



Request for Information
Processing Municipal Organic Feedstocks into Value-Added End Products

Request for Information No.: **2018-RFI-WTE**

Issued: **February 23rd 2018**

Submission Time: **March 23rd 2018**

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1. Introduction

This Request for Information (“RFI”) is issued by the Town of Banff (“the Town”) for the purposes of gathering information about the marketplace in order to assist in the determination of future purchasing options or requirements. Respondents are asked to respond to the Town and provide the information requested below.

2. RFI Timetable

Issue Date of RFI	February 23 rd 2018
Site Visit	As requested
Time for Questions	March 23 rd 2018 4:00 PM MST
Time for Addenda	March 19 th 2018 4:00 PM MST
Submission Time	March 23 rd 2018 4:00 PM MST

The RFI timetable is tentative. It may be changed by the Town at any time, and the Town may choose to waive or extend the Deadline for Questions, Deadline for Addenda and/or the Submission Deadline.

3. Background

The purpose of this Request for Information is for the Town of Banff to discover potential processes or technologies that could support the Town to achieve its goals of transforming municipal organic feedstocks into valuable end products, while minimizing greenhouse gas emissions, and maximizing overall environmental benefits.

The Town’s main objective through this Request for Information is to explore further options for processing municipal source-separated organics (food scraps). However, the Town is open to proposed approaches that also use other organic feedstocks such as biosolids, leaf and yard waste and/or other materials as inputs. Appendix B details various potential organic feedstock scenarios.

As stated in the Town of Banff Community Plan, the Town of Banff strives to be an environmental role model for communities around the world. Currently, the Town is exploring pathways that could lead the Town, as an entire community, to source 100% of its energy from renewable sources by 2050. Although the Town has not yet committed to this goal, Town administration is actively researching key strategies and technologies that could support the Town to achieve this goal.

Although the Town of Banff has made significant progress in diverting and recycling organic materials from the MSW stream, there remain many opportunities to further divert and recycle municipal organic materials, including both food scraps and leaf and yard waste, as outlined in detail in Appendix B. Biosolids generated at the Town of Banff wastewater treatment plant are currently processed into an agricultural soil amendment at the N-Viro Facility located at the wastewater treatment plant site. In a regional context, there is growing interest in further diversion and recycling of municipal-generated organic materials, and in particular food scraps, throughout the Bow Valley.

The Town of Banff is interested in more deeply examining the environmental costs and benefits of its current approaches to manage organic materials generated in the municipality, including biosolids, food waste and leaf and yard waste. The town is looking for leading edge and proven technologies to deliver a sustainable solution. The Town is aware that the wastewater treatment plant currently has the highest electricity consumption and one of the highest levels of natural gas consumption for the entire community. The Town is also aware that food scraps currently generated within the Town are transported a significant distance to be processed at a turned windrow compost facility.

The Town emphasizes that it uses the zero waste hierarchy to guide its decision-making regarding integrated waste management (Figure 1).



Figure 1. Zero waste hierarchy for the highest and best use of materials. Recycling / composting can include anaerobic digestion.

4. Information Requested

The following details shall be included within a submitted Request for Information, in order for thorough review:

Expression of Interest – Checklist
Introduction to firm(s)

	Name, contact information and profile for the firm(s) submitting the expression of interest. If multiple partners are submitting the expression of interest together, describe the role of each project partner.
Description of previous related experience and successful projects.	
	Description of previous experience in the field of processing municipal organics for beneficial reuse and/or renewable energy generation, including the size and scale of previous projects. Describe how the size and scale of previous projects is relevant to the proposed size and scale of the project proposed in Banff.
	Specifically, describe and discuss previous experience managing and processing source-separated organics, including food scraps.
	Describe the history of any specific process or technology being proposed, including examples of other applications with similar feedstocks and at a comparable scale.
	List contact information for at least three references for previous projects completed.
Process and technology description	
	Description of the proposed process(es) and technologies that would be used to process municipal organics into valuable end products and/or renewable energy
	Diagram and/or flow chart of all process stages
	Footprint of the proposed process and/or technologies in square metres
	Proposed location(s) for the process
	Municipal feedstocks to be processed – type and quantity.
	Describe and quantify any other feedstock(s) and/or input materials needed for the process and where these materials would be sourced from.

	Quantify the energy use and/or output(s) per tonne of processed feedstock for each process stage, and the type of energy required (ie electricity, natural gas, diesel fuel, etc.)
	Quantify the labour required for each process stage.
	Quantify and describe the characteristics of each and all products produced in the proposed process.
	Describe the end destination for each product, including the distance to the final destination, and a description of how the product will be transported to this destination.
	Describe how any end products will be marketed, if applicable. Who will be responsible for the marketing of the final product(s)?
	Anticipated lifespan of each physical component of the proposed approach.
Environmental specifications	
	Describe the environmental compliance specifications / standards that the proposed process, technology and/or equipment meets.
	Describe how the proposed process meets the requirement that source-separated organics are maintained in closed containers / areas that cannot be accessed by wildlife.
	Quantify and characterize any air emissions generated through the proposed process, on a per tonne processed basis.
	Quantify and describe any waste products generated through the proposed process, and describe the end destination for these waste products, on a per tonne processed basis.
Risk analysis	

	Given the local context in Banff, what do you anticipate are the main risk factors that could impede the successful construction and/or operation of the organics processing approach you propose?
Scalability and flexibility	
	Discuss the scalability and flexibility of the proposed process, in the context of the range of potential municipal feedstocks available, which are found in Section 6 Appendix B
Cost estimates	
	Provide a Class D (-20%,+30%) cost estimate of projected capital costs to construct the organics processing system proposed. Ensure this capital cost provides detail on the following elements: equipment purchases, tie-in to existing infrastructure, if applicable, material handling equipment, etc.).
	Provide a Class D cost estimate of projected annual operating costs, on a cost/tonne of feedstocks processed basis. Describe the various elements of the operating cost (labour, fuel/electricity, equipment maintenance, etc.)
	Discuss how the operating cost/tonne processed would vary, in the context of the range of potential organic feedstock inputs (potential economies of scale).

5. Ranking Criteria

Town of Banff may use following ranking criteria:

1. Logistical feasibility of the proposed organics processing approach within the Banff context
2. Environmental benefits and costs of the proposed organics processing approach, with a particular focus on greenhouse gas emissions
3. Previous experience of the firm(s) in using the proposed organics processing approach to manage municipal organics, including source separated organics, at a comparable scale
4. Risk analysis of the proposed organics processing approach
5. Cost
6. Scalability and flexibility of the proposed organics processing approach

6. Submission Instructions

Respondents are asked to submit their information and signed Respondent Submission Form by Friday, March 23rd 2018 to the following address and to the attention of the following RFI Contact:

Rakesh Savani P.Eng., PMP
Project Manager, Town of Banff
120 Hawk Ave., Banff,
Canada.
Email:- Rakesh.savani@banff.ca

Respondents should direct any questions on this RFI process to the same RFI Contact.

Submissions should include a completed and signed Respondent Submission Form (Appendix A) that acknowledges, among other things, that this RFI and any respondent submissions will not create a legal relationship or obligation regarding the procurement of any good or service.

