Ontario Composite Paper Packaging Recycling Research Study

Draft Report

Submitted to:

Stewardship Ontario

12th April, 2011

Kelleher Environmental

in association with

ROBINS ENVIRONMENTAL

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1. Introduction

During the 2011 fee setting process, Stewardship Ontario was asked to consider changes to the fee setting methodology for the Blue Box that would further disaggregate the paper packaging category.

At this time the "Other Paper Packaging" fee category consists of polycoat containers (aseptic containers and gable top cartons) and paper laminates. Fees for these materials are currently calculated separately and then aggregated together to obtain one single fee for all three materials. The aggregation results in a higher fee for polycoat containers and a lower fee for paper laminates than would be the case if the fees were disaggregated. The aggegrated and disaggredated fees are presented in Table 1 below.

Table 1: Aggregated and Disaggregated Fees for Other Paper Packaging Category

Other Paper Packaging	Fees According to Current Formula (cents/kg)	Fees Resulting from Proposed Disaggregation (cents/kg)	Change (%)
Gable Top Cartons	23.75	18.22	-23%
Aseptic Containers	23.75	18.22	-23%
Paper Laminates	23.75	28.28	+19%
Average	**23.75**	**23.75**	**0%**

Proposals to aggregate or disaggregate material categories are evaluated by Stewardship Ontario according to three basic objectives:

- **Policy**
  Would aggregation and/or disaggregation promote increased diversion by rewarding materials that have higher diversion rates?

- **Operational**
  Are the materials managed in a similar manner in the reverse supply-chain (can grouping of "like with like" occur)?

- **Fairness**
  To what extent are differing diversion rates and/or handling practices a function of the inherent characteristics of the packaging material, and their comparative "recyclability".

At that time it was generally acknowledged that aseptic and gable top cartons satisfy the first two objectives: they are managed in the same manner and they achieve a significantly higher diversion rate than paper laminates.

However, there was no consensus on the reasons for the different (lower) recycling performance of paper laminates Stewards claimed that they are equally as recyclable as gable tops and aseptic containers, and that the low recycling performance is because Ontario municipalities do not collect paper laminates in their recycling programs.

Stewardship Ontario require a third-party determination of the facts that are currently in dispute before approaching WDO and the Ministry of Environment to consider any changes to the current fee setting methodology. Stewardship Ontario retained Kelleher Environmental to carry out the background research required to prepare a report on the facts which can be established with regard to the recycling of paper laminates in Ontario municipal programs, and markets which are available for collected paper laminates.

The research findings are presented in this report which will be used as the basis of consultations with stewards in April, 2011.

Phase 1 of the program – the research component described in this report, was initiated in December, 2010, with the bulk of the research taking place in January to March, 2011

Phase 2 of the program – consultation with stewards, is expected to take place in April-May, 2011.

2. Research Approach

2.1 General Approach

The research approach used was to systematically follow aseptics, gabletops and paper laminates through the Ontario recycling chain to the end markets. Players at all points of the recycling chain were interviewed.

The workplan involved a number of components:

- A literature search (internet, websites and journals);
- Interviews with key players in the recycling chain aseptics, gabletops and paper laminates (defined below), including:
  - Private sector and public sector recycling collectors and haulers;
  - MRF (material recycling facility) operators;
  - Paper processors, paper brokers and end markets;
  - Paper mills – technical staff as well as purchasing agents;
  - Staff from steward companies
  - Other key informants identified through the research.
- Documentation of research findings in a Research Study Report

A list of those interviewed for the study is presented in Appendix A to this report.

Information collected through the interviews and literature search is documented in this *Draft Research Report* in a format suitable for consultation with stewards. Additional information provided by stewards through the consultation process will be used to revise and finalize the report.

2.2 Definitions Used For The Research Study

Definitions of gable top cartons, aseptic containers and paper laminates provided in the *Blue Box Steward Guidebook, March 2010* were used for the study research. These were:

- **Gable Top Cartons** - Includes polycoated cartons.
  Examples: Milk cartons, juice cartons

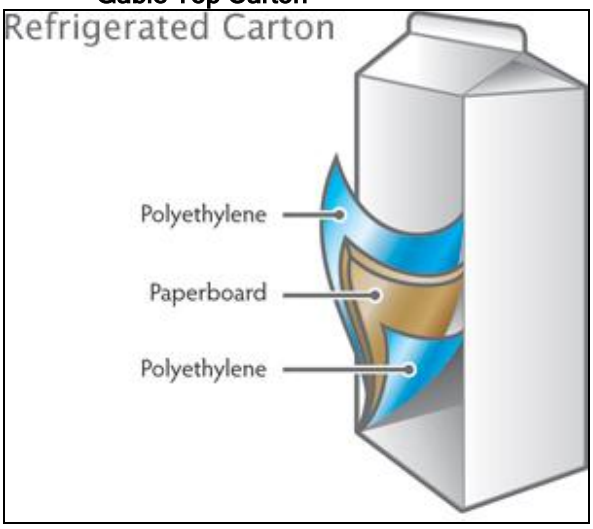
- **Aseptic Containers** - Includes polycoated and foilized boxes.
  Examples: Juice boxes, soup containers

- **Paper Laminates** - Includes laminated paper packaging that is in majority paper (51% by weight) but has more than 15% by weight of non-paper. This includes metalized foil/paper/plastic laminates where paper represents the greatest percentage by weight. In the event that there are 2 or more components, 60% of packaging has to be paper for the material to be considered a paper laminate.
  Examples: Fiber cans (with metal/plastic bottom and lid), fiber pots, granola bar wrappers, battery blister package, paper hot drink cup, paper ice cream cartons.

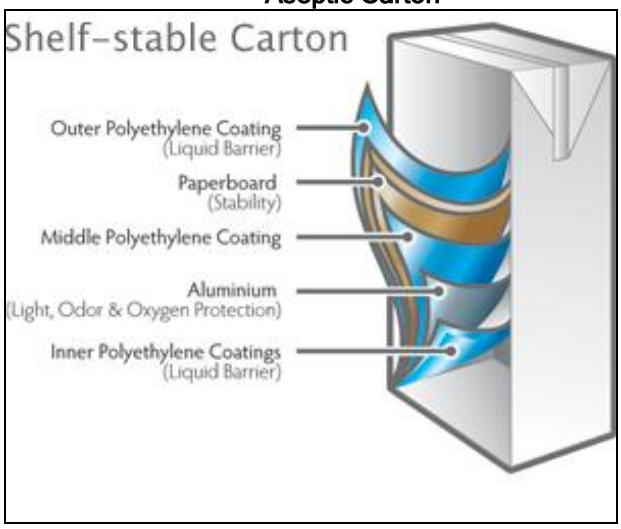
Construction of a Carton Package

Gable top cartons are mainly made from paper in the form of paperboard, as well as thin layers of polyethylene (plastic). Aseptic cartons also contain paperboard and polyethylene as well as a thin layer for aluminum as an oxygen and light barrier and contain on average 74% paper, 22% polyethylene and 4% aluminum. Refrigerated cartons contain about 80% paper and 20% polyethylene.[1]

Gable Top Carton



Aseptic Carton



Source: Carton Council at http://www.werecyclecartons.com/cartons.html

2.3 Examples of Aseptics, Gable Tops and Paper Laminates Used For Project Interviews

Further information about the construction, examples and images of the three paper packaging categories is provided in the Table 2 below.

Table 2: Aseptic, Gable Top and Paper Laminate Packaging Definitions and Examples Used for Study Research

Category	Construction	Examples	Images
Gable Top Cartons	Gable top cartons are often used for liquid products such as milk, juice, etc. These used polyethylene-coated paperboard Many cartons are made out of a single piece of paperboard. The paperboard is coated with polyethylene to form a moisture barrier.	Gable top containers - non-beverage Examples: Sugar, confectionary products, laundry and cleaning products Gable top containers - beverage Examples: Ready to serve beverages such as milk and juice in cartons	

[1] Source: Carton Council at http://www.werecyclecartons.com/cartons.html

		(from Stewardship Manitoba	
Aseptic Containers	Cartons for liquids can be fabricated from laminates of paperboard, foil, and polyethylene. Most are based on either Tetra Pak or Combibloc systems.	Aseptic containers – non-beverage Examples: Soup, sauces Aseptic containers – beverage Examples: Ready to serve beverages such as juice, milk (from Stewardship Manitoba	
Paper Laminate Packaging	Includes laminated paper packaging that is in majority paper (51% by weight) but has more than 15% by weight of non-paper. This includes metalized foil/paper/plastic laminates where paper represents the greatest percentage by weight.	Common paper laminates include hot drink cups, spiral wound cans (e.g. frozen juice, pringle potato chip cans, cookie dough packages, hot chocolate and ice tea cans) and ice cream cartons.	

2.3 Municipal Research

2.3.1 Ontario Municipalities

The first step in the research approach was to review websites to identify Ontario communities that collect or do not collect aseptics, gable tops and paper laminates. For the research, paper laminates were generally defined and described as *hot drink cups, ice cream containers and spiral wound containers* to simplify communication.

A scan of the recycling web pages of Ontario communities with household counts (SF and MF) greater than 15,000 (plus Owen Sound) was conducted to determine which communities encouraged the collection of gable tops, aseptic containers and at least one paper laminate material in the recycling program or, in the case of the paper laminate, alternatively in the green bin program. In total, 24 Ontario communities were examined representing approximately 75% of Ontario households.

The initial web page scan revealed that over half of the municipalities identified at least one paper laminate as being accepted in the residential recycling program as reported in the list of acceptable recycling materials. However, upon further investigation involving a quick call to the remaining municipalities, it became apparent that majority of municipalities accepted at least one paper laminate material in their recycling programs. Two of the Regions, Halton and Waterloo, only accept paper laminates in their green bin programs.

In total 24 Ontario communities were contacted (5 GTA, 12 cities, 2 regions, 3 counties and 2 authorities). Of this total, 21 were identified as collecting at least one paper laminate material in their recycling stream.

Those communities identified as collecting at least one paper laminate in either the recycling program or the Green Bin program were contacted and asked to participate in a telephone survey with the questionnaire presented in Appendix B as a general guide. The survey was divided into two parts related to the collection system and the processing system employed for the gable tops, aseptic containers and paper laminates. A municipal staff representative overseeing collections was contacted to answer the collection related questions and a MRF operator (municipal or private) was also contacted to answer the processing related questions.

2.3.2 Canadian and US Municipalities

A scan of recycling web pages of major urban centres in Canada and the United States was conducted to determine which communities collected gable top or aseptic containers or paper laminate materials. Within Canada and the United States, those municipalities collecting paper laminate materials in their recycling or green bin programs were contacted to participate in a telephone survey. The same survey and survey approach was used here as was used for the Ontario municipalities.

In total, six municipalities were contacted - five in Canada and one in the United States.

2.4 Interviews With Stewards

Stewards of aseptics, gable tops and paper laminates were interviewed to identify efforts to recycle these materials, and mills used for recycling. The mills were then contacted as part of the end market research.

2.5 End Market Research

When interviewing the municipalities discussed in the previous section, each municipal representative was asked to identify the different types of bales into which aseptics, gable tops and paper laminates were directed (e.g. polycoat, hardpack, etc), and the markets to which the different types of bales were sold. Municipal representatives were also asked if they knew the fate of the bales at the end markets (i.e. the products made at the mills where they were sent).

A list of paper brokers and mills was created through this research. Each paper broker was contacted to identify the mills they used (generically, or specifically where they were willing to share information).

3. Ontario Municipal Research

3.1 Amounts of Blue Box Fibre Sold Into The Ontario Market and Recycled 2003 to 2008

Tables 3 and 4 present the amounts of fibre sold into the Ontario market and recycled from 2003 to 2008.

