilizing the Joracan composter supplied by the CSWM service. Although it is unfortunate that the Joracan did not meet the needs of Linnaea, this is an example of how the one size fits all approach is not always effective and can result in failure or loss of interest in participation when more suitable options may exist.

2) Future Collaborations

Linnaea supports backyard composting and food sustainability for Cortes Island residents through workshops and engagement on sustainability and agricultural practices. The CSWM service could explore potential collaborations opportunities with Linnaea, specifically through their education center, to further encourage participation in their workshops by residents. This would not only benefit the residents who are already composting, but the farm and local eco-tourism opportunities as well, providing a multi-pronged approach that would support the community in multiple ways.

Cortes Island – Cortes Island School***Key Findings and Recommendations:*****1) Alternate Composting Solution**

Recognizing there will be limited information gather from the two Pilots on Cortes Island, largely attributed to COVID restrictions, CSWM staff extended an invitation to the senior class at the Cortes Island school to test the Bokashi fermentation process and to:

- gather additional information on how the Pilot may be expand to schools; and
- provide a learning opportunity for the students.

The Bokashi system, relatively inexpensive and able to compost waste under a kitchen sink, requires the fermented organic material to be placed into the ground after two weeks of fermentation, for a further two week curing period. The fermentation process allows for a nutrient rich soil amendment that can be buried directly back into the garden. This additional curing time was not preferred by the school who opted to proceed with their existing cold composting program. Cold composting produces a coarser final product in four to six months and only requires material to be layered in a bunker.

A local resident offered to take the Bokashi system home to test it and had great success. The Bokashi works efficiently in little time and can be placed directly under a kitchen sink or in a pantry. Although it was noted there were some odors when opening the bucket to add food waste and draining the compost tea, the system worked effectively at composting all residential food scraps including meat and cut up bones. The Bokashi system may be a useful method for at home composting and utilizing five gallon buckets can be a more affordable option compared to purchasing the \$75-100 Bokashi kit. In addition, residents do not have to purchase the bran mixture to utilize fermentation composting, they can utilize residual waste from beer making processes or make their own with molasses, coffee husks, sawdust, spent grain and water. This is also an effective method for composting on larger scales and may be a good solution for our smaller communities.

Village of Zeballos

Key Findings and Recommendations:

1) Composting Opportunities

Although Village of Zeballos (Zeballos) was not part of the Pilot, the CSWM service found two composting opportunities within the Village of Zeballos:

- a Joracan composter located adjacent to the recycling depot at the community garden, currently not in use; and
- a worm bin located at the local school by the students.

The Joracan composter was historically purchased by the local garden society and has been utilized by various community groups and residents throughout the years. The Joracan's use in Zeballos has occurred off and on over time. This is another example which highlights the importance of dedicated staff to operate a compost program. Without this commitment, the compost program may eventually cease to operate.

2) Participation considerations

Due to the very low population in Zeballos and given the data indicated low participation uptake in composting programs, it's recommended that any residents in Zeballos interested in composting utilize the existing opportunities. In consideration of the 3-17 percent participation level of the pilot, a composting program in the Village would potentially only benefit three to eighteen individuals (versus households). These are considerations that need to be factored in when working with jurisdictions and municipalities on programs that require public works involvement.

3) Vector Issues

Although bears have accessed the food growing in the community garden, they have never been successful in opening the composter and have not caused any damage to the unit.