APPENDIX A – RESPONDENT SUBMISSION FORM

1. Respondent Information

Please fill out the following form, naming one person to be the respondent's contact for the RFI process and for any clarifications or communication that might be necessary.	
Full Legal Name of Respondent:	
Any Other Relevant Name under which Respondent Carries on Business:	
Street Address:	
City, Province/State:	
Postal Code:	
Phone Number:	
Fax Number:	
Company Website (if any):	
Respondent Contact Name and Title:	
Respondent Contact Phone:	
Respondent Contact Fax:	
Respondent Contact Email:	

2. Terms of Reference

In responding to this RFI, the respondent acknowledges its acceptance of the following RFI Terms of Reference:

a. Request for Information Not a Formal Competitive Bidding Process

This RFI is issued for information-gathering purposes and is not intended to be a formal legally binding "Contract A" bidding process. Without limiting the generality of the foregoing, this RFI will not necessarily result in any subsequent negotiations, direct contract award, invitational tendering process or open tendering process, and does not constitute a commitment by the Town to procure any goods or services.

b. RFI Not to Limit the Town's Pre-existing Rights

This RFI will not limit any of the Town's pre-existing rights. Without limiting the generality of the foregoing, the Town expressly reserves the right, at its discretion, to:

- (i) seek subsequent information or initiate discussions with any potential supplier, including potential suppliers that did not respond to this RFI;

- (ii) initiate direct negotiations for the procurement of any good or service with any potential supplier or suppliers, regardless of whether the potential supplier or suppliers responded to this RFI;
- (iii) contact a limited number of potential suppliers, which may include only those that responded to this RFI or may include potential suppliers that did not respond to this RFI, for the purpose of a competitive process for the procurement of any good or service;
- (iv) elect to proceed by way of open tender call where all potential respondents, including those that did not respond to this RFI, are eligible to compete for the award of a contract for the supply of any good or service; and
- (v) elect not to procure the good or service that is the subject of this RFI.

These expressly reserved rights are in addition to any and all other rights of the Town that existed prior to the issuance of this RFI.

c. Pricing Information for General Information Purposes Only

Any pricing information provided by respondents is for general information purposes and is not intended to be binding on respondents. Any legally binding pricing or purchasing commitments will be established only where specified by the express terms of a subsequent tender call process or where established through the execution of a written agreement.

d. Information in RFI Only an Estimate

The Town and its advisers make no representation, warranty or guarantee as to the accuracy of the information contained in the RFI or issued by way of addenda. Any quantities shown or data contained in this RFI, or provided by way of addenda, are estimates provided only as general background information.

e. Parties to Bear Their Own Costs

The Town will not be liable for any expenses incurred by a respondent, including the expenses associated with the cost of preparing responses to this RFI. The parties will bear their own costs associated with or incurred through this RFI process, including any costs arising out of, or incurred in, (i) the preparation and issuance of this RFI; (ii) the preparation and making of a submission; or (iii) any other activities related to this RFI process.

f. Accuracy of Responses

The respondent acknowledges that the information provided is, to the best of its knowledge, complete and accurate.

g. Submissions Will Not Be Returned

Except where set out to the contrary in this RFI or expressly requested in the respondent's submission, the submission and any accompanying documentation provided by a respondent will not be returned.

h. Confidential Information of the Town

All information provided by or obtained from the Town in any form in connection with this RFI either before or after the issuance of this RFI (i) is the sole property of the Town and must be treated as confidential; (ii) is not to be used for any purpose other than replying to this RFI; (iii) must not be disclosed without prior written authorization from the Town; and (iv) must be returned by the respondent to the Town immediately upon the request of the Town.

The respondent may not at any time directly or indirectly communicate with the media in relation to this RFI without first obtaining the written permission of the Town.

i. Disclosure of Information

The respondent consents to the Town's collection of information as contemplated under the RFI for the uses contemplated under the RFI. Respondents should not include information in their response that is proprietary or confidential. Information provided by a respondent may be released in accordance with governing laws. To the extent that a respondent does include confidential or proprietary information, the respondent should identify any information in its submission or any accompanying documentation supplied in confidence for which confidentiality is to be maintained by the Town. The confidentiality of such information will be maintained by the Town, except where an order by a tribunal or court requires the Town to do otherwise. The respondent consents to the disclosure, on a confidential basis, of this submission by the Town to advisers retained by the Town for the purpose of reviewing this submission.

The respondent acknowledges that the Town may make public the name of any and all respondents.

j. Governing Law

This RFI process will be governed by and construed in accordance with the laws of the province of Alberta and the federal laws of Canada applicable therein.

Signature of Witness

Signature of Respondent Representative

Name of Witness

Name of Respondent Representative

Title of Respondent Representative

Date



Town of Banff

Appendix B

Municipal Waste Information

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1. Background

1.1 Town of Banff

The Town of Banff is an incorporated municipality located within Canada's first National Park, Banff National Park, a UNESCO World Heritage Site. The Town of Banff is committed to delivering high quality services to its population of approximately 9,600, and the over 4 million people who visit each year, while minimizing its impact on the environment.

As stated in the incorporation agreement of 1989 which established the Town of Banff as a municipality within Banff National Park, the primary function of Banff is to serve as a centre for visitors to Banff National Park and to provide visitors with accommodation, interpretive services and other goods and services. In order to be eligible to reside within the Town of Banff, residents must be working within the town.

The Banff Community Plan states that Banff will strive to be an environmental role model for communities around the world, minimize energy and water consumption across the community, and reduce Banff's ecological footprint. The Banff Community Plan also states that the Town will divert recovered resources from the waste stream, and increase residential and commercial recycling. Environmental protection is a key focus area of Town policy-making, intended to protect and preserve resources by maintaining and enhancing ecological integrity.

The Town of Banff is an active member of the recently-formed regional Roundtable on Human Wildlife Coexistence, which was created as a result of significant concern in the Bow Valley that growth, development and activities in the Bow Valley were leading to more frequent encounters between humans and wildlife. Any new waste management approaches in the Town of Banff will need to be designed in a manner that minimizes the potential for human wildlife interactions. Currently, the Town is exploring pathways that could lead the Town, as an entire community, to source 100% of its energy from renewable sources by 2050. Although the Town has not yet committed to this goal, Town administration is actively researching key strategies and technologies that could support the Town to achieve this goal.

1.2 Legislative Context

The Town of Banff is an incorporated municipality within Banff National Park. National parks are under the jurisdiction of the Government of Canada, so in the Town of Banff there is a unique overlap of responsibility and authority among the local municipal government, the Alberta provincial government and the federal government. The federal government has final authority over Banff's land use planning, development and environmental regulations.

Any new projects or initiatives within the Town of Banff that could have an impact on the environment are required to go through an environmental assessment under the Canadian Environmental Assessment Act. Routine projects conducted within the Town go through a Model Class Screening Report process.

1.3 Geographical Context of Current WWTP, MSW and Recycling Operations

Wastewater from the Town of Banff is processed at the wastewater treatment plant (WWTP), located towards the end of the golf course road, as depicted in the map in Appendix D. Biosolids from the wastewater treatment plant go to the N-Viro processing facility, located at the wastewater treatment plant site. Municipal solid waste (MSW) and recycling streams from the Town of Banff are handled at a transfer site, located within the Town of Banff operations yard, also depicted in the map in Appendix D.

The golf course road that leads to the WWTP is subject to a seasonal usage restriction. Between November 1 and May 1, the golf course road is closed to the public, and is subject to restricted seasonal usage by the Town of Banff for WWTP operations. The purpose of this restriction is to reduce the level of human activity in an important wildlife corridor.

There are possibilities for further municipal organics processing infrastructure to be located at the site of the WWTP and/or at or near the operations yard.

2. Overview of Current Municipal Solid Waste Management

The Town of Banff recently completed a review of its waste generation, disposal and diversion data. Details from this waste characterization work as it was presented to Town Council are found in Appendix C.

The Town of Banff carries out collection of all MSW within the Town boundaries, from both the residential and non-residential sectors. Municipal solid waste is collected by Town staff, and hauled to the waste transfer site located at the operations yard. At the waste transfer site, the MSW is transferred into transport trucks, and hauled by Town staff to the West Dried Meat Lake Landfill, located approximately 370 km northeast of Banff, near Camrose, Alberta.