Table 3: Blue Box Material Sold Into the Ontario Market and Recycled 2003 to 2005

Data Year	2003			2004			2005 *		
Material	**Quantity Available (tonnes)**	**Quantity Recycled (tonnes)**	**Recycling Rate (%)**	**Quantity Available (tonnes)**	**Quantity Recycled (tonnes)**	**Recycling Rate (%)**	**Quantity Available (tonnes)**	**Quantity Recycled (tonnes)**	**Recycling Rate (%)**
Newsprint - CNA/OCNA	264,800	198,666	75%	283,483	213,943	75%	268,224	215,716	80%
Newsprint - Non-CNA/OCNA	136,400	102,334	75%	134,699	101,656	75%	128,557	103,390	80%
Magazines and Catalogues	95,100	68,898	72%	96,349	72,240	75%	97,267	73,043	75%
Telephone Books	15,000	11,254	75%	16,090	12,143	75%	21,090	16,961	80%
Other Printed Paper	127,800	49,463	39%	129,368	51,519	40%	122,082	47,408	39%
Printed Paper Total	**639,100**	**430,615**	**67%**	**659,989**	**451,501**	**68%**	**637,220**	**456,518**	**72%**
Old Corrugated Containers	140,000	100,279	72%	141,800	107,357	76%	165,706	115,230	70%
Gabletop	12,800	1,222	10%	12,900	1,638	13%	15,145	2,100	14%
Paper Laminants	42,000	420	1%	42,500	425	1%	37,673	377	1%
Aseptic Containers	2,800	268	10%	2,800	356	13%	3,543	456	13%
Old Boxboard	130,500	54,712	42%	132,200	58,573	44%	127,388	67,674	53%
Paper Packaging Total	**328,100**	**156,901**	**48%**	**332,200**	**168,349**	**51%**	**349,455**	**185,837**	**53%**

Table 4: Blue Box Material Sold Into Ontario Market and Recycled, 2006 to 2008

Data Year	2006 *			2007 *			2008		
Material	Quantity Available (tonnes)	Quantity Recycled (tonnes)	Recycling Rate (%)	Quantity Available (tonnes)	Quantity Recycled (tonnes)	Recycling Rate (%)	Quantity Available (tonnes)	Quantity Recycled (tonnes)	Recycling Rate (%)
Newsprint - CNA/OCNA	259,570	235,716	91%	269,247	236,301	88%	255,785	224,344	88%
Newsprint - Non-CNA/OCNA	124,409	112,976	91%	129,047	113,257	88%	125,176	109,790	88%
Magazines and Catalogues	89,653	79,815	89%	91,112	80,013	88%	91,339	80,112	88%
Telephone Books	14,431	13,105	91%	19,933	17,493	88%	15,392	13,500	88%
Other Printed Paper	117,200	57,232	49%	120,303	53,018	44%	121,206	59,844	49%
Printed Paper Total	**605,263**	**498,844**	**82%**	**629,642**	**500,082**	**79%**	**608,898**	**487,590**	**80%**
Old Corrugated Containers	162,846	124,807	77%	162,847	125,610	77%	169,170	155,563	92%
Gabletop	14,433	2,233	15%	14,836	2,317	16%	15,184	3,576	24%
Paper Laminants	37,094	371	1%	38,387	384	1%	39,289	393	1%
Aseptic Containers	3,413	485	14%	3,941	503	13%	4,252	784	18%
Old Boxboard	123,774	73,299	59%	127,666	73,931	58%	130,538	85,092	65%
Paper Packaging Total	**341,560**	**201,195**	**59%**	**347,677**	**202,745**	**58%**	**358,433**	**245,408**	**68%**

3.2 Collection of Aseptics, Gabletops and Paper Laminates

In total 24 Ontario communities were contacted (5 GTA, 12 cities, 2 regions, 3 counties and 2 authorities). Of this total, 21 collected at least one paper laminate material in their recycling stream. This section documents information provided on municipal websites and collected through interviews with staff at these municipalities, or at companies contracted to collect or process the materials.

All Ontario municipalities investigated collect gable top and aseptic containers, and the majority collect at least one paper laminate – hot drink cup, spiral wound and/or paper ice cream carton. Only three communities collected all three paper laminates – York Region, Northumberland County and the City of Peterborough – in their recycling program. All communities accept gable top and aseptic containers in their Blue Box recycling programs.

Table 5 provides a list of 21 Ontario communities which accept at least one paper laminate packaging material in its Blue Box recycling or Green Bin composting program. The Regions of Halton and Waterloo do not accept any paper laminate materials in their recycling program; they are accepted only in the green bin program.

Until recently, Niagara Region permitted residents to place soiled hot drink cups in the green bin but experienced problems with the plastic film not breaking down in the compost stream it has discontinued the policy of allowing them in the Green Bin. Durham Region also discontinued accepting hot drink cups in the green bin due to problems with the plastic not breaking down.

Table 5: Ontario Communities that Accept Composite Paper Packaging in Diversion Programs

		Paper Laminate				Gable Top		Aseptic	
Packaging Materials: from Blue Box Steward Guidebook, March 2010	Hhlds served by curbside collection (2009)[1]	Hot Drink/Paper Cups [2]	Fibre Cans (or spiral cardboard container)[3]	Ice Cream Cartons	Notes	Milk Cartons	Juice Cartons	Juice Boxes	Soup Containers
City of Toronto	943,794	no	√	green bin	soiled ice cream containers accepted in green bin	√	√	√	√
City of Ottawa	369,271	green bin	√	green bin	permits hot paper cups and ice cream container in green bin	√	√	√	√
York Region	308,852	√	√	√		√	√	√	√
Region of Peel	395,000	no	no	√	ice cream containers not listed but accepted	√	√	√	√
Durham Region	203,969	no	no	√	ice cream containers not listed but accepted - spiral wounds will be added next contract	√	√	√	√
City of Hamilton	206,672	green bin	√	√	if clean then accepted in recycling; if soiled then placed in green bin or garbage	√	√	√	√
Halton Region	171,478	green bin	no	green bin	permits hot drink cups and ice cream cartons in green bin - sent to Hamilton composting facility	√	√	√	√
Niagara Region	162,552	no	√	no	plastic film caused problems in the compost so no longer accept in the green bin program	√	√	√	√
Essex Windsor	153,529	√	no	no	hot drink cups collected in the fibre stream and pulled out with boxboard	√	√	√	√
Region of Waterloo	191,170	green bin	no	green bin	premits hot drink cups and ice cream cartons in green bin - sent to Hamilton composting facility	√	√	√	√
Simcoe County	122,877	green bin	√	green bin	permits hot paper cups and ice cream container in green bin	√	√	√	√
City of Barrie	53,408	green bin	√	green bin	permits hot paper cups and ice cream container in green bin	√	√	√	√
City of Guelph	44,933	√	not listed	√		√	√	√	√

		Paper Laminate				Gable Top		Aseptic	
Packaging Materials: from Blue Box Steward Guidebook, March 2010	**Hhlds served by curbside collection (2009)[1]**	**Hot Drink/Paper Cups [2]**	**Fibre Cans (or spiral cardboard container)[3]**	**Ice Cream Cartons**	**Notes**	**Milk Cartons**	**Juice Cartons**	**Juice Boxes**	**Soup Containers**
Northumberland County	35,019	√	√	√	if clean then accepted in recycling; if soiled then placed in the garbage stream	√	√	√	√
City of Peterborough	34,632	√	√	√	If clean accepted in recycling; if soiled then placed in green bin or garbage	√	√	√	√
City of Sudbury	57,500	no	√	no		√	√	√	√
City of Kingston	50,299	√	no	√	hot drink cups and ice cream containers not listed but accepted in recycling program	√	√	√	√
Quinte Waste Solution	59,938	no	√	√	spiral wounds and ice cream cartons not listed but accepted in recycling program	√	√	√	√
Ottawa Valley Waste Recovery Centre	16,196	green bin	√	green bin	permits hot paper cups and ice cream container in green bin	√	√	√	√
City of Orillia	14,160	√	√	no	paper cups and spiral wounds collected in container stream	√	√	√	√
City of Owen Sound	9,380	√	no	no	hot cups from Tim Horton's collected and mixed with residential OCC/OBB	√	√	√	√

In total, 21 Ontario municipalities recycle at least one paper laminate - paper cups and/or fibre cans and/or ice cream cartons – in their recycling program including:

• City of Toronto, • York Region, • Niagara Region, • Region of Peel, • Durham Region, • City of Hamilton, • City of Ottawa, • City of Barrie, • City of Sudbury	• Essex Windsor Solid Waste Authority • Simcoe County, • City of Guelph, • Northumberland County, • Peterborough County, • Quinte Waste Solution • Ottawa Valley Waste Recovery Centre, • City of Orillia, • City of Owen Sound • City of Kingston

Note: Halton Region and the Region of Waterloo only accept paper laminates in the green bin program

Of the 21 communities that addressed the key paper laminates through their waste diversion programs:

- 13 accept spiral wound containers in their recycling program;
- 15 accept hot drink cups in either their recycling program (8) or their Green Bin program (7);
- 16 accept ice-cream containers in either their recycling program (9) or their Green Bin program (7).

Quinte Waste Solutions collects hot drink cups from IC&I customers but does not accept hot drink cups in the residential recycling program. The Cities of Orillia and Owen Sound collect hot drink cups from IC&I customers and residential customers.

3.3 Ontario Jurisdictions Not Collecting or Identifying Paper Laminates as Recyclable

While many Ontario municipalities accept at least one paper laminate in their recycling program, many of these have chosen to not list paper laminate materials in their Blue Box pamphlets, thus impacting the volume of materials received. Many of these municipalities represent large, urban municipalities in Ontario including the, Region of Peel, Durham Region, City of Kingston and Quinte Waste Solutions. All communities accept gable top and aseptic containers in their blue box programs.

Two jurisdictions, Halton Region and the Region of Waterloo, only accept paper laminates in the green bin program. Three jurisdictions, the Cities of London, Sarnia and North Bay do not accept paper laminates in the recycling stream and do not operate at green bin program at this time.

Table 6: Ontario Communities that Do Not Accept Paper Laminates in Diversion Programs

Communities	Hhlds served by curbside collection (2009)	Do Not Identify Paper Laminates as an accepted item in Blue Box Literature	Will Allow Some Paper Laminates in the Blue Box	Will Allow Some Paper Laminates in the Green Bin	Communications state that Paper Cups Not Accepted
Region of Peel	395,000	√	√		√
Durham Region	203,969	√	√		√
Halton Region	171,478	√		√	
Region of Waterloo	191,170	√		√	
City of London	157,739	√			√
Quinte Waste Solution	59,938	√	√		
City of Kingston	50,299	√	√		
City of Sarnia	40,698	√			
North Bay	20,841	√			√

All listed communities accept gable top and aseptic containers

3.4 Processing the Materials at the MRF

The majority of surveyed Ontario municipalities collect gable top and aseptic containers in a single stream or containers stream at the curb and processed through the container stream at the MRF. Only Quinte Waste Solutions collect gable tops and aseptic containers in the fibre stream.

The same is mostly true for paper laminates, with five exceptions; any Ontario municipality collecting hot paper cups, spiral wounds and/or ice cream containers are placing them in the container stream (in the case of a two stream collection system) and processing them in the container line at the MRF. The five exceptions are the City of Peterborough, the City of Orillia, Essex Windsor, and Quinte Waste Solutions which process the paper laminates as follows:

- City of Peterborough – spiral wounds are collected in the container stream but are sorted out and added to the mixed paper bale with OBB and other mixed paper. Hot paper cups are collected in the fibre stream and added to the mixed paper bale along with the spiral wounds. The mills are responsible for managing the metal in the spiral wound.
- City of Orillia – hot paper cups are collected in the fibre stream and baled as #6 news. The spiral wounds are collected in the container stream and shipped loose to Durham Shred and Recycle for further processing. The spiral wounds are pulled off by magnets and baled with the metals.
- Essex Windsor collects hot drink cups in the fibre stream which is baled as a hardpack with mostly boxboard.
- Quinte Waste Solutions – Requires residents to place gable tops, aseptics and ice cream containers in a boxboard container which is collected as a fibre stream and processed into a polycoat bale. Spiral wounds are collected in the container stream.
- City of Kingston – Gable tops, aseptics, hot drink cups and ice cream containers are collected in the fibre stream and baled together in a polycoat bale.

The MRFs produce a variety of different bales for the gable tops, aseptics and paper laminate recyclables materials, including:

- polycoat bales (gable tops and aseptics),
- mixed paper bales (all in),
- hardpack bales (all in) and

- # 6 news (some paper laminates).

Table 7 identifies the manner in which the materials are processed and marketed.

Table 7: Marketing of Paper Laminates, Gable Tops and Aseptic Containers by Ontario Municipalities

	Paper Laminate			Polycoat		
Packaging Materials:	**Hot Drink/Paper Cups [2]**	**Fibre Cans (or spiral cardboard container)[3]**	**Ice Cream Cartons**	**Gable Top**	**Aseptic Containers**	**Notes**
City of Toronto	garbage	metals	green bin	Polycoat	polycoat	polycoat is going to a tissue mill in South Korea - marketed by Continental Paper Grading on a ten year contract
City of Ottawa	green bin	metals	green bin	Gable top	gable top	Metro Waste (Cascades) have agreement with mill to accept some aseptics in gable top bale - not too many - OGO Fibres marketing gable top bale - green bin SSO processed at Ottawa composting facility
Region of Peel	no	no	polycoat	Polycoat	polycoat	polycoat is going to a tissue mill in South Korea - marketed by Continental Paper Grading
Durham Region	no	no	polycoat	Polycoat	polycoat	Region responsible for finding markets - currently going to Continential Paper Grading and shipped to South Korea
York Region	#6, hardpack or fibre B	Steel bales	hardpack	polycoat	polycoat	Paper laminates are baled in different fibre grades depending on need and market conditions. Effort is taken to ensure that these materials do not result in downgrading of bales
City of Hamilton	green bin	metals	polycoat	polycoat	polycoat	so few ice cream containers in recycling stream that they can be added to polycoat bale without impacting quality of the bale - Green bin SSO processed at Hamilton composting facility
Niagara Region	no	metals	no	Polycoat	polycoat	Region had problems with the plastic film from the hot paper cups in the compost stream so discontinued allowing them in the Green Bin
Essex Windsor	hardpack	no	no	Polycoat	polycoat	The hard pack is marketed by Essex Windsor on a spot market basis.
Simcoe County	green bin	metals	green bin	mixed paper (BFI) polycoat (Durham Shred)	mixed paper (BFI) polycoat (Durham Shred)	multiple processors involved -containers = BFI (Muskoka), Allied (Buffalo), Durham Shred & Recycling; fibres = REMM, Continental Paper Canada Fibres, Paper Fibres - Green bin SSO processed at Hamilton composting facility
City of Barrie	green bin	metals	green bin	mixed paper	mixed paper	containers are sent loose to BFI's Muskoka MRF for processing - green bin SSO processed at All Treat Farms
Northumberland County	gable top	metals	gable top	gable top	gable top	all materials put in the gable top bale

	Paper Laminate			Polycoat		
Packaging Materials:	**Hot Drink/Paper Cups [2]**	**Fibre Cans (or spiral cardboard container)[3]**	**Ice Cream Cartons**	**Gable Top**	**Aseptic Containers**	**Notes**
City of Peterborough	mixed paper	mixed paper	mixed paper	Gable top	gable top	City does not actively promote recycling of spiral wounds or ice cream containers so it receives very few Receives so few aseptics that they in gable bale that inconsequential to quality of the bale
City of Sudbury	no	metals	no	Polycoat	Polycoat	Polycoat marketed by Canada Fibres and sent to Sfk in West Virginia
City of Kingston	Polycoat	no	polycoat	polycoat	polycoat	Kingston markets the polycoat which is sent to Continental Paper Grading
Quinte Waste Solutions	no	metals	polycoat	polycoat	polycoat	Quinte markets polycoat - sent to Paper Tigers in Chicago - sent to Great Lakes Tissue in Detroit
Ottawa Valley Waste Recovery Centre	green bin	metals	green bin	Polycoat	polycoat	paper laminates could go in polycoat stream in very small amounts - polycoat bale marketed through Continental Paper Grading - Green Bin SSO processed at OVWRC composting facilty
City of Orillia	# 6 news	metals	garbage	Polycoat	polycoat	containers sent to Durham Shred & Recycle for processing#6 news sent to Paper Fibres for marketing
City of Owen Sound	hardpack	garbage	garbage	hardpack	hardpack	mixed with gable top and aseptics and marketed as hardpack to Canada Fibres - cannot handle lids in the hot drink cup stream

Table 8 provides definitions for the different grades of paper stock as developed by the Institute of Scrap Recycling Industries (ISRI) in its Guideline for Paper Stocks PS-2007–Export Transactions (2007). The guideline lists 51 paper grades plus a category titled Specialty Grades.