In the residential sector, residents deposit MSW in neighbourhood bear-proof collection bins found throughout town. Residents deposit recyclable materials in bear-proof neighbourhood recycling collection bins found adjacent to approximately one quarter of MSW collection bins. Residents separate recyclable materials into the following streams: mixed paper (including cardboard), metal and plastic containers, and glass. Residents are able to deposit food scraps in one of five bear-proof food scraps collection bins found throughout town. The Town is currently exploring opportunities to install food scraps collection bins in more residential locations throughout the community to make residential organics recycling more convenient.

In the non-residential sector, the Town offers separate collection of MSW, cardboard and food waste. There are 110 customers that have a MSW collection bin, 78 customers that have a cardboard collection bin and 33 customers that have a food waste collection bin. Non-residential customers self-haul other recyclable materials such as mixed paper, plastic and metal containers, and glass to the Town waste transfer site located in the operations yard.

Food waste from the residential and non-residential sectors is collected on a regular schedule from bear-proof bins and enclosures and hauled by Town staff to a collection site within the N-Viro facility at the WWTP. Weekly, the food waste is transferred to transport trucks and hauled to a turned windrow compost facility located approximately 200 km east of Banff near Strathmore, Alberta.

Leaf and yard waste is currently collected from the residential and non-residential sectors at a designated receiving bin at the transfer site at the Town operations yard. For residential customers, the Town also offers a leaf and yard waste collection service directly from individual properties. Leaf and yard waste is transferred to a transport truck and hauled to the Francis Cooke Class III Facility, located 45 km east of Banff. At the Francis Cooke Facility, the leaf and yard waste is composted in turned windrows.

3. Overview of Wastewater Treatment Plant (WWTP)

The WWTP uses state-of-the-art biological nutrient removal technology to remove total nitrogen and total phosphorus from the wastewater through the use of microorganisms under different environmental conditions throughout the treatment process. Given that it is located within a national park, the Town of Banff is held to a higher standard of operation than other municipalities, and regularly exceeds Parks Canada leadership goals with respect to wastewater treatment (Table 1).

Table 1. Wastewater treatment plant environmental stewardship leadership targets in the Mountain National Parks

Parameter	Alberta Environments Requirement	Leadership Targets
Total Phosphorus (mg/L)	1	0.15
Fecal Coliforms (No /1000mL)	200 (Geometric mean)	2
Total Coliform (No/100ml)	1000 (geometric mean)	--
Solids, total suspended (mg/L)	20	5
5-Day BOD (mg/L)	20	10 (summer) 20 (winter)
Ammonia (NH ₃ -N) (mg/L)	5 (summer) 10 (winter)	1 (summer) 5 (winter)
Toxicity, 96 hour LC-50, percent passing	100	100

Figure 1 shows a process diagram for the WWTP. Phases at the WWTP include the following: screening, grit removal, primary clarifiers, bioreactor, secondary clarifiers, filtration and disinfection. Sludge from the WWTP goes through the following process phases: complete mix, fermentation, dissolved aeration filtration, centrifuge and N-Viro (explained more fully below).

Banff WWTP-Generalized Process Schematic

July 28 2009

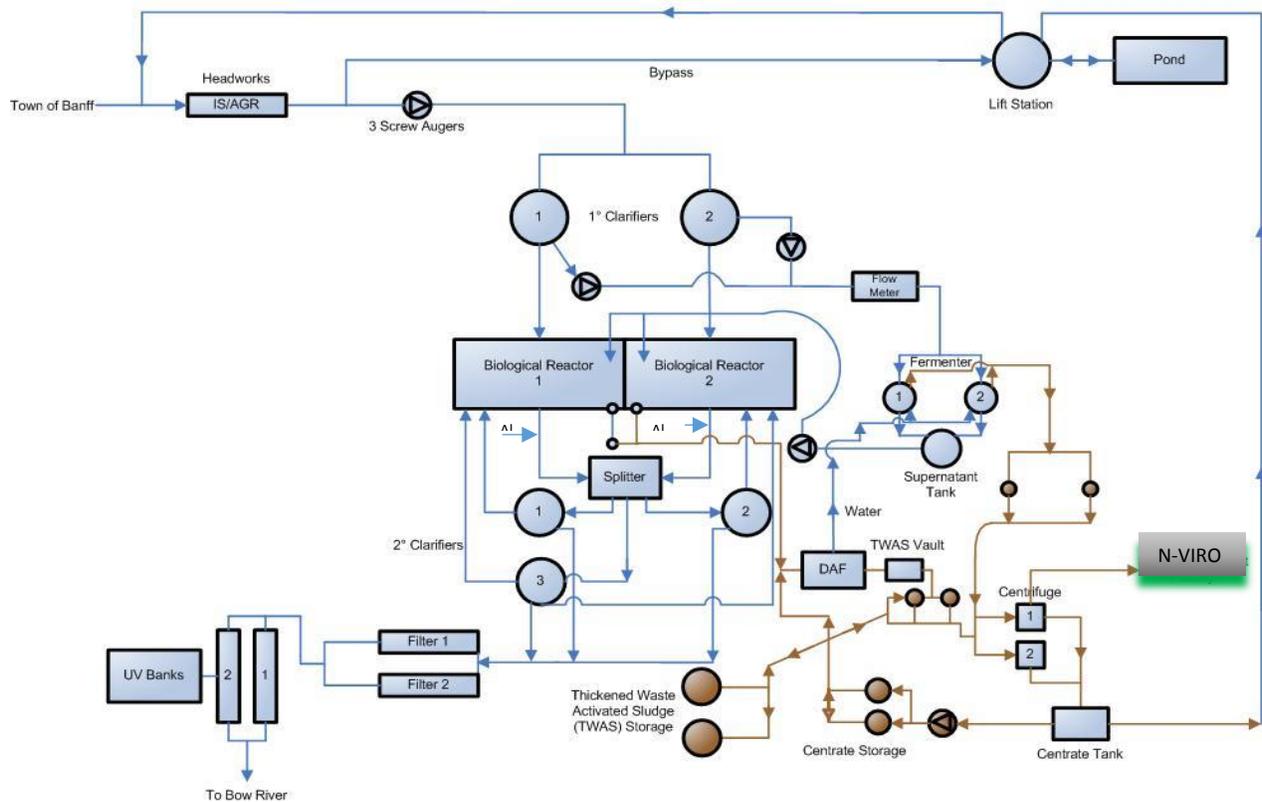


Figure 1. General process schematic for the Banff Wastewater Treatment Plant. Table 2 summarizes the annual quantity of sludge and biosolids produced at the WWTP over the past four years.

Table 2. Sludge and biosolids production at the Banff WWTP from 2014 to 2017

Year	Total Annual Volume of Sludge (TWAS +TFS) (m ³)	Annual Average % Solids	Annual Quantity of Biosolids (tonnes)
2014	13,920	18.39	2,545
2015	15,278	20.8	2,901
2016	14,855	20.77	3,160
2017	13,587	20.6	2,802

Notes: TWAS – Thickened waste activated sludge; TFS – total fixed solids.

The WWTP is one of the Town’s largest consumers of electricity and natural gas. Table 3 outlines electricity consumption at the WWTP by month from 2014 to 2016. Table 4 outlines natural gas consumption at the WWTP by month from 2013 to 2016.

Table 3. Electricity consumption at the Banff WWTP from 2014 to 2016.