Table 8: Definitions of Fibre Grades and Specifications

In the paper recycling business, fibres are classified by "grades". Each grade is made up 3 components:

- **Primary Material:** The main ingredients in the bale;
- **Outhrows:** Additional fibre material that in small quantities will not impact the mill process but in quantities above the percentage specified will cause the final material to get rejected at the grade or recipe indicated;
- **Prohibitives:** .Any materials which by their presence and in excess of the amount allowed, will make the packaging unusable as the grade specified and/or any materials that may be damaging to equipment.

Grade	Definition	Prohibitive Materials	Outthrows
(1) Soft Mixed Paper	Consists of a clean, sorted mixture of various qualities of paper not limited as to type of fiber content.	may not exceed 2%	may not exceed 10%
(2) Mixed Paper	Consists of a clean, sortedmixture of various qualities of paper containing less than 10%of groundwood content.	may not exceed ½ of 1%	may not exceed 3%
(6) # 6 News	Consists of newspaper as typically generated fromnews drives and curbside collections.	may not exceed 1%	may not exceed 5%
(14) Fiber Cores	Consists of paper cores made from either chipboard and/or linerboard, single or multiple plies. Metal or plastic end caps, wood plugs, and textile residues are not acceptable in this grade Outthrows	may not exceed 1%	may not exceed 5%
Specialty Grades	The grades listed below are produced and traded in carload and truckload quantities throughout the United States, and because of certain characteristics (i.e., the presence of wet strength, polycoatings, plastic, foil, carbon paper, hot melt glue), are not included in the regular grades of paper stock. However, it is recognized that many mills have special equipment and are able to utilize large quantities of these grades. 3–S Plastic Coated Cups 6–S Polycoated Milk Carton Stock		
Not Defined by ISRI			
HardPack OCC/OBB	Some municipalities market an OCC/OBB mix (called hardpack). The ratio of OCC to OBB varies depending on a mill's feedstock requirements but in Ontario it is generally 60% OCC to 40% OBB and other paper materials.	may not exceed 1%	may not exceed 3%

Source: The Institute of Scrap Recycling Industries (ISRI) in its Guideline for Paper Stocks

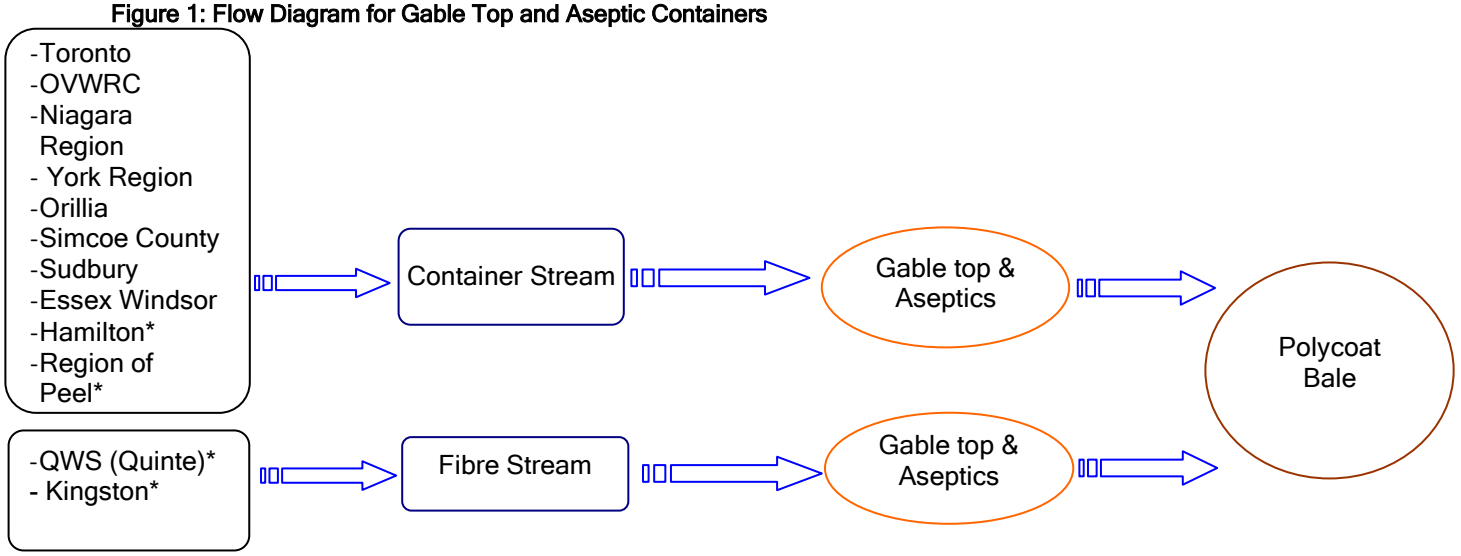
3.5 Processing of Gable Tops and Aseptics

Most MRFs bundle the gable tops and aseptics containers separate from the paper laminates in order to market a high quality grade of fibre. Most MRFs bale the gable tops and aseptics together into a polycoat bale, which is considered slightly lower quality and value than a gable top bale.

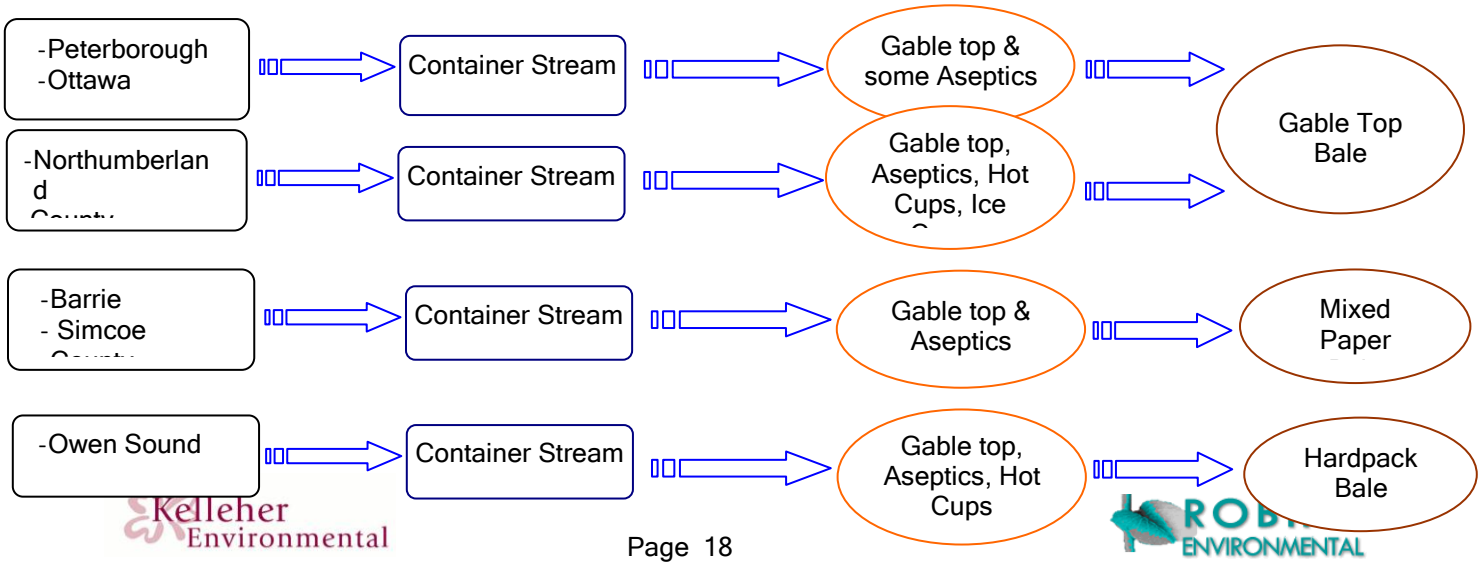
A handful of jurisdictions mix the gable tops and aseptics with paper laminates including Durham Region, Peel Region, City of Hamilton, Northumberland County, Quinte Waste Solutions, City of Kingston and Owen Sound. The cities of Hamilton and Kingston, the Regions of Durham and Peel and Quinte Waste Solutions throw the odd clean coffee cup and/or ice cream container in with the polycoat mix but since these jurisdictions do not publicize that coffee cups or ice cream containers are accepted in the Blue Box program, they receives a minimal amounts which can be absorbed in the polycoat bale without being detrimental to the quality of the bale. For the most part, these bales consist primarily of gable top and aseptic containers. Northumberland County and Owen Sound, on the other hand, publicized the inclusion of paper laminates in the recycling stream (see below).

Figure 1 shows the flow of gable top and aseptic containers from collection at the curb to the bale produced at the MRF.

Figure 1: Flow Diagram for Gable Top and Aseptic Containers



* Hamilton, Peel, Durham, Kingston and Quinte add small amounts (less than 5%) of hot drink cups and/or ice cream containers in their polycoat bale

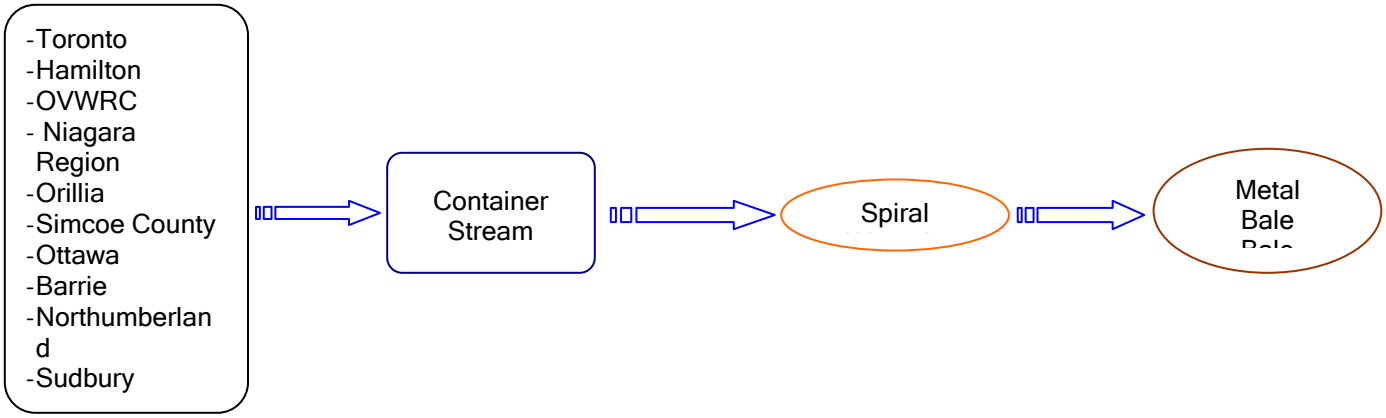


3.6 Processing of Paper Laminates

3.6.1 Processing of Spiral Wounds

Most municipalities (11 of 13) are baling spiral wounds in with the metal cans and shipping to scrap metal companies. The only reason some municipalities are including spiral wounds in paper mixes is that their magnets cannot pull them off the line. Figure 2 shows the flow of spiral wounds from the curb to the bale produced at the MRF.