Wastewater Treatment Plant				
Electricity Consumption - Time Adjusted Data (kWh)				
Month	2014 (kWh)	2015 (kWh)	2016 (kWh)	2014-2016 Average (kWh)
January	282,359	233,547	275,530	263,812
February	241,071	210,244	242,457	231,257
March	248,678	213,226	286,687	249,530
April	219,410	204,563	228,120	217,364
May	210,249	203,336	210,080	207,888
June	192,495	174,865	213,327	193,562
July	180,628	178,690	208,872	189,397
August	184,246	185,782	191,180	187,069
September	182,367	181,867	205,373	189,869
October	178,069	214,748	262,812	218,543
November	187,783	215,466	245,519	216,256
December	218,640	277,290	274,125	256,685
Totals	2,525,996	2,493,623	2,844,082	2,621,234

Table 4. Natural gas consumption at the Banff WWTP from 2013 to 2016.

Wastewater Treatment Plant					
Time Adjusted Data (GJ)					
Month	2013 (GJ)	2014 (GJ)	2015 (GJ)	2016 (GJ)	2013-2016 Average (GJ)
January	1,324	907	1,019	842	1,023
February	963	1,060	958	699	920
March	1,051	820	781	665	829
April	870	452	613	455	598
May	614	311	96	378	350
June	48	163	57	232	125
July	50	78	47	163	85
August	50	94	29	139	78
September	60	224	89	291	166
October	527	356	358	652	473
November	1,005	892	684	664	811
December	1,057	992	843	1,465	1,089
Totals	7,618	6,350	5,574	6,643	6,546

4 Overview of N-Viro Biosolids Treatment

Since 2013, biosolids from the WWTP have been sent to the Banff N-Viro Processing Facility, located on the grounds of the WWTP. The Town of Banff contracts Walker Environmental Group Inc. to operate and maintain the N-Viro Processing Facility. At this facility, biosolids are combined with alkaline admixtures composed of cement kiln dust and/or lime kiln dust, to raise the temperature and pH of the material to achieve pathogen kill. The final product, Banff N-Rich®, is a high pH fertilizer, certified by the Canadian Food Inspection Agency. Sales of this fertilizer product are managed by Walker Environmental. The fertilizer product is sold to agricultural producers in the region east of Calgary and Red Deer.

The Town of Banff has been approved by Parks Canada to receive dewatered biosolids from the Town of Canmore for processing at the N-Viro Processing Facility. Treatment of Canmore biosolids at the Banff N-Viro Processing Facility has not occurred to date, as the Town of Canmore is currently undertaking work to further dewater their biosolids to a moisture content that is acceptable for the N-Viro process.

5 History of Previous Composting Operations

Since the 1990s, the Town of Banff has been composting biosolids produced at the wastewater treatment plant. Initially, biosolids were composted in turned windrows. Later, the biosolids were composted in in-vessel aerated channels located at a compost facility at the WWTP, and then cured at an old landfill site located near Castle Junction in Banff National Park. In 2007, the

Town of Banff began adding source-separated organics to its biosolids composting program, as the Town started a food scraps diversion program.

One of the biggest challenges the Town experienced in managing its composting operation was finding adequate end markets for the Category A compost it produced. Ultimately, this was the biggest driver which led to the change to the N-Viro process to convert biosolids into a valuable end product, which began in 2013.

6. Description of Available Feedstock Materials

This section describes four scenarios of organic feedstock materials. Scenario A describes the current feedstocks available in the Town of Banff. These feedstocks are directly managed by the Town of Banff. The Town of Banff is initiating work to increase diversion of source-separated organics and recyclable materials from the waste stream. Scenarios B and C describe the additional organic feedstocks that could be available from the Town of Banff, according to various levels of increased organics diversion.

Scenario D describes some potential organic material streams that may be available over time, regionally. In order for the organic material streams described in Scenario D to become available for processing, these materials would need to be diverted from the waste stream in the respective communities, and agreements would need to be established with the jurisdictions from where these organic material streams would be sourced.

6.1 Scenario A – Town of Banff Current Situation

Scenario A describes the current feedstocks available in the Town of Banff. These feedstocks are directly managed by the Town of Banff. The Town of Banff recently completed a review of its waste generation and diversion, including a waste characterization study. The overall results of this work are found in Appendix C.

In 2016 and 2017, of all municipal solid waste resources generated within the Town of Banff, and handled by Town of Banff staff, 46% were diverted for recycling, and 54% were sent for disposal in a landfill (Table 5). Table 6 summarizes the average annual quantity of organic materials that are currently collected for recycling, while Table 7 summarizes the average annual quantity of other materials collected for recycling within the Town of Banff.

Data have been averaged for the years 2016 and 2017, as overall waste generation, diversion and material stream recycling rates were very similar for these two years, and this is the time period since detailed annual diversion records have been kept at the transfer site scale. These figures do not include construction, renovation and demolition (CRD) waste which was transported directly from Banff construction projects to the landfill at the Francis Cooke Facility.

Table 5. Average annual quantity of municipal solid waste sent for disposal and diversion.

Material	Current Average Annual Quantity (tonnes/year)
Municipal Solid Waste (MSW) – disposed (54%)	4,925
Municipal Solid Waste (MSW) – diverted (46%)	4,135

Note: These figures are based on Banff transfer site scale data from 2016 and 2017.

Table 6. Current average annual quantity of organic materials collected for recycling.

Organic Material Streams	Current Average Annual Quantity (tonnes/year)
Food and Food-soiled Paper	2,143
Leaf and Yard Waste	207
Scrub and Brush	72
Biosolids	2,981

Note: These figures are based on transfer site scale data from 2016 and 2017.

Table 7. Current average annual quantity of other materials collected for recycling.

Other Recycling Streams	Current Average Annual Quantity (tonnes/year)
Cardboard	775
Kiln Dried Wood	264
Mixed Paper	240
Mixed Plastic & Metal Containers	113
Metal	94
Concrete	69
Glass	52
Mattresses / Boxsprings	35
Electronics	19
Drywall	16
Tires	16
Asphalt	10
All Other Materials	10.4

Note: These figures are based on transfer site scale data from 2016 and 2017.

According to the municipal census conducted on June 12, 2017, the Town of Banff had a permanent population of 8,865 and a shadow population of 793, for a total population count of 9,658. Because the shadow population is less than 10% of the permanent population, and less than 1,000 persons, it is not recognized by the provincial government, and therefore Banff's official population is listed as 8,865. With the inclusion of the shadow population, the annual population growth rate between 2014 and 2017 was 1.0%. The Town of Banff receives more than 4 million visitors each year.

From a waste management perspective, in the non-residential sector, there are 110 locations that have a waste bin, 78 locations that have a cardboard recycling bin, and 33 locations that have a food waste recycling bin. This includes some locations where multiple businesses use one or multiple bins collectively.

6.2 Scenario B – Town of Banff Diverts 50% of Organic Materials Currently in the Waste Stream

The Town of Banff is initiating work to increase diversion of source-separated organics and recyclable materials from the waste stream. Scenario B (Table 8) describes the quantity of organic material streams that would be available from the Town of Banff, if 50% of organic materials that are currently in the waste stream were diverted for recycling.

Table 8. Scenario B – Town of Banff diverts 50% of organic materials currently in the waste stream.

Organic Material Streams	Projected Annual Quantity Available (tonnes/year)
Food and Food-Soiled Paper	3,187
Leaf and Yard Waste + Scrub and Brush	471

Assumptions and notes:

- No projected overall increase in waste generation.
- Increased organics diversion is through use of organic waste collection bins.
- Leaf, yard, scrub and brush materials are included together, due to the category methodology used in the waste composition study.

6.3 Scenario C - Town of Banff Diverts 70% of Organic Materials Currently in the Waste Stream

Scenario C (Table 9) describes the quantity of organic material streams that would be available from the Town of Banff, if 70% of organic materials that are currently in the waste stream were diverted for recycling.

Table 9. Scenario C – Town of Banff diverts 70% of organic materials currently in the waste stream.

Organic Material Streams	Projected Annual Quantity Available (tonnes/year)
food and food-soiled paper	3,605
leaf and yard waste + scrub and brush	548

Assumptions and notes:

- No projected overall increase in waste generation.
- Increased organics diversion is through use of organic waste collection bins.
- Leaf, yard, scrub and brush materials are included together, due to the category methodology used in the waste composition study.

6.4 Scenario D – Potential Regional Organic Material Streams

Scenario D describes some potential organic material streams that may be available over time, regionally (Table 10). In order for the organic material streams described in Scenario D to become available for processing, these materials would need to be diverted from the waste stream in the respective communities, and agreements would need to be established with the jurisdictions from where these organic material streams would be sourced. Scenario D represents current estimated quantities that are available, and has not taken projected population growth in Canmore into consideration. Additional regional organic material streams, in the form of construction, renovation and demolition materials, have not been factored into this scenario.

Table 10. Scenario D – Potential Regional Organic Material Streams

Organic Material Streams	Projected Average Annual Quantity Generated (tonnes/year)
Town of Canmore – biosolids ¹	3,380
Town of Canmore - residential food and food-soiled paper ²	1,652
Town of Canmore - non-residential food and food-soiled paper ³	3,069
Lake Louise - residential and non-residential food and food-soiled paper ⁴	453
Chateau Lake Louise - food and food-soiled paper ⁵	96

Notes and assumptions:

1. Source: Town of Canmore Public Works Department Annual Report 2016. This figure is an average of annual biosolids generation for 2015 and 2016.
2. Estimate, based on the following data and assumptions:
 - Data: 2017 Town of Canmore MSW (residential) – measured = 4,131 tonnes
 - Assumption: 40% of MSW is food and food-soiled paper
3. Estimate, based on the following data and assumptions:
 - Data: 2017 Town of Canmore MSW (residential) – measured = 4,131 tonnes
 - Assumption: Residential MSW = 35% of total waste stream; Non-residential MSW = 65% of total waste stream (Canadian averages).
 - Assumption: 40% of non-residential waste stream is food and food-soiled paper
4. Estimate, based on the following data and assumptions:
 - Data: 2017 Lake Louise MSW (combined residential and non-residential sectors)
 - Assumption: 40% of MSW is food and food-soiled paper
5. Estimate provided by staff at Chateau Lake Louise.

REQUEST FOR DECISION

Subject: Waste Characterization Study



Presented to: Council

Date: February 12, 2018

Submitted by: Shannon Ripley, Environmental
Coordinator Agenda #: 8.3

RECOMMENDATION

That Council direct administration to return in the 2nd quarter of 2018 with options for waste diversion targets, and tactics to increase diversion rates for food and food-soiled paper, yard and garden materials, and mixed paper.

BACKGROUND

Reason for Report

To brief Council on waste generation and diversion data for the Town of Banff, including results from a recent waste characterization study, and to seek direction on future waste diversion targets and potential tactics to achieve those goals.

On November, 14, 2016, a workshop was held with Council to present draft results from the waste characterization study completed by Hankins Environmental Consulting between fall 2015 and summer 2016.

In addition to achieving Community Plan and Council Strategic Plan objectives on waste diversion, diverting materials from landfill for recycling significantly reduces greenhouse gas emissions. Most of the unrecycled solid waste from Banff is transported more than 350km northeast to a landfill near Camrose. Environment Canada reports that the decomposition of organic materials in landfills generates 20% of Canada's methane emissions. Methane is a greenhouse gas 25 times more potent than carbon dioxide in terms of its global warming potential. In addition, it takes substantially less energy to make a new product from recycled inputs, instead of primary inputs.

Summary of Issue

Tracking the amount of waste resources generated, recycled and sent to landfill each year enables the Town to evaluate current waste diversion policies and programs, and to identify further resource recovery opportunities. Reporting is most often done by weight rather than volume.

Diversion and Disposal Rates

Figure 1 shows that in 2016 and 2017, of all municipal solid waste resources generated within the Town of Banff, and handled by Town of Banff staff, 46% were diverted for recycling, and 54% were sent for disposal in a landfill. Data have been averaged for the years 2016 and 2017, as overall waste generation and diversion rates were very similar for these two years, and this is the time period since detailed annual diversion records have been kept at the transfer station scale.

These figures do not include construction, renovation and demolition (CRD) waste which was transported directly from Banff construction projects to the landfill at the Francis Cooke Facility, or biosolids, which are outputs from the wastewater treatment process which are recycled into an agricultural soil amendment at the N-Viro facility.

Data from the Alberta Municipal Benchmarking Initiative show that Banff's diversion rate has remained between approximately 39% and 46% since 2012. These diversion rates are higher than for other Alberta municipalities participating in the Benchmarking Initiative, which vary between 10%

and 38%. However, Alberta has the highest average per capita waste disposal rate in Canada (Statistics Canada 2017). Some communities leading waste diversion efforts in Canada include the Regional District of Nanaimo (68% diversion), City of Vancouver (63% diversion), City of Guelph (63% diversion) and Halifax Regional Municipality (61% diversion).

Waste Generation in the Non-Residential and Residential Sectors

Figure 2 shows the relative proportion that the non-residential and residential sectors contribute to the municipal solid waste stream sent to landfill. The non-residential sector generates 65% of the waste stream, while the residential sector generates 32% of the waste stream, and 3% of the waste stream is generated from pedestrian waste bins throughout the community. These proportions of non-residential and residential waste reflect very closely what is commonly found in communities across Canada as reported in Statistics Canada Waste Management Industry Surveys.

In 2015, the Town of Banff collaborated with the Town of Canmore to hire a contractor to measure what materials remained in the garbage bin waste streams sent to landfill in both Banff and Canmore. The purpose of completing this waste characterization study was to identify what materials should be prioritized through future waste diversion policies and programming efforts, to increase the Town of Banff's diversion rates. In Banff, waste samples were collected, categorized and weighed from the residential and non-residential sectors in fall 2015 and winter, spring and summer of 2016.

Average Diversion and Disposal of Waste Resources in the Town of Banff in 2016 and 2017

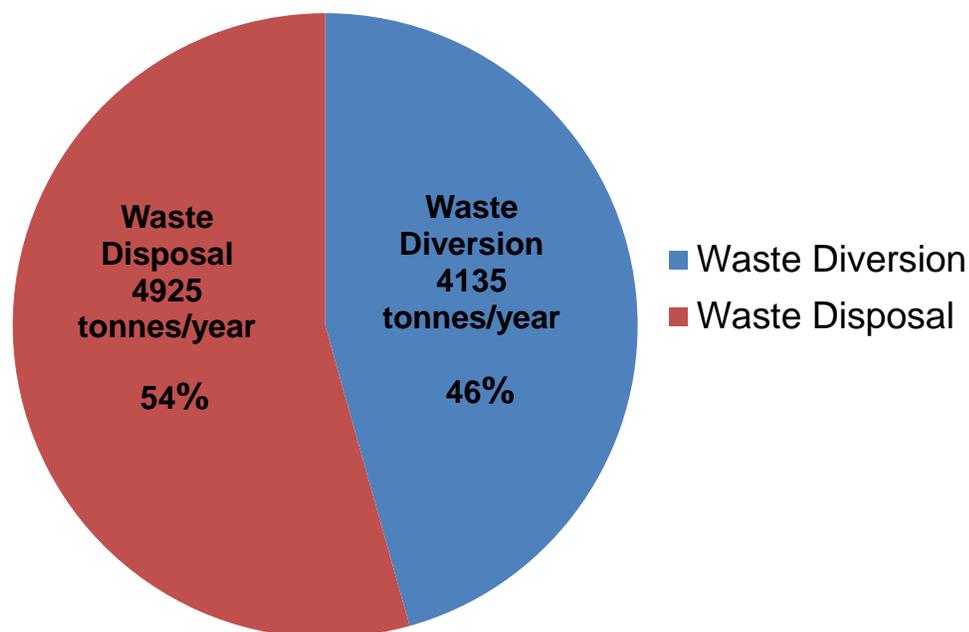


Figure 1. Average diversion and disposal of waste resources in the Town of Banff in 2016 and 2017.