Figure 2: Flow Diagram for Spiral Wound Containers



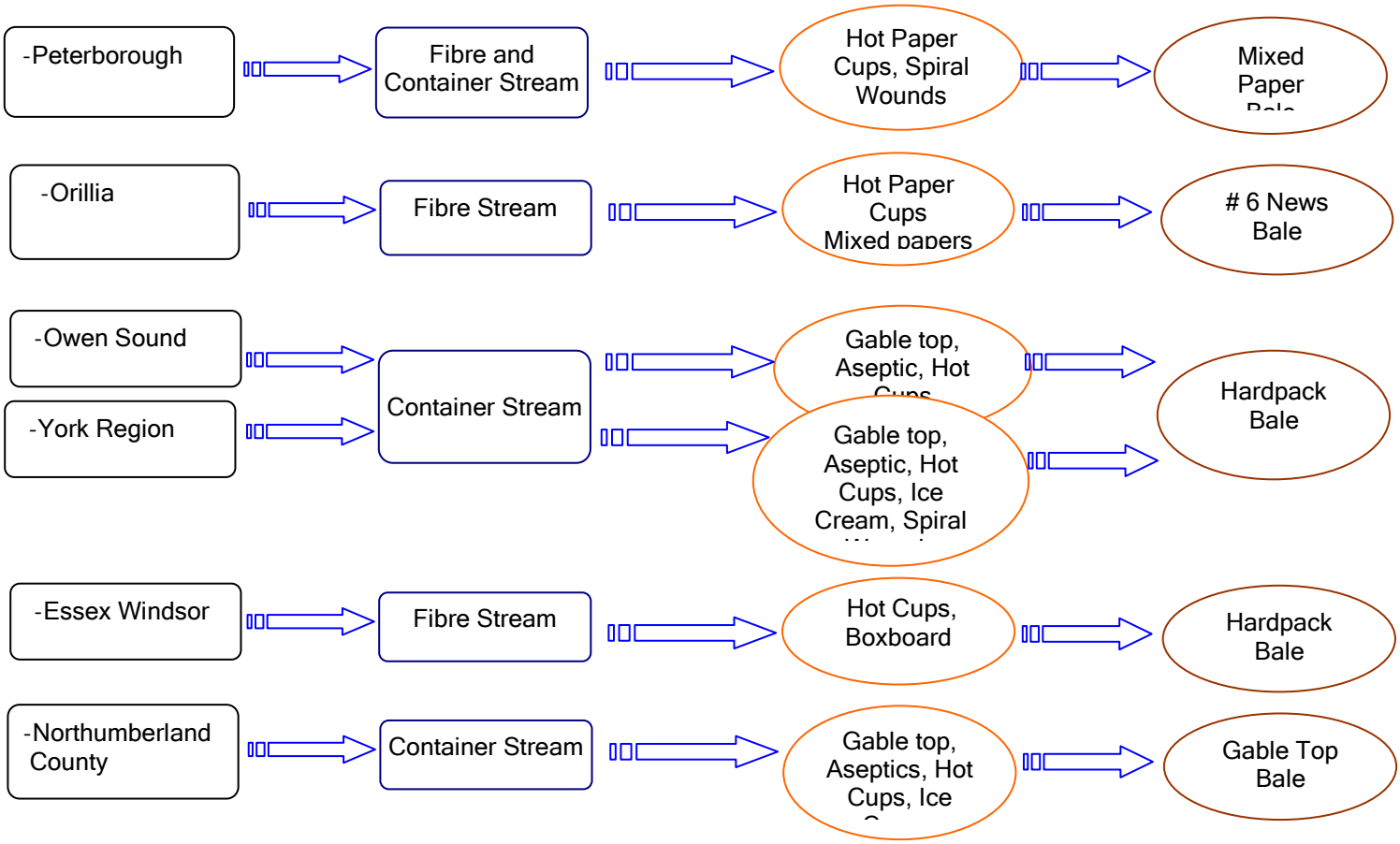
3.6.2 Processing of Hot Paper Cups and Ice Cream Containers

Those Ontario municipalities that permit hot paper/drink cups and/or ice cream containers in the recycling program, require only clean paper laminates to be placed in the blue box and typically sort them into lower paper grade bales, such as mixed paper, #6 news, or hardpack. These municipalities also stipulate that residents should place soiled hot paper cups and ice cream containers in the green bin. The City of Barrie include the odd clean ice cream container in with the #6 news mix but since the City does not publicize that ice cream containers are accepted in the Blue Box program, it receives a nominal amount that can be absorbed in the #6 news bale without being detrimental to the quality of the bale.

Only Northumberland County and Owen Sound mix the gable tops and aseptics with paper laminates, producing a hardpack bale (Owen Sound) and a gable top bale (Northumberland). Northumberland County is the only jurisdiction contacted in either Ontario or Canada to include paper laminates in with the gable top bale. In the case of Northumberland, the County has always included hot paper/drink cups and ice cream containers in the gable top bale, which is marketed through REMM. MRF staff hand sort out the four materials (gable tops, aseptics, hot paper cups and ice cream containers) into the gable top stream. While the contact at the MRF was unable to say on average what portion of the gable top bale comprised of the other three materials, he indicated most of the time it wasn't much. The bales have never been rejected but the MRF contact has been warned that if the bales could be rejected if they contain too high a percentage of hot drink/paper cups – the ink on the cups being the main concern.

Figure 3 shows the flow of hot paper/drink cups and ice cream containers from collection at the curb to the bale produced at the MRF.

Figure 3: Flow Diagram for Composite Paper Packaging



Note: as indicated earlier, five communities (Region of Peel, Region of Durham, Hamilton, Kingston and Quinte Waste Solutions) collect hot drink cups, and/or ice cream containers in such small quantities that they add them to the polycoat bale.

3.7 Information On Recycling of Aseptics and Gabletops By Ontario Municipalities From WDO Datacall

The following information on the recycling of aseptics and gabletops in Ontario municipal programs from the 2009 Waste Diversion Ontario Municipal Datacall was compiled by the Carton Council of Canada:

- 217 programs in Ontario reported data;
- 154 programs accept either aseptic or gable top or both;
- 63 programs do not accept either aseptic or gable top containers (~ 8% of total hhlds).

Of the 154 programs that accept aseptic or gable top containers:

- 23 market as mixed polycoat (73% of total hhlds)
- 16 municipalities market as hardpack
- 50 municipalities market as mixed fibre
- 65 municipalities combine with other fibre products (ONP, OCC, etc.)

The Carton Council of Canada research has identified that the largest programs in Ontario (representing 73% of households) market a dedicated polycoat bale.

A request was submitted to WDO to identify the equivalent information for paper laminates. Unfortunately paper laminate information is not collected at the same level of detail through the Datacall.

3.8 Observations From Municipal Interviews

The paper laminates in the bales are reported to be in such small quantities (<5%) that the mills can accept them without posing problems to the pulping process. It is not clear from interviews with mills (see Section 6) whether this means that they are simply not pulped and end up in residue, or that they are incorporated into the products with no measurable impact on quality.

The City of Orillia collects hot drink/paper cups from all residences and business, including Tim Horton stores, in town. All materials are co-mingled together with the fibres from business representing about 10% of the total fibre stream. The fibres are baled in a #6 news bale, where the portion of hot drink cups is minimal. City staff added hot paper/drink cups to the recycling program as part of its new collection and processing contract starting in July 2010.

A number of municipalities (Peterborough, Durham Region, Toronto) have not attempted to put hot paper/drink cups in with the polycoat or gable top bales due to concerns that the ink will pose problems for the mills. There is concern that placing them in the high paper grade bales will result in a lower quality product and price.

The Region of Peel has encountered no problems adding ice cream containers to the polycoat bale and claims that its end market (South Korea via Continental Paper) can tolerate up to 15% outthrows which includes aseptics and paper laminates.

Essex Windsor sorts its fibre stream at the MRF as a negative ONP. All other fibres are picked off the line leaving a clean ONP #8 news bale, which is marketed to Abitibi in Niagara. Essex Windsor is experiencing problems getting the cups and small OBB out of the ONP stream resulting in a lower ONP grade (#6 grade) and lower prices. The Abitibi system can not tolerate OBB and the company states that it is becoming an increasing problem in the bales. Essex Windsor is concerned that Abitibi will reject loads in the future and investigated hiring an extra sorter but at $30,000 per year it was not worth the extra cost. Essex Windsor is very reluctant to go to a mixed paper bale which would result in loss of revenue and the need to lay off sorters. It is closely monitoring the situation.

Durham Region intends to include spiral wounds in its next contract (November 2012).

Several years back, Durham Region accepted hot drink cups in the Green Bin but when they failed to break down properly, the Region stopped accepting them in the green bin. The Region then tried sending them to the Atlantic Packaging mill in Whitby (a newsprint mill that has closed since then), but the mill rejected them stating that the ink was a problem for the mill and the cups ended up as contamination. The Region saw its once high grade #8 news bales being downgraded to a #6 news. It dropped the hot drink cups from the program altogether in order to maintain the higher #8 new grade.

4. Recycling of Composite Paper Packaging in Canadian Municipalities Outside Ontario and Selected US Communities

4.1 Canadian Communities

While all Ontario municipalities and most Canadian municipalities are collecting gable top and aseptic containers, very few Canadian municipalities are collecting paper laminates in their recycling program. There is definitely a division between the paper laminates and gable tops and aseptic collection.

Among Canadian jurisdictions only a handful of communities in the Maritimes accept paper laminates in their recycling program. The Province of PEI, as part of its Island Waste Management Corporation, allows paper cups and non recyclable paper products in the green bin. Moncton, NB has a wet/dry program which recycles paper laminates and two regional waste sheds in Nova Scotia are participating in a pilot project to incorporate Tim Horton coffee cups into the feedstock of a local paper mill. While the hot drink cup is not listed as a recyclable material in the promotion and education literature in the participating Nova Scotia programs, it is accepted in one of the Regional residential program along with hot drink cups from the Tim Horton pilot stores. The other region does not accept the hot drink cups in its residential program but Tim Horton's cups are processed at the local MRF through a private collection program.

With the exception of communities in West Coast Canada, all Canadian communities accept gable top and aseptic containers. Communities in British Columbia rely on the province's expanded deposit return program to collect the gable top and aseptic containers and do not permit the materials in the recycling programs. Otherwise, all large urban communities across Canada accept gable top cartons and aseptic containers in their curbside recycling programs.

Nova Scotia's Resource and Recovery Fund Board (RRFB) separately bales its gable top containers from its aseptic containers in order to get the best price. Currently, the aseptic bales are being collected from the MRF at $0/tonne and gable top bales are being collected at the MRF for $80/tonne. Both materials are marketed by Great Northern Recycler and sent overseas to the Asian market.

A handful of communities require that all caps and lids be removed from the containers prior to being placed in the recycling stream and some communities do not accept glass containers in their recycling programs. See Table 7 for details.

Table 9: Composite Paper Packaging Diversion Activities by Canadian Communities

		Paper Laminate					Gable Top		Aseptic		Other	
Packaging Materials: from Blue Box Steward Guidebook, March	**2006 census population**	**Hot Drink/Paper Cups**	**Fibre Cans (or spiral cardboard container)[1]**	**Ice Cream Cartons**	**Fibre Pot**	**Other: blister pkg granola wrapper**	**Milk Cartons**	**Juice Cartons**	**Juice Boxes**	**Soup Containers**	**No Glass**	**No caps on cartons**
Victoria, BC	78,000	no	no	no	not listed	not listed	no	no	no	no		
Nanaimo, BC	79,000	no	no	no	not listed	not listed	no	no	no	no	√	
Kelowna, BC	107,000	no	no	no	not listed	not listed	no	no	no	no	√	
Vancouver, BC	578,000	no	no	no	not listed	not listed	no	no	no	no		
Edmonton, AB	730,000	no	no	no	not listed	not listed	√	√	√	not listed		
Calgary AB	988,000	no	no	no	not listed	not listed	√	√	√	not listed		
Regina, SK	179,000	no	no	no	not listed	not listed	√	√	√	not listed		
Winnipeg, MB	633,000	no	no	no	not listed	not listed	√	√	√	not listed		
Brandon, MB	42,000	no	no	no	not listed	not listed	√	√	√	not listed	√	
Montreal, QC	1,621,000	no	no	no	not listed	not listed	√	√	√	not listed		
Sherbrooke, QC	147,000	no	no	no	not listed	not listed	√	√	√	not listed		
Saint John, NB	68,000	no	no	no	not listed	not listed	√	√	no	not listed	√	√
Fredricton, NB	51,000	no	no	no	not listed	not listed	√	√	√	not listed	√	
Moncton, NB	64,000	dry stream	dry stream	dry stream	not listed	not listed	√	√	√	not listed		
Halifax, NS	373,000	no	no	no	not listed	not listed	√	√	√	not listed		√
Charlottetown, PEI	32,000	green bin	no	green bin[2]	not listed	not listed	√	√	√	not listed		
St. John's, NFL	101,000	no	no	no	not listed	not listed	√	√	√	not listed	√	√

(1) spiral cardboard containers include: frozen juice cans, pringle potato chip container, powder cleaners, cookie dough packages, baby formula, hot chocolate/ice tea containers

(2) non recyclable paper products can be included in the green bin

4.2 US Jurisdictions

While most US cities collect gable top and aseptic containers, very few cities collect paper laminates in their recycling program. There is definitely a division between the paper laminates and gable tops and aseptic collection.

Out of eleven US cities researched, only the City of Seattle permits paper cups in the recycling program along with ice cream cartons. Boston has just introduced spiral cans in its recycling program but not paper cups or ice cream containers (not listed as accepted). San Francisco permits cups and ice cream cartons in the green bins, see Table 10.

Most US jurisdictions studied, permit gable top and aseptic containers in their recycling programs. The Carton Council has been established by carton manufacturers to increase the number of municipalities in the United States and Canada accepting gable top and aseptic cartons in their recycling programs.