Proportion of Residential, Non-Residential and Pedestrian Landfilled Waste in the Town of Banff in 2016 and 2017

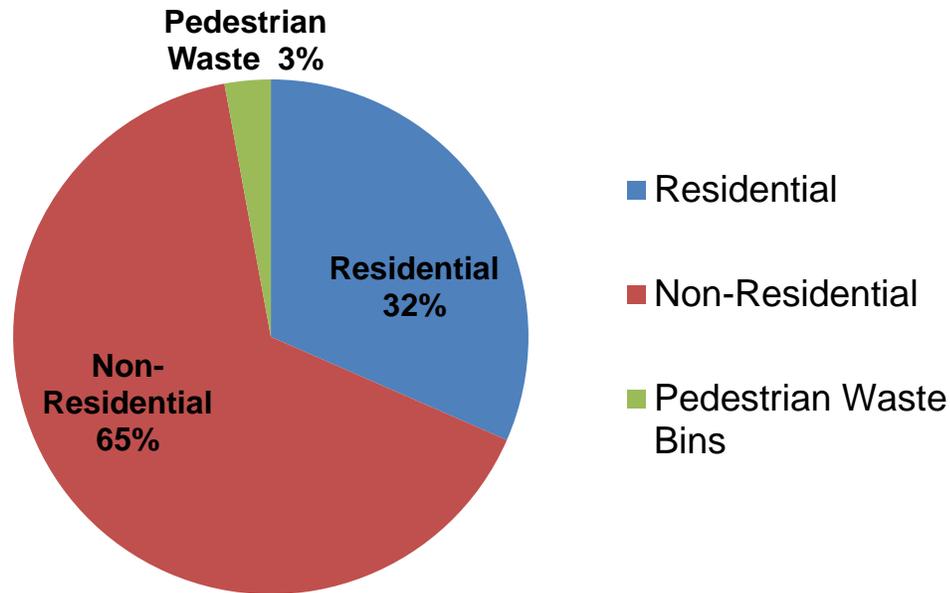


Figure 2. Proportion of landfilled residential, non-residential and pedestrian waste in the Town of Banff in 2016 and 2017.

Residential Sector Waste Characterization

For the residential sector, waste samples were collected in each season from the same sixteen residential neighbourhood waste bins. Figure 3 depicts the proportion of various materials found in the residential waste stream. Compostable organic materials made up 41.5% of the waste stream, with food and food-soiled paper at 35% and yard and garden materials averaging 6.5% of the waste stream. Mixed paper and cardboard comprised 12.5% of the waste stream. In total, 67% of the residential waste stream contained materials that are currently recyclable through Town of Banff programs and the bottle depot.

Non-Residential Sector Waste Characterization

In the waste characterization study for the non-residential sector, the same four waste bins were sampled in each season, representing the restaurant, hotel, retail and light industrial sectors. Figure 4 shows the proportion of various materials found in the sampled non-residential waste stream. Food and food-soiled paper made up almost half of the waste stream (48%), with yard and garden materials averaging an additional 8.8%. In total, 76% of the non-residential waste stream contained materials that are currently recyclable through Town of Banff programs and the bottle depot.