Table 10: Diverting Paper Packaging by US Communities

	Paper Laminate [3]				Gable Top			Aseptic	
Definition from Blue Box Steward Guidebook, March 2010	Includes laminated paper packaging that is in majority paper (51% by weight) but has more than 15% by weight of non-paper. This includes metalized foil/paper/plastic laminants where paper represents the greatest percentage by weight. In the event that there are 2 or more components, 60% of packaging has to be paper for the material to be considered a paper laminant.				Includes polycoated cartons.			Includes polycoated and foilized boxes.	
Packaging Materials: from Blue Box Steward Guidebook, March 2010	**Hot Drink/Paper Cups**	**Fibre Cans (or spiral cardboard container)[1]**	**Ice Cream Cartons**		**Milk Cartons**	**Juice Cartons**		**Juice Boxes**	**Soup Containers**
Seatle, WA	√	not listed	√		√	√		√	√
Portland, OR	no	no	no		√	√		√	not listed
San Francisco, CA [2]	green bin	not listed	green bin		green bin	green bin		no	no
Los Angeles, CA	not listed	not listed	not listed		no	no		not listed	not listed
San Jose, CA	not listed	not listed	not listed		√	√		√	√
Chicago, IL	not listed	not listed	not listed		√	√		√	√
Boston, MA	not listed	√	not listed		√	√		√	√
New York, NY	no	not listed	no		√	√		√	√
Miami, FL	not listed	not listed	not listed		√	√		√	√
Boulder, CO	no	no	no		√	√		√	√
Austin, TX	no	no	no		no	no		no	no

(1) spiral cardboard containers include: frozen juice cans, pringle potato chip container, powder cleaners, cookie dough packages, baby formula, hot chocolate/ice tea containers

(2) packaging can only be included in the green bin

(3) many US programs offer more limited recycling opportunities compared with Canadian communities - Items classified as 'not listed' can assume to be non-recyclable

4.3 Recycling of Hot Drink Cups in Seattle, Washington

The City of Seattle is the only US jurisdiction collecting hot drink cups as part of its residential recycling program.

An article from the Seattle Times traces the recycling process for hot drink cups in the United States.[2] Within the US, coffee cups typically become part of a fiber stream called mixed paper at the MRF, one of the cheapest types of recycled paper that can include magazines, phone books and small amounts of office paper. Most U.S. mills that accept mixed paper will use no more than 10 percent, added to higher-quality fibers.

The article further states that China purchases almost half of recycled mixed paper collected in the U.S., according to Moore & Associates in Atlanta. China's state-of-the-art mills can take between 20 and 40 percent mixed paper and so far coffee cups have not been a problem in the mixed paper stream since there are so few collected through recycling programs.

Staff at the City of Seattle confirmed through an interview carried out for this study that residents are permitted to place hot drink cups and other coated paper products in the recycling stream. While the City does advertise in its residential recycling literature that hot drink cups can be recycled, it does not heavily promote that the other paper laminates can be recycled and requires that residents separate the various components of the spiral wounds before placing them in the recycling bin. The City prefers to use pictures instead of words to illustrate what can go in the recycling bin. It has started to show coffee cups turned up-side-down to show that they need to be empty of contents before being recycled.

The City has a single stream recycling program - collection and processing is carried out by an outside contractor. The residential recyclables are processed by Allied Waste (a division of Republic Waste) at its MRF. All gable top, aseptics, and paper laminates are co-mingled into a mixed paper bale and marketed overseas. Efforts to speak with the Allied Waste staff overseeing the marketing of the mixed paper bale resulted in a request to send an email with questions. No response has been received to date.

While the City of Seattle does not provide recycling services to the commercial sector, it has introduced legislation driving recycling activities in the quick service sector, which includes all coffee shops. Quick service establishments are required to have packaging that is recyclable or compostable. The City has examined promoting coffee cups that can be composted (e.g. eco-tainers with PLA) but determined that there was too much green-washing and confusion over the term compostable and decided to promote recycling instead. It appears that the cups were not fully degrading during tests at the City's composting facility.

The legislation requires that quick service establishments provide recycling programs available to the public and have back of the house recycling collection. This has forced all coffee shops to recycle coffee cups that are consumed on the premises. The recyclables are collected and sent to one of three processing facilities (MRFs) within the area – Allied Waste; Waste Management and Smurfit. The paper cups collected from commercial establishments and processed at the Allied Waste MRF are blended in with the City's residential mixed paper bale and marketed overseas.

[2] Source: Coffee-cup recycling brims with Obstacles. October 21, 2010. Seattle Times. (http://seattletimes.nwsource.com/html/businesstechnology/2012673308_coffeecups22.html)

5. Paper Laminate, Aseptic and Gable Top Steward Activities

Steward representatives for aseptics, gabletops and paper laminates were interviewed for this research project to identify efforts being made to increase recycling or diversion of their packaging and also identify end markets used to recycle the collected packaging. Information from these interviews, as well as a literature search on efforts to recycle hot drink cups and other polycoated containers is summarized below.

The Carton Council of Canada (CCC) is a newly formed industry association of carton packaging manufacturers and other stakeholders that is dedicated to promoting the environmental performance of paper-based food and beverage cartons. The Council objective is to improve carton collection and recycling programs across Canada.

Representatives from the Carton Council were interviewed as part of the research for this project. They provided information on collection of aseptics and gabletops in Ontario recycling programs as well as on recycling processes for aseptics and gable tops, including a list of mills in North America which recycle aseptics and gable tops. Some of these mills can also recycle hot drink cups or ice cream containers. All of the mills identified were contacted through this research study. The results of the interviews with the mills are summarized in Section 7, with interview notes in Appendix C.

Key points raised by the Carton Council include:

- There is a shortage globally of polycoat fibre;
- Aseptics, gabletops and some laminates are the best source of fibre in the residential stream;
- The recovered fibre from these containers is very high quality – long fibres and 80% brightness;
- This fibre can be used for writing paper (see later interview with Cascades, Breakeyville, Quebec which produces writing paper from gabletops, etc), but are generally used for tissue and toweling;
- Tissue demand is growing 1% to 3% per year
- The traditional supply for tissue mills from office paper and book stock is declining;
- Mills globally are “digging deeper” for supplies;
- Different mills can handle different feedstocks

TDL Group Corporation represents Tim Hortons, which operates numerous coffee shops throughout Ontario. Recycling of hot drink cups is often demanded by local residents, and some municipalities have added hot drink cups to their recycling or Green Bin programs, whereas others have not.

TDL has also embarked on a comprehensive commercial recycling program through different haulers in different parts of the province, as well as in other provinces.

In Ontario, Tim Hortons restaurants use a number of different recycling haulers (with a range of end markets) to service restaurants in different parts of the province. Haulers assured Tim Hortons that they could find markets for the hot drink cups at mills where they are not considered a contaminant. Each hauler must provide a letter confirming that the material collected is being recycled (or in some cases composted) and is not being landfilled. Some of the arrangements include:

- Brantford/Waterloo – Waste Management collects from Tim Hortons restaurants;
- London – a composting solution through Try Recycling;
- Wasteco collects from some restaurants and sends single sided poly to Fibrek (SFK) in West Virginia;
- Some of the hot drink cups are put into a mixed paper grade #3 and sent to Georgia Pacific in Green Bay to make tissue, napkins and trays – the liner is screened out at the end of the process;

arrangements are made through Harmon Recycling which procures all fibre supplies for Georgia Pacific;
- In Quebec, a test was carried out at a Cascades mill:
- Turtle Island collect in the Toronto area. Some of the material reportedly goes into a mixed grade #3 and is sent to SFK West Virginia;

Tim Horton has tested adding hot drink cup material in the manufacturing of roofing paper or cardboard boxes. In addition, researchers at the University of Winnipeg are working on generating biofuel from Tim Horton cups. [3]

The company also has conducted some pilots in adding paper cups to composting feedstock. The cups will eventually break down during the composting process but often take two passes through the treatment process as described below. Hamilton's composting facility currently processes hot drink cups as part of the residential green bin program of many of its municipal customers (including the City of Hamilton, Halton Region, and Simcoe County). The Region of Niagara no longer includes hot drink cups in their Green Bin program because of difficulty removing polycoat film from finished compost.

The following excerpt is taken from a study conducted by a master degree student at McMaster University in December 2009.[4]

> *Joel McCormick, the Manager of the Central Composting Facility in Hamilton agreed to an interview on coffee cups processing in the Hamilton system. He stated that the paper layer may degrade under the right conditions of the organics treatment. The plastic layer will not degrade in the treatment. Instead it will be sorted out at the 'hurricane system' stage of the organic waste processing. As the name implies this stage blows air into the pile of organics and plastics such as plastic bags or the coffee cup plastic lining are removed and sent to a landfill. In some cases the paper layer does not decompose in the organic waste collection, for example if there is not enough air or moisture around the cup. In these cases the cup flows through the entire process and ends up in the residuals pile which is collected through a screener that collects pieces that are too big, so called 'overs'. In many cases the residual pile is re-processed and according to Mr. McCormick the paper layer of the cup may degrade when it's passed through the second time. In other cases though the paper layer of the cup may not degrade and the entire cup is screened into the overs pile as a contaminant and is sent to landfill.*
>
> *Mr. McCormick stated that the volume of cups that are found in their process was combined in their audit with paper tissues and box boards. The preliminary results of the draft audit cite the combined volume of these materials to be under 2.1% of the total waste stream.*
>
> *In the interview Mr. McCormick stated that Hamilton's Central Composting Facility is able to accept plastic lined paper cups because the volume of cups arriving at the organics facility is low compared to the overall volume of organics.*

The article goes on to day that coffee cups are are pulled out of the stream at various stages, such as the hurricane and the screener stages, and sent to landfil[5]l.

Starbucks has been actively investigating opportunities to recycle its in-store coffee cups. Over the past couple of years, Starbucks has implemented pilot recycling programs in Toronto and New York City. The pilot program is called *Cup-to-Cup.* The coffee cups are collected by International Paper (headquartered in Memphis, Tenn) and sent to Mississippi River Pulp mill in Natchez, Mississippi. Mississippi River is the only pulp mill in the U.S. that has successfully recycled used cups into fiber suitable for producing new cups. The paper cups are pulped together, they are not blended with any other paper packaging so it is a

[3] Researchers find fuel in Tim's coffee cups. . Oct. 3 2010 CTV.ca News
[4] Source: Disposable Coffee Cup Waste Reduction Study. December 15, 2009. Prepared by Hanna Ziada, McMaster University
[5] ibid

pure stream. The fibre pulp is sent back to International Paper coated paperboard mill located in Texarkana, Texas, where they are combined with other feedstock materials, and processed into cupstock and sold back to Starbucks. The approach works if the cups are treated as a separate feedstock in the mill and are not combined with other paper packaging feedstock. The pilot results are encouraging and research is on-going. [6]

This year Starbucks will begin a pilot in Chicago and will send cups from its Chicago stores to Green Bay, Wis., where a Georgia-Pacific paper mill will turn them into Starbucks napkins.[7]

The Coalition for Resource Recovery (Global Green USA) has also embarked on a paper cup pilot at 7 Starbuck stores in NYC using paper cups with OCC as a feedstock in a cardboard mill. Two separate feedstocks (one with 50% paper cups and the other with 10% paper cups) were sent to two different cardboard mills. The feedstock with 50% paper cups resulted in increased pulping time, decreased yield, increased rejects and increased production energy requirements per ton. The 10% batch had clogging problems but excellent fibre separation. Both mills felt the paper cup feedstock was not a good fit for their mills. The organization worked with Pratt Industries on Staten Island, where some of the cups will be recycled, makes 100% recycled content pizza boxes out of old corrugated cardboard and mixed waste paper. The organization is also pursuing opportunities to provide hot drink cups as feedstock in tissue mills.[8]

[6] Starbucks and International Paper Demonstrate Viability of Recycling Used Cups into New cups. November 30, 2010. International Paper News Release.
[7] Starbucks expanding recycling program with coffee cups in Chicago. June 29, 2010. Chicago Tribune
[8] Coalition for Resource Recovery at www.thecorr.org

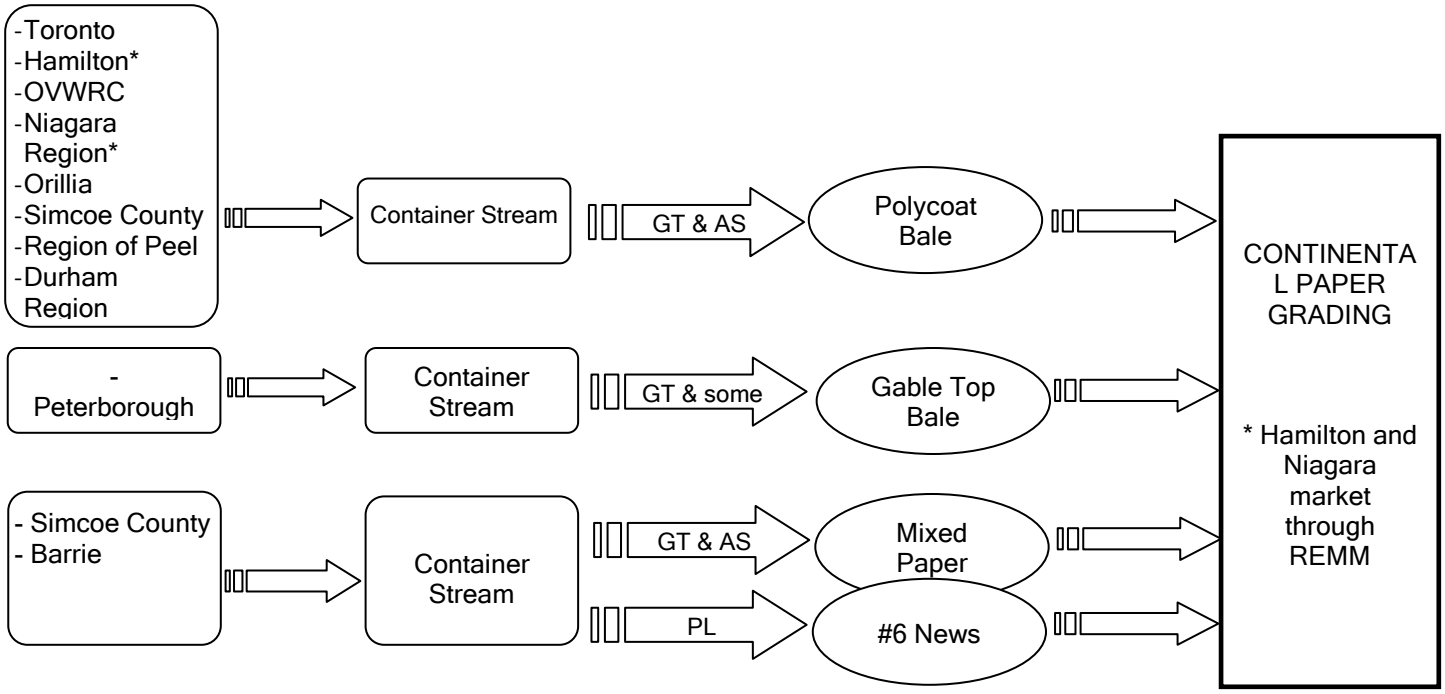
6. Paper Brokers and End Markets

6.1 Paper Brokers Used By Ontario Municipalities

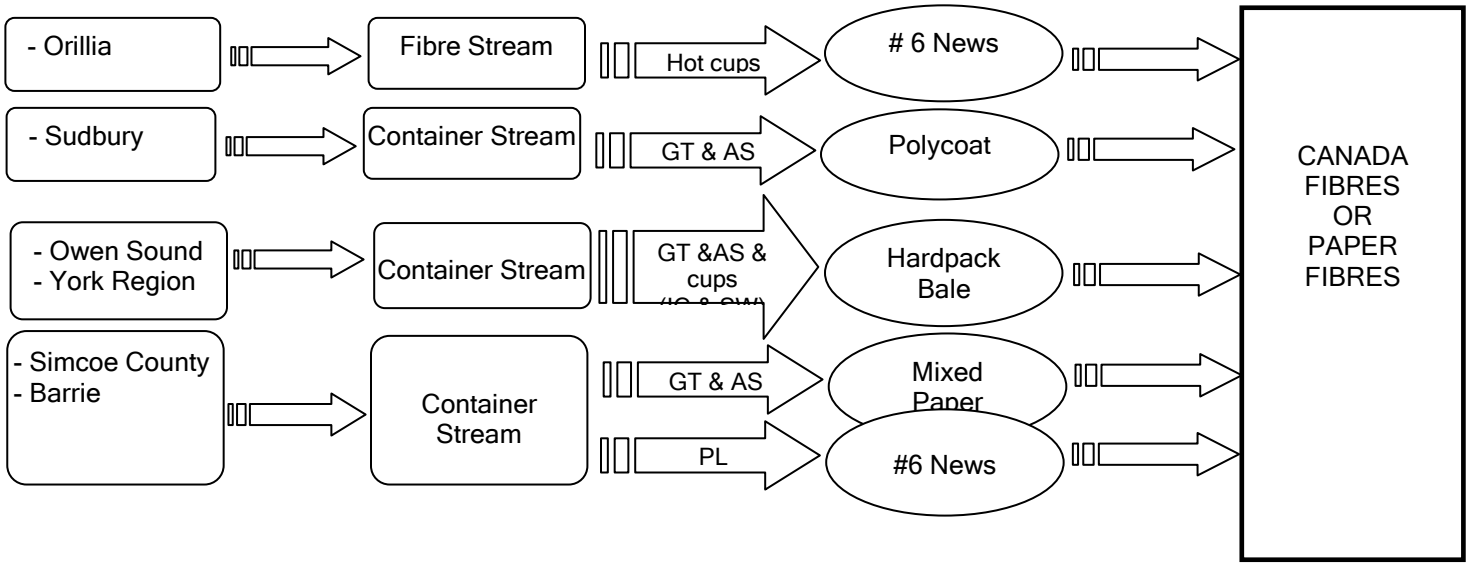
All surveyed Ontario municipalities have their baled gable top, aseptics and paper laminate materials marketed through a broker with majority dealing with Continental Paper Grading or Canada Fibres or Paper Fibres. REMM is also used by a handful of municipalities. Figure 4 show the flow of the materials to the brokers.

Figure 4: Ontario Brokers Marketing Paper Laminates, Gable Tops and Aseptic Containers

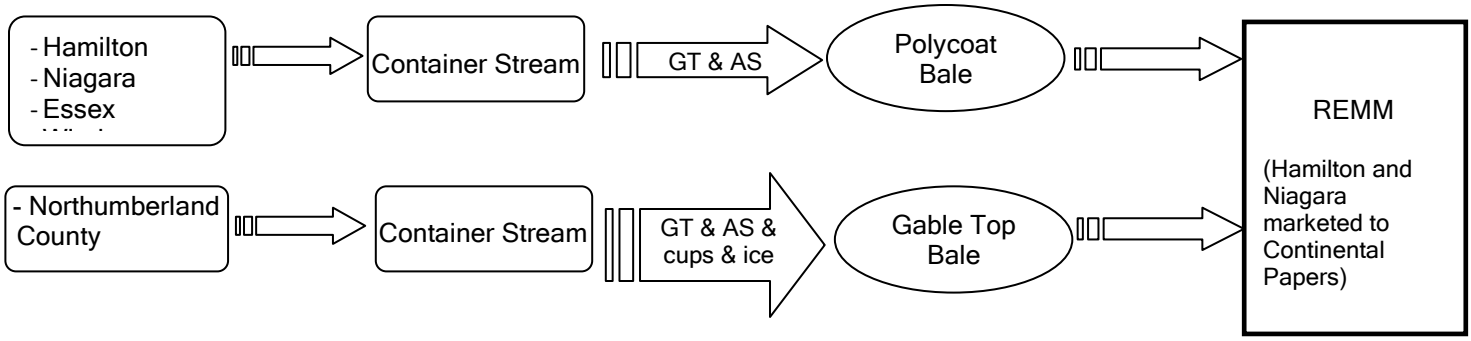
Broker - Continental Paper Grading



Broker – Canada Fibres and Paper Fibres



Broker - REMM



6.2 End Markets Used By Ontario Municipalities and Recyclers

A handful of municipalities deal with other brokers or directly with the mills including:

- The City of Peterborough sends its mixed paper bale, containing, paper cups, spiral wounds (very few) ice cream containers (very few), OBB and mixed paper, directly to Sonoco mill (located in Trenton and Brantford), which manufacturers liner board, medium/packaging papers and spiral wound cores. The City does not actively promote recycling of spiral wounds or ice cream containers so it receives very few spiral wounds and ice cream containers to matter.
- Quinte Waste Solutions markets its polycoat bales through Paper Tigers in Chicago which acts as a broker. The polycoat sends the polycoat bales to Great Lakes Tissue in Detroit.
- Essex Windsor markets its own hardpack on a spot market basis.

Miller Waste Systems, which has the recycling processing contract for Region of York, is responsible for marketing of the material and retains 90% of material revenues. Miller operates a number of MRFs and market about 170,000 tonnes per year of recyclables from their MRFs combined. They use a number of

brokers at different times including: Canada Fibres, Paper Fibres Inc and Royal Hong Cheng. Miller used to deal directly with mills in the past but now generally deal through brokers. Miller receives a letter from all companies in their recycling chain providing assurances that materials are being handled in an environmentally responsible manner. Gable tops and aseptics are marketed through Continental Paper Graders for example. Where they receive hot drink cups, they tend to be marketed with lower grade fibre bales such as #6 news, hardpack or fibre B.

While the majority of polycoat bales are being marketed overseas to South Korea, a few brokers are dealing directly with mills based in North America:

- The City of Sudbury markets its polycoat through Canada Fibres which is sent to SFK Pulp Recycling U S Inc. in Fairmont, West Virginia (now Fibrek);
- Quinte Waste Solutions markets its polycoat through Paper Tigers in Chicago which is sent to Great Lakes Tissue in Detroit.

6.3 Information Obtained From Paper Brokers and Paper Upgrading Companies

Paper brokers buy bales of fibres from Ontario MRFs and consolidate fibres from many sources to product amounts of interest to mills which required very large volumes on a daily basis. Brokers develop very long term relationships with mills and other brokers who do not want to deal with multiple players with relatively small volumes of paper to buy the large volumes of paper needed for their operations. Paper upgrading companies process and re-process materials from MRFs further to produce higher grades of paper of interest to specialized mills and markets.

A number of companies who are either paper brokers or who specialize in upgrading paper for various end markets were identified and most were contacted for this research project. These included:

- Continental Paper Grading (CPG);
- Metro Waste Paper (Cascades);
- REMM;
- Canada Fibres;
- Paper Fibres Inc ;
- Paper Tigers, Chicago;
- OGO Paper (Ottawa);
- Royal Hong Cheng and
- Durham Shred and Recycle.

Specific questions posed to these companies included:

- A general description of the type of business they are in;
- The amount of material they handle annually;
- The types of material they handle;
- If they handle aseptics, gable tops and laminates;
- End markets they use for gabletops, aseptics and paper laminates (in many cases, this information was confidential);
- Issues that end markets have raised regarding each material.

Comments from paper brokers and upgraders included:

- Most paper brokers and paper processors have been in the business a long time (Continental Paper Graders 26 years; Canada Fibres (formerly Consolidated Fibres, over 20 years, etc). Relationships in the industry are extremely important;
- Canada Fibres has 6 MRFs in Ontario. They recently opened a commercial MRF at Hwy# 401 and #400 – current capacity is 120,000 tonnes per year with potential to expand to 500,000 tonnes per year if market conditions are favourable;
- Continental Paper Graders handle about 1.2 million tonnes of paper per year. They do not do any processing themselves, but sometimes finance equipment additions at MRFs to upgrade fibres for particular end markets;
- Metro Waste Paper is now owned by Cascades, which has 29 mills in Quebec;
- Brokers sell to domestic mills mostly – some materials are sold to overseas markets. Best estimate is over 80% of the fibre handled is sold to local (North American) mills – less than 20% goes to overseas markets;
- Overseas markets were developed for many materials when the domestic market crashed in 2008 – these markets may or may not be sustainable in the long term;
- MRFs are increasingly dealing through brokers as single stream material is "the last thing that domestic mills want to deal with";
- One paper processor tends to put hot drink cups in lower grades of paper (#6 news; hardpack or Fibre B) in order not to contaminate higher grades (polycoat);
- One broker noted that hot drink cups sometimes end up in cardboard bales at the MRF; they are prohibitives or out-throws at some mills as people stuff food and other waste into the cups;
- The price of oil and transportation costs impact on the markets used for different fibres;
- Gable tops and aseptics are currently sold together in one bale mostly to South Korean/overseas mills as well as to some North American mills. There are limited markets for these materials (most mills wont touch them). Poly and fibres are recovered; fibre used for tissue and toweling – some is de-inked
- Mills who were interviewed (see next section) stated that they would be happy to process dedicated bales of hot drink cups. Paper processors indicated that dedicated bales are not yet being made for paper laminates (hot drink cups in particular).
- Paper laminates are typically sent to mills that typically buy "poly-SBS";
- Paper laminates, aseptics and gable tops are all hydro-pulped;
- RMC Quebec will eventually take these materials but one processor had been told not yet (March, 2011);
- Processors see plenty of hot drink cups in MRFs, particularly in single stream commercial collections;
- There is an increased interest in recycled content;
- Hot drink cups on their own go to toweling mills – any mill with de-poly can handle. Some brokers and mills handle pre-consumer –finding a market for post-consumer is more challenging;
- Poly from de-poly process is either burned or sent to poly- low grade markets;
- Ice-cream containers – some have one sided poly; some have 2-sided. Lids are a problem if they have hard plastic rim. It is not practical to pull lids off at the MRF – the lids need to be taken off before collection for these containers to be recycled. There are markets for this material if the lids are removed. Sizing/wet strength in ice-cream containers – this can be broken down by adding temperature and steam;
- Some processors throw ice cream containers in with gable-tops – no complaints so far;
- Mills can reject load if the quality is not suitable, or can "downgrade" the load – pay less because the quality was not good enough;
- Prohibitives are things that should not be in the fibre at all, e.g. plastic, aluminum, metal, etc.
- Out-throws are fibres which are not suitable (e.g. cardboard to a tissue mill);
- The Marketplace is already adapting and has adapted to changing fibre mix – this plus move to single stream recycling has fundamentally changed the approach to fibre processing. MRFs are getting bigger and faster and more expensive, with more equipment.