Composition of Town of Banff Residential Waste

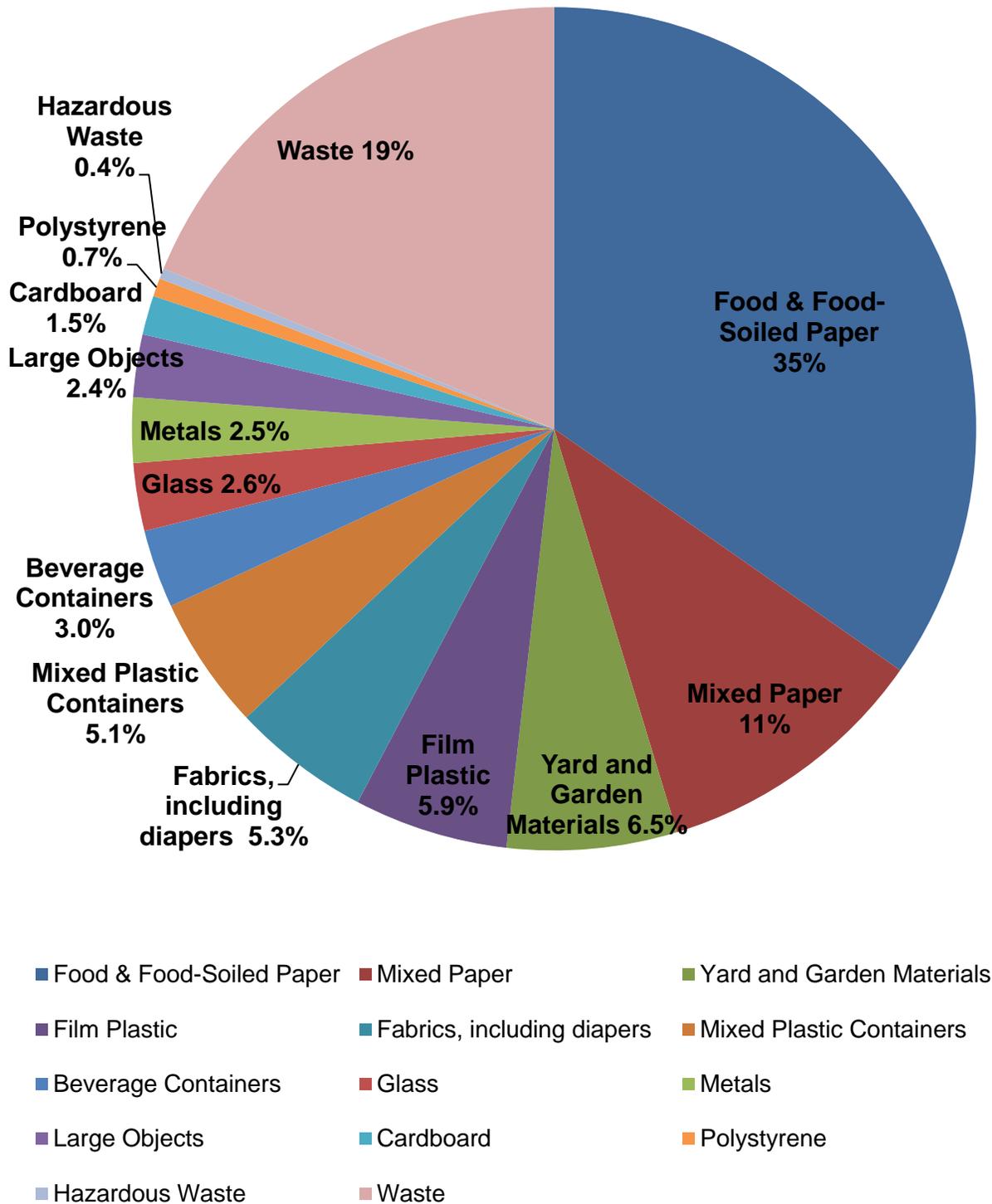


Figure 3. Composition of Town of Banff Residential Waste

Composition of Town of Banff Non-Residential Waste

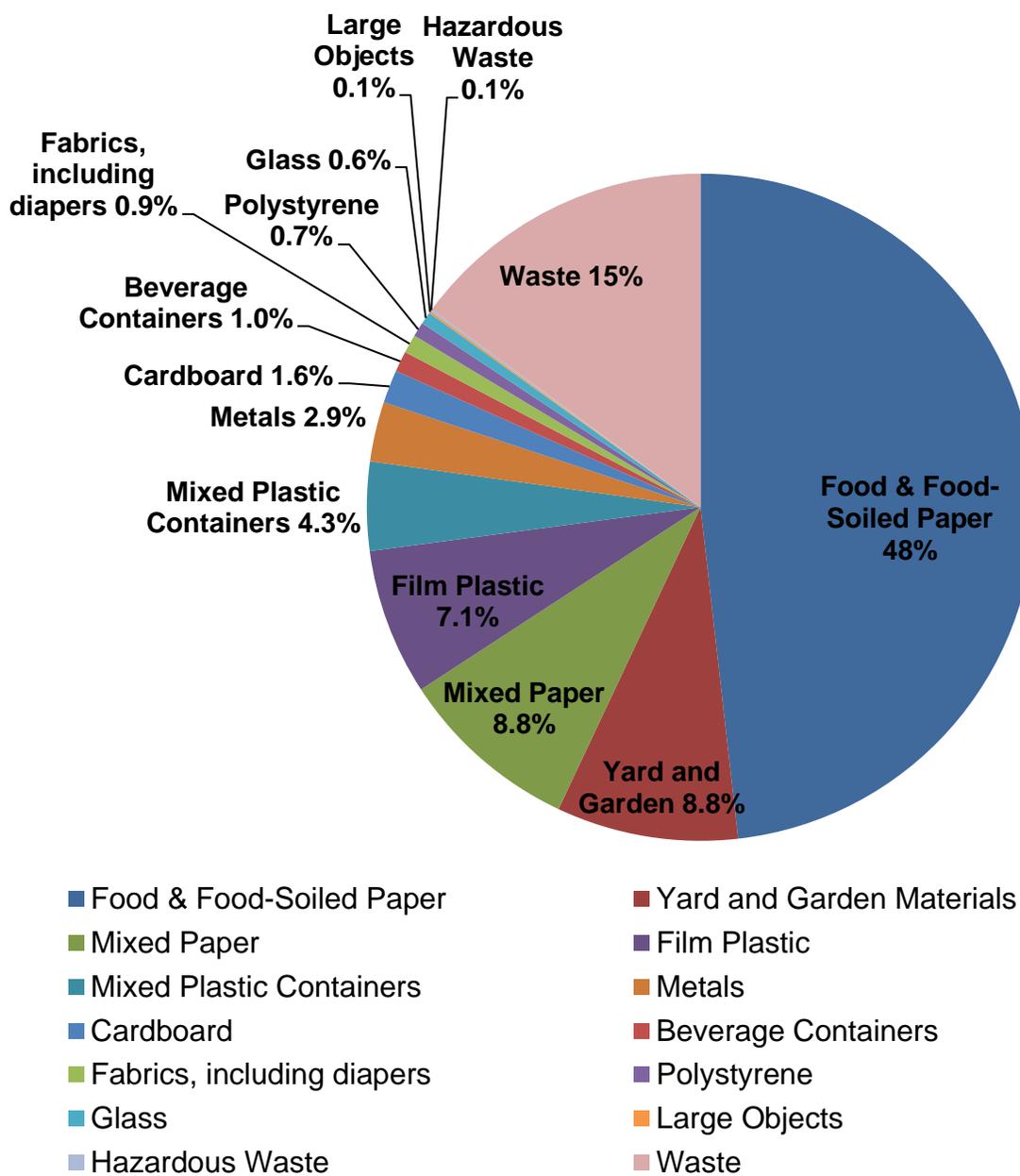


Figure 4. Composition of Town of Banff Non-Residential Waste

In the non-residential sector, there are 110 locations that have a waste bin, 78 locations that have a cardboard bin and 33 locations that have a food bin. The Town of Banff has set a price structure for garbage, cardboard and food bin pick-up that provides an economic incentive to encourage non-residential entities to recycle cardboard and food scraps. Currently, there is a 5% discount for cardboard bin pick-up, and a 40% discount for food scraps pick-up, relative to garbage. Results from the waste characterization study demonstrate that, despite the price differential, extensive opportunities for further recycling still exist.

As of November 1, 2017, the Town of Banff began requiring that the non-residential sector use clear bags to dispose of all waste materials, as a tool to foster waste diversion. This policy change will enable easier identification of recyclable and compostable materials in the waste stream, for both non-residential customers and Town of Banff staff.

Amount and Characterization of Diverted Materials

Of the 46% of waste resource materials diverted for recycling each year, there is a wide variety of materials sent for recycling (Figure 5). Food waste diversion comprises over half of the recycling stream, while cardboard and mixed paper comprise one quarter.

Opportunities for Increased Diversion

The top three opportunities for increased recycling of materials from the municipal solid waste stream within the Town of Banff for both the residential and non-residential sectors are:

- Food and food-soiled paper
- Yard and garden material
- Mixed paper

Although food waste and food-soiled paper already comprise over half of the recycling stream, they are also by far the biggest components of the waste stream for both the residential (35%) and non-residential (48%) sectors.

Another organics stream, yard and garden materials, also comprises a significant portion of the waste stream, at 6.5% in the residential sector and 8.8% in the non-residential sector.

Mixed paper is the third-largest material stream going to landfill, with 11% from the residential sector and 8.8% from the non-residential sector.

Average Annual Quantity of Materials Diverted for Recycling in the Town of Banff in 2016 and 2017