- One challenge for mills is sorting out newsprint (which used to be 55% of incoming stream) from a fibre stream where there is now more than 50% non-newsprint (45% newsprint). One company has invested $20 million so that #8 news can be produced from single stream;
- Chinese markets – do not clean the material, they simply use it all. For last ten years, Chinese market used to make products – now they make packaging also;
- Overseas markets have supported single stream material – horrible job to separate fibre from metals, plastics, etc
- Have not had many complaints about food contamination – people are good about rinsing out;
- Loose some fibre in hydro-pulping process – at a guess it might be 10% to 20%;
- If hot drink cups, gabletops, aseptics or ice cream containers are in a hardpack bale, they may not get pulped at the end market mill as a hydro-pulper is required to remove poly coating. Some Ontario programs send hardpack to Sonoco (Trenton and Brampton) or Norampac, Niagara Falls, New York (make corrugated medium).
- Linerboard mills need higher quality paper whereas corrugated medium mills can handle more contamination and darker colours – their issue is to find strong fibres;
- Hardpack is typically sent to medium mills – it is a cheaper source of fibre and still has the strength needed

7. Paper Mills Which Recycle Aseptics, Gable Tops or Paper Laminates

7.1 Paper Mill Interviews

Paper mills to which polycoat bales or aseptic bales were sent and that were reported or believed to recycle aseptics, gabletops and paper laminates were identified through interviews with municipal recycling processing staff representatives, paper brokers, paper processors and stewards. Preliminary interviews for the project indicated that there are about 20 mills globally that handle aseptics and gabletops:

- SFK (Fibrek) Fairmont, West Virginia;
- Great Lakes Tissue, Michigan;
- Tissue Technology, Green Bay, Wisconsin;
- Kimberley Clarke, Mexico
- GET, Mexico (new mill – scheduled to open March, 2011) and
- Mills in Thailand and South Korea (through brokers).

Additional mills that were reported to process paper laminates and combinations of aseptics and gabletops were also identified through the early project research. Each of these mills, or the buyers for these mills, were contacted by phone in February-March, 2011. In most cases it was possible to speak to a company representative. In a few cases, it has not been possible to make contact with the right person to date (5th April, 2011).

Mills where hardpack containing gabletops or paper laminates were sent were also contacted to explore the extent to which the containers were incorporated into new products.

Technical staff and fibre procurement staff associated with each mill were contacted and asked a series of questions:

- What materials does your mill product (e.g. tissue, toweling, mediumboard, linerboard, etc)
- What types of materials do you use as feedstock?
- What is the capacity of our mill - How many tonnes per year of feedstock do you need?
- What percentage of your feedstock is recycled material?
- Where do you source your feedstock from?
- Do you have de-inking capacity on site?
- Do you have a hydro-pulper on site?
- Do you process aseptics, gabletops, hot drink cups, icecream containers?
- Are there any concerns with these materials in your process? (ink, wax, poly-coating etc)
- Is your processing batch or continuous?
- What are typical pulping times for each of these materials?
- What residual materials are produced from using these materials?
- What is done with the residual materials?
- Do you have a sense of the relative fibre yields from each of these materials (e.g. if a tonne of each of these materials was pulped, how much useful fibre would be produced?
- Are any expansions planned
- Other comments

Table 11: Paper Mills Contacted For Research

Mill	Comments
Atlantic Packaging, Scarborough	Can process hot drink cups and gable tops in linerboard mill Do not want aseptics
PC Fibre Technology LLC, DePere ,Wisconsin	FDA approval for 40% food contact. Can handle any polycoated material. Will take all the hot drink cups they can get
Great Lakes Tissue Company Inc, Cheboyagan, Michigan	Privately owned – this is their only mill. Capacity 15,000 to 18,000 tonnes per year. Can take all the polycoated fibre they can get – looking to buy more and expand.
Cascades, Breakeyville, Quebec	Process pre-consumer and post consumer hot drink cups
SFK Pulp Recycling, Fairmont Virginia	Produces air dried recycled bleached kraft pulp (RBK) and primarily supply manufacturers of uncoated freesheet, commercial and away from home tissue and coated paper in the US[9]. No success in contacting to date Site visit planned for April-May, 2011
Minas Bay Pulp and Power, Hantsford, Nova Scotia	Linked to Scotia Recycling who collect from over Tim 100 Hortons stores in Maritimes. Have been testing options for cups at mill for last 1-2 years. Looks promising but information not public yet
Georgia Pacific, Green Bay, Wisconsin	Harmon used as agent (interview pending) Has run some tests and hot drink cups not found in residue, therefore they ended up in product. Has tested aseptics with mixed success. Concern with "sanitary" issues related to food residue. If volumes were sufficiently high, they would invest in equipment to address sanitary issues and prevent staff contact. Make tissue and toweling
Sonoco, Brantford and Trenton	Hardpack from Ontario programs goes to this mill Does not want any polycoat containers in bale as they have no capacity to process polycoat
Lake Utopia Paper, New Brunswick	Reported end market for hot drink cups from Westmorland Albert, New Brunswick. Mill uses virgin fibre and fibre from old corrugated containers. Does not accept gabletops, aseptics or paper laminates. Tried these materials and experienced problems

7.2 Key Points from Paper Mill Interviews

A range of opinion was expressed by different paper mills about the processing of aseptics, gable tops, hot drink cups and ice-cream containers. All of the mills contacted (except Sonoco) process at least some polycoat containers. Each mill has a preference with respect to how the materials are delivered (dedicated bales) and which containers they will process. For the most part, all of the mills contacted produce tissue and toweling. These materials need high quality fibre, which is present in the aseptics, gabletops, hot drink cups and ice-cream containers. Characteristics of the containers which complicate the processing operation include:

- The amount of polycoat lining, and whether the container has lining on one sides or both sides impacts on pulping time and fibre yield;
- Some mills can not handle aseptics because of the aluminum which degrades product quality in some cases;
- Wet strength is present in ice-cream containers, gabletops and hot drink cups – this is a mixed blessing for some mills – the wet strength provides strength but takes a longer pulping time to break down;
- De-inking is a high capital expense for a mill. Where pulp needs to be very white, dark coloured hot drink cups need to be de-inked as the ink is sprayed on the paper surface and is embedded in

[9] Paper Age SFK Pulp Extends Downtime in Quebec, 1st April, 2009

the fibres. Ink is sprayed on the polycoat layer in gabletop containers and is removed when the lining is removed in the hydro-pulper

Detailed notes from mill interviews are presented in Appendix C to this report.

8. Preliminary Conclusions

- Aseptics and gabletops are collected by most recycling programs in Ontario;
- Some paper laminates are collected by some recycling programs in Ontario – the level of access to recycling varies by container and by program;
- Typical end markets for these materials are tissue mills which have hydro-pulpers (some also have de-inking capability);
- Some paper laminates are collected in Green Bin programs (ice-cream containers and hot drink cups);
- Some Green Bin programs have stopped accepting paper laminates as the polycoat coating is difficult to remove from finished compost;
- Aseptics and gabletops are mostly marketed in polycoat or gabletop bales which go to a few mills in the US or to overseas markets in South Korea through paper brokers;
- Some mills in the US north East and Ontario/Quebec/Maritimes can accept gabletops but generally experience more challenges, or do not want to accept aseptic containers;
- Spiral wound containers generally end up in the steel bale and go to a steel market if the magnet at the MRF is strong enough to capture the spiral wound container;
- Icecream containers can be accepted by a number of paper markets if the lids with the hard plastic rim are removed;
- A number of markets can accept hot drink cups as a separate bale. They like hot drink cups because they pulp quickly (polycoated on one side only) and produce very strong fibre;
- The colour of the hot drink cup is an issue for some mills and not for others. Where mills have de-inking the colour of the cup is not an issue. If the cup is used in a containerboard application the colour is not an issue;
- End markets are available for all of these materials but are limited and have challenges;
- Creating the bales of materials that end markets can use is a challenge
- A number of market development opportunities were identified through the research (equipment to address “sanitary” issue; creating separate bales of specific materials, etc.).

Appendix A

List of Contacts

Interviews Regarding Municipal Programs

Rob Radunske, Acting Director, Region of Waterloo
Melanie Kawalec, Manager, City of Peterborough
Herb Lambacher, City of Peterborough MRF operator
Cameron Wright, Manager of Operations, Essex Windsor
David Semus, Manager of MRF operations, Essex Windsor
Chantel Mathieu, Manager of Solid Waste, City of Sudbury
Adam Watson, Recycling Coordinator, City of Hamilton
Navin Sharma, MRF Operations, City of Hamilton
Heather Roberts, Supervisor of Operations, City of Kingston
Rob Rennie, Region of Peel
Rick Clow, General Manager, Quinte Waste Solutions
David Metcalfe, Manager of Operations, Durham Region
Rob Cox, Operations Manager, Northumberland County
Karl Allen, Manager of MRF operations, Northumberland County
Sandy Coulter, Manager, City of Barrie
Mitch Edwards, BFI MRF Operator, processes Simcoe/Barrie fibres
Ludwig Villicoe, BFI MRF Operator at Muskoka MRF - processes Simcoe/Barrie containers (contracted but not interviewed)
Greg Preston, Manager, City of Orillia
Shelley Fishere, Mid Ontario Disposal, MRF operator for City of Orillia
Wilma Bureau, Collections, Simcoe County
Chris Wood, Waste Diversion Coordinator City of Ottawa
Dan Stone, Metro Waste, Operator of Ottawa MRF for City of Ottawa
Chris Hughes, Manager of Solid Waste, City of Owen Sound
Matt Roe, Miller, operates MRF for Owen Sound
Renee Dello, Senior Analyst, City of Toronto
Bonnie Ballam, Operations, City of Toronto
Sue McCrae, General Manager, Ottawa Valley Waste Recovery Centre
Phil Zigby, Marketing and Procurement, City of Guelph (contacted but not interviewed)
Dick Lilly, Strategic Policy Advisor, City of Seattle
John Caputo, Material Marketing Manager for Western Region, Republic, MRF processor for City of Seattle (contacted but not interviewed)
Jenna Alderson, operations, Westmorland-Albert Solid Waste Corporation, NB
Heather Myers, Disposal Manager, Island Waste Management Corporation, PEI
Ed Clark, Owner, Green Isle Environmental, operates PEI MRF
Wayne Teabeau, operations manager, Scotia Recycling, operator of MRF for Region 7 Nova Scotia
Bonnie Clemens, Valley Waste Resource Management, Region 5 Nova Scotia
Tevor Morine, operations manager, Scotia Recycling, operator of MRF for Region 5 Nova Scotia
Cindy Smith, Acting Manager, Resource Recovery Fund Board, Nova Scotia
Jerome Paris, Director of Operations, Resource Recovery Fund Board, Nova Scotia

Staff at Sarnia, London, Halton Region, North Bay were interviewed to confirm that the communities were not collecting paper laminates in their recycling programs.

Interviews Regarding Paper Processing, Marketing and End Markets

Contact Name	Organization
Elizabeth Comere	Tetrapak, US and Carton Council
Rocky Cooke	Lake Utopia Paper (Irving) Utopia NB
Natalie Du Sol	Sonoco Paper
Mike Ekkens	Great Lakes Tissue- Cheboygan Michigan
Irfhan Fancy	Harmon (contacted, not interviewed as of 5th April, 2011)
Jeff Fielkow	Tetrapak US
Ron Gordon	Region of York
Norm Kraft	Niagara Recycling
Russell Lemarande	Georgia Pacific, Green Bay Wisconsin
Rodney Libby	Miller Waste Systems
Dan Lantz	Metro Waste Paper/Cascades
Nanda	Atul Nanda REMM
Dave Nielson	Fibrek (formerly SFK) West Virginia (not successfully contacted as of 5th April, 2011
Fred Partridge	Metro Waste Paper/Cascades
Andy Pollock	Region of Niagara
Carol Patterson	TDL
Paul Piikkila	PC Fibre Technology, LLC
Robert Roy	Cascades Breakeaville Quebec plant
Donna Roberts	Atlantic Packaging
Sharon Rees	Irving Paper NB
Sneyd	Anny Sneyd at Canada Fibres
Scott Travers	Minas Bay Pulp and Power, Hansford NS
Pete Valeriote	Continental Paper Grading
Ron Vandenheuvel	PC Tissue Technology, Wisconsin
Jake Westerhof	Canada Fibres
Dwight Whynot	Scotia Recycling

Appendix B

Municipal Questionnaire

Ontario Composite Paper Packaging Research Study
Municipal Survey

Date:

Municipality:

Name:

Contact Information:

Paper Laminate definition – as defined by Blue Box Steward Guidebook, March 2010
Includes laminated paper packaging that is in majority paper (51% by weight) but has more than 15% by weight of non-paper. This includes metalized foil/paper/plastic laminants where paper represents the greatest percentage by weight. In the event that there are 2 or more components, 60% of packaging has to be paper for the material to be considered a paper laminant.
Examples:

- **Paper Cups** – hot drink paper cups
- **Spiral cardboard containers** (also called **spiral wound**, fibre cans) include: frozen juice cans, pringle potato chip container, powder cleaners, cookie dough packages, baby formula, hot chocolate/ice tea containers
- **Ice cream containers**

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1. Confirm materials (aseptic, gable top and paper laminate packaging) collected?

   Gable Top ☐ Aseptic containers ☐ Paper Laminate ☐

2. Which paper laminate packaging do you collect?

   Paper cups ☐ spiral rounds ☐ ice cream ☐ other ☐ list

3. How do you define paper laminate? Are packaging materials different from above list.

4. Confirm recycling stream for gable top and aseptic.

   Gable Tops - Recycling Single Stream ☐ Container Stream ☐ Fibre Stream ☐

   Aseptic - Recycling Single Stream ☐ Container Stream ☐ Fibre Stream ☐

5. Confirm streams for paper laminates.

Paper Laminate - Recycling Stream ☐ Green Bin Stream ☐ Why green bin?