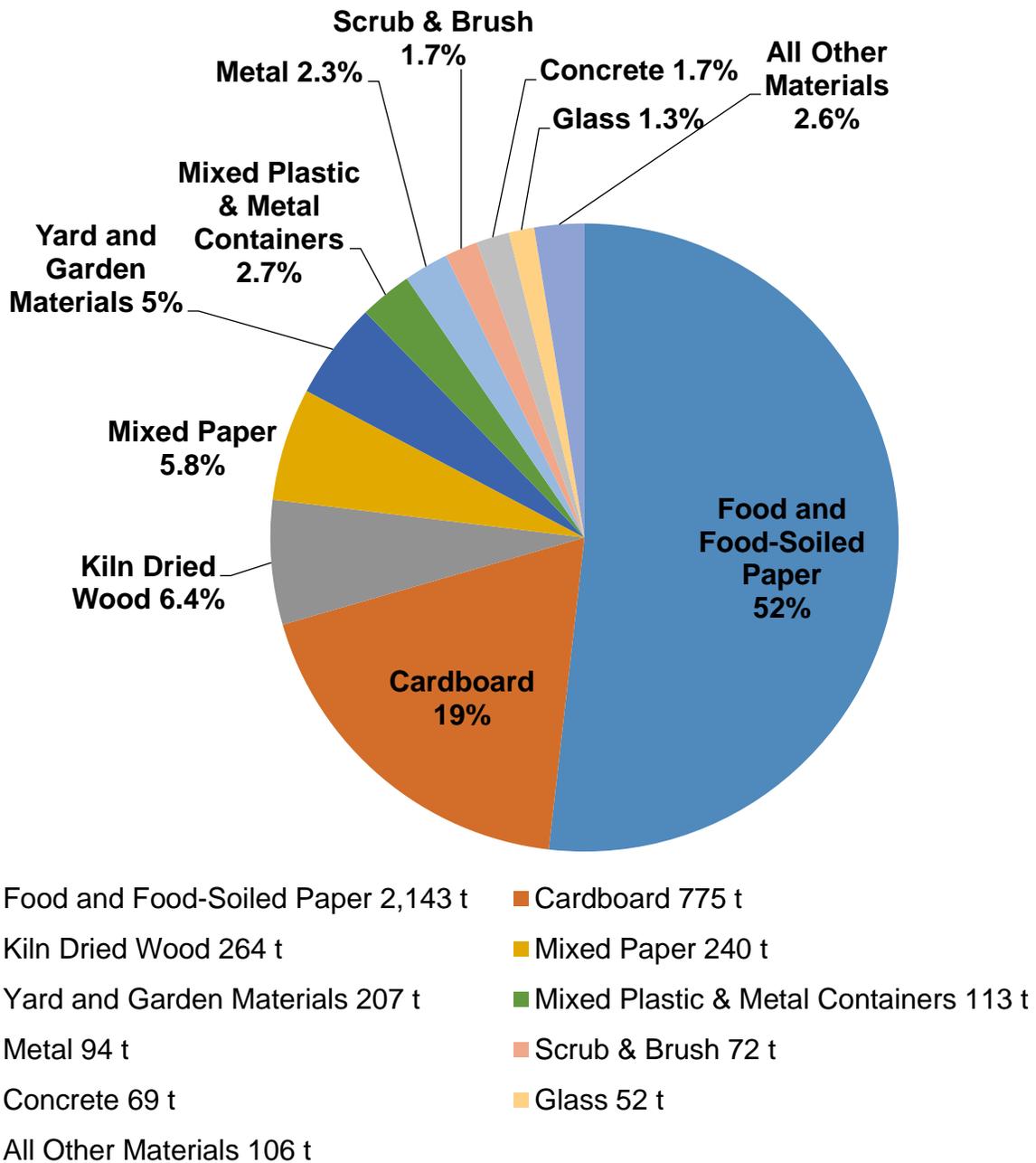


Figure 5. Average Annual Quantity of Materials Diverted for Recycling in the Town of Banff in 2016 and 2017. The category ‘All other materials’ includes: asphalt, ballasts, batteries, drywall, electronics, fluorescent tubes/bulbs, household hazardous waste, mattresses/boxsprings and tires.

SUMMARY

In summary, the waste characterization data presented show that the Town of Banff's recycling programs have been successful in achieving a significant level of waste diversion. However, huge opportunities remain to further increase the diversion of valuable materials from the waste stream. In particular, increasing recycling of food scraps, yard and garden waste, and mixed paper in both the non-residential and residential sectors are clear opportunities.

Response Options

1. That council direct administration to return in the 2nd quarter of 2018 with options for waste diversion targets, and tactics to increase diversion rates for food and food-soiled paper, yard and garden materials, and mixed paper.
2. That council not approve the attached motion.

IMPLICATIONS OF ISSUE

Internal Resources

Resource Recovery leads the management and operation of waste and recycling collection, diversion and disposal. Water Resources operates the wastewater treatment plant and therefore handles food scraps diverted through the use of food waste disposers. These two departments, along with Communications, will work collaboratively to establish waste diversion target options and potential tactics to increase diversion of food and food-soiled paper, yard and garden materials, and mixed paper to present back to Council for decision.

Communications provides support in developing educational messages to foster waste diversion. Bylaw Services can provide assistance enforcing the residential and non-residential waste bylaws, if required.

Budget

Option 1 would have no impact on the current operating budget. Waste and recycling collection, diversion and disposal are under the Resource Recovery budget, which is 75% user-pay and 25% tax funded.

Banff Community Plan

The Banff Community Plan includes the goals and objectives:

- *Be an environmental role model for communities around the world.*
- *Divert recovered resources from the waste stream.*
- *Increase residential and commercial recycling.*
- *Investigate and implement environmental best practices in all Town functions.*
- *Reduce the Town's impact on the surrounding national park.*
- *Reduce Banff's ecological footprint.*

The Banff Community Plan also monitors as indicators of environmental success:

- *Solid waste landfilled.*
- *Waste diverted through recycling.*

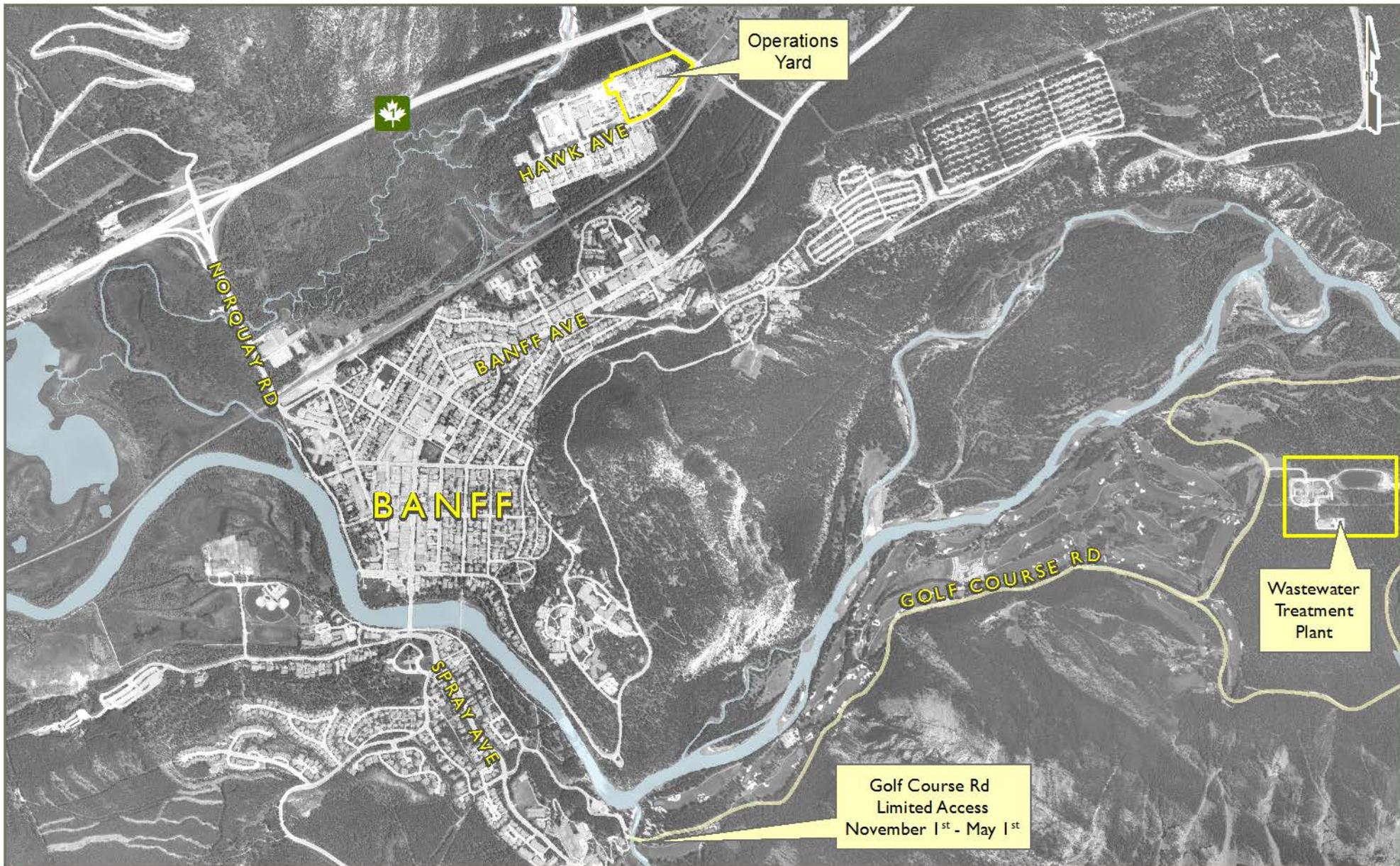
Council's Strategic Plan

- *By 2018, existing environmental programs continue to be successful, as measured by waste diversion, effluent quality, water use reduction and uptake on environmental grants.*

Circulation date: January 29, 2018

Submitted By: On original
Shannon Ripley, Environmental
Coordinator

Reviewed By: On original
Robert Earl, Town Manager



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Town of Banff

Key Locations

Municipal Organics Processing



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