Paper Laminate - Recycling Single Stream ☐ Container Stream ☐ Fibre Stream ☐

6. How long have you been collecting the materials?

Gable Top		Aseptic Containers		Paper Laminate	
Less than 6 months	☐	Less than 6 months	☐	Less than 6 months	☐
Less than 1 year	☐	Less than 1 year	☐	Less than 1 year	☐
1-2 years	☐	1-2 years	☐	1-2 years	☐
more than 2 yrs	☐	more than 2 yrs	☐	more than 2 yrs	☐
# years		# years		# years	

7. What were the drivers in the initial decision to collect the materials?

8. Do you plan to continue collecting the paper laminate? Do you plan to add new paper laminate materials?

Processing Materials at the MRF

Does the municipality own the MRF? YES ☐ NO ☐

If yes, continue
If no, MRF contact information:

1. How are the three materials processed at the MRF?

2. Which bales do each of the three materials end up in?

Gable Top	Aseptic Containers	Paper Laminate
Separate ☐ Polycoat ☐ Mixed Paper ☐ Hardpack ☐ Other: Name: __ _____ Mixed with Aseptic containers: Yes ☐ No ☐ Mixed with Paper Laminate: Yes ☐ No ☐	Separate ☐ Polycoat ☐ Mixed Paper ☐ Hardpack ☐ Other ☐ Name: __ _____ Mixed with Gable Top: Yes ☐ No ☐ Mixed with Paper Laminate: Yes ☐ No ☐	Separate ☐ Hardpack ☐ Mixed Paper ☐ Polycoat ☐ Other ☐ Name: _ _____ Mixed with Aseptic containers: Yes ☐ No ☐ Mixed with Gable Top: Yes ☐ No ☐

3. Why can't paper laminates be added to the gable top or aseptic streams?

4. Where do you send them? (collect the contact information for Task 7)

5. Have you encountered any collection, processing or end market challenges and how did you address them?

6. How consistent are the markets?

7. Suggestions on how to improve the recycling of all three materials, paper laminates in particular?

8. Are you aware of any new innovations in technology or end markets for the paper laminates?

9. Other comments or relevant information

Appendix C

Notes from Mill Interviews

Cascades, Breakeyville, Quebec (near Quebec City)

- Cascades has 29 mills in Quebec.
- The Breakleyville mill is a de-ink pulp mill that makes fine paper (Rolands Fine paper is one product, also fax heading paper) and some tissue
- Batch pulping - makes SBS (solid bleach sulphate) at the mill
- Buys 90,000 tonnes/year of paper including different white grade printer waste (post industrial from printers) , ledger, etc.
- Buys different grades from different customers
- 70% of feedstock comes from Ontario and Quebec; 30% from US (Pennsylvania, etc)
- There is a hydropulper and de-inking capability at the Breakeyville mill
- Furnish is bought baled
- Buy pre-consumer Tim Hortons cups and like the material – pulps well; produces very good fibre – long white fibres; colour not an issue as they have de-inking
- Ice-cream containers are a good feedstock – the bottom is double sided.
- Material accepted at the mill can only by 10% to 15% double poly-coated
- The mill accepts gabletop and one sided poly – otherwise it will take too long to pulp
- Regular one-sided poly material is good – it is de-inked and pulped
- The mill accepts post-consumer cups if they are baled. It needs a certain % of post-consumer cups to meet FSC (Forest Stewardship Council) credits. The mill needs to know the % of post-consumer cups in the bale to track if they are meeting FSC requirements for post-consumer content;
- Yield from hot drink cups is pretty high – about 30% of the polycoat bale is lost (plastic and other contaminants).

Minas Bay Pulp and Power and CKF, Hansford, Nova Scotia

- Minas Bay is Canada's first 100% post-consumer mill – started in 1950's and 1960's looking for pulp substitutes;
- Own Scotia Recycling which collects from 100 Tim Hortons stores and want to continue to add locations;
- Scotia Recycling used to send aseptics to Michigan but the market has not accepted them for months. Now ship gabletop and tetrapak out of Halifax Harbour – the Korean market is the most accessible
- Minas Bay is a linerboard mill – some linerboard mills make linerboard from kraft pulp, others use recycled feedstock and some use a combination of both. They use 100% recycled feedstock;
- Source 90,000 tonnes/year of OCC, brewery stock and other fibre (mixed grade office, cereal box/boxboard, etc);
- CKF (Canada Keyes Fibre) is a sister mill across the street in Hansford – make mounded pulp products – egg cartons, chinette plates and carrier stock (take out trays for food, drinks etc); CKF have numerous mills across Canada including in Ontario, BC and Nova Scotia;
- The company has been testing Tim Hortons as a feedstock for the last 1-2 years– so far the trials look good, but no information has been made public to date – they hope to have more information in Spring, 2011.

Atlantic Packaging, Scarborough, Ontario

- Atlantic Packaging have 5 mills in the GTA area (2 Scarborough; 1 Mississauga; 1 Brampton) and one in Ingersol, Ontario;
- Make corrugated boxes which are used by customers in Southern Ontario;
- Two mills in Scarborough – both linerboard and medium – capacity 500,000 tonnes/year;
- Atlantic needs 2,000 tonnes/day for his mills; within the GTA they have their own trucks and customers to provide paper supply;
- Ship a lot to Quebec, get some fibre from Detroit (cheap back-haul);
- Tissue division was sold to Cascades – had 2 batch pulpers which are good for running tests;
- Has done a lot of work on gabletop and aseptic recycling in tissue division;
- Can handle gabletop but not aseptic in his mills
- Gabletop pulps well, exceptional for re-pulping
- Develops pulping recipe in lab, then do pulping trials with a few bales to see how materials work in their mills; needs 10 tonnes of a material to do a full test;
- Did a lot of work on hot drink cups at his tissue division. Hot drink cups have two different liners – starch base and poly liner. Tested loads supplied by manufacturers – completed pulpability and batch pulpability testing - worked well in his tissue mills –tissue is best value added product
- Hot drink cups produce good quality fibre, they were able to do batch processing with high recovery. Can also use hot drink cups in cardboard mill on liner side of operation – the brown sleeves are not a problem for the linerboard operations; too much food contamination is a problem; foil wraps are also a problem contaminant;
- No de-inking at facilities – dissolvable ink is removed in the washing process;
- Wax – problem with wax is that it has the same density as water – it melts and soaks into the fibres, creating a paper with big black ugly specks which are visible, destroying the paper run;
- Did not test ice cream containers or freezer boxes;
- Atlantic used to have a newsprint mill in Whitby which was closed down as newsprint market is declining. Hot drink cups are a "death stroke" for newsprint mills. The cup does not break down so mill pays twice – when they buy recycled feedstock and when they pay for landfilling of residue.
- Atlantic Packaging also recycle cardboard boxes. Hot drink cups work in this application also. Continuous pulpers – it takes more effort to break down cardboard boxes – if hot drink cups in the mix, they eventually break down. Ink and plastic are not an issue for corrugated mills
- Do not want waxed or aseptic packages – foil is a problem for his mills – creates small specs of aluminum on his product

Irving Paper, New Brunswick

The Westmorland-Albert recycling program indicated that hot drink cups were sent to the Irving paper mill. Irving have four facilities in New Brunswick. One facility was contacted (Lake Utopia Paper). It does not accept hot drink cups. The remaining three mills are all in St John (Irving Tissue, Irving Pulp and Paper, and Irving Paper) were not contacted as sufficient information was provided from other end market contacts to answer the questions of interest to the study. Key information from Lake Utopia Paper:

- Mill uses virgin fibre from mixed hardwood and fibre from old corrugated containers (blended stock, 65% hardwood, 30% secondary)
- Makes corrugating medium which is used for packaging
- 75% of raw materials come from New England, remainder from Atlantic Canada
- Use 70,000 tonnes/year, number has stayed same over the last few years
- Does not accept gable top, aseptic or paper laminates – they have tried cups over the years and they do not work at this mill as a feedstock
- Materials go through secondary fibre system.

- Mill has experienced problems with processing loads containing aseptics, gable tops and/or paper laminates and refuse to receive these materials
- Wax coating causes problems on their paper machine – the temperature of pulper melts wax – it gets stuck on fibres and creates holes

PC Fibre Technology LLC, DePere, Wisconsin

- PC Fibre Technology LLC has a pulp mill in Green Bay, Wisconsin which they have owned since 1999 as a different company (Ecofibre). In the past it used SOP (sorted office paper) to produce high tech printing paper. In 2009/2010 new patents were developed – it now operates Green Box. The company has one operating facility and is developing 11 more units across the US. There is a brand new facility in Detroit which can take 250 tons/day – can take anything polycoated
- The process has been refined to take away any polycoat – the mill will take all the hot drink cups they can get, even with food. They can process ice-cream cartons, milk cartons, any polycoat cups.
- The pulp is used to make paper tissue
- There is de-inking capacity on the site
- The facility is the only one in the US which is FDA approved for application to food service – napkins, plates or cups from the facility are approved for 40% food contact
- The facility is zero discharge, no waste goes to landfill and all water is reused
- Poly plastic is turned into a fuel pellet, which is sold as a coal replacement to power generation facilities in Wisconsin. Sludge from the operation also goes into fuel pellets which have a consistent BTU value of 10,500 to 14,000 BTU per lb. Aluminum from aseptics is recovered from the bottom of the pyrolysis unit and is sold to aluminum markets
- All material is pulped together in batch mode with different batch times depending on the material mix being pulped. The amount of aseptics may cause the batch pulping time to be longer – aseptics increase the pulping time for this particular operation from 23 to 31 minutes- a longer pulping time is required if there are more aseptics in the load. Gabletops are the best for this operation- pulp time is 18 to 20 minutes
- The operation does not use a lot of chemicals, no steam is used as the system runs cold – staff were reluctant to share technical details as it is a patented system
- Ice-cream containers – they will test and put to an appropriate application. Wet strength is good when making napkins
- They estimate they get about 50% fibre from 1 tonne of hot drink cups – all of the fibre goes into tissue; poly is used as fuel.

Great Lakes Tissue Company Inc., Cheboygan, Michigan

- Great Lakes Tissue is a privately owned company. The Cheboygan facility is their only mill. It makes 9 lb and 15 lb tissue which is turned into toilet paper and tissue. The make large parent roles which can be sub-divided into small roles, hand towels, napkins, etc. The large jumbo roles are sold to six converters – they sub-divide further. Products are made for some private label companies (e.g. "Priceless" brand). All finished products are sold into the market through wholesalers
- The mill uses 100% recycled stock – 15,000 to 18,000 tonnes per year. All of their recycled stock is sourced in North America now – they are looking to buy more. They have one paper machine now and would like to double their capacity
- He will take all he can get of any polycoated fibre – trimmings, cups/paper plates. He takes hot drink cups and cold – loves Tim Hortons cups

- Cant take wax which is a disaster for his paper machine. He can tell if there is wax coating on a container by the feel of the product – if you scrape the surface you get wax. The paper machine looks like a candle if wax gets into the feedstock – the processing temperature melts the wax and it coats the machine – it takes about 2 days to clean everything after a wax problem.
- The pulper has a series of cleaners to remove poly – this is shipped to burn which is best option. People have tried plastic lumber and other end uses with less success. Aluminum from aseptics goes with the poly
- From 1 tonne of polycoated products the miss gets about 65% fibre – some fibre is lost in the process
- He loves Tim Hortons cups because of the high fibre yield. His yield increases to 65% with the cups, also he likes the long fibres which increase tensile strength. There is no de-inking capacity at the mill, so he can only take small amounts of the cups at a time. A significant % would turn the pulp red but smaller amounts are acceptable
- He can handle ice cream containers
- Inks can be a challenge - In some containers UV type inks will fractionate – this causes problems on the paper machines. Sometimes containers have triple and quadruple print – this puts a lot of inks into his system - he likes to run samples before he accepts loads
- He needs different pulping times for different materials - the pulping time depends on how the material is "beating up" – the mill needs to get the overall blend right
- Wet strength –this is present in some containers with the addition of a chemical that bonds fibres so they don't break down easily or quickly in water – it just takes time. It is not easy for him to break down wet strength – sometimes this results in poor yield

Georgia Pacific Mill, Green Bay, Wisconsin

- Georgia Pacific has several mills in the US, The 3 main recycle mills are Green Bay, Savannah River and Micovie, Oklahoma. – each produce over 1,000 tonnes/day, so 3,000 tonnes/day overall. Georgia Pacific make tissue, towelling and napkins at recycle mills
- They do have de-inking and pulping on site – does not want to get into details for business reasons
- They use office papers, curbside collections, printers mix from all over US/North America
- Much of production is "ecologic" – people don't want bleach, so they are OK with brown napkins
- They have used gable top and aseptic – not always with good results.
- There is a "sanitary" issue with aseptics- people leave drinks at the bottom, this causes odours and "wildlife" which is a problem with staff at the mill. They want to reduce employee contact with any materials that have residual food. The equipment to do this is not in place now. If they were handling a bigger volume he would set up equipment to handle these containers in a way that avoided employee contact. Do we have enough material to justify the investment?
- They have run aseptic pre and post-consumer. Pre-consumer – a lot of loss, a lot of layers to get through
- He can handle cold cups with double sided poly, hot drink cups.
- It costs a lot to buy pre-consumer cups as they are good quality
- Post-consumer, issue is clean collection. He did receive a sample with some Tim Hortons cups, most of the sample was cardboard boxes, etc.
- Tim Hortons has not yet sent cups to Green Bay. He needs to test samples before he accepts a material. It is best to work through Harmon Group which sources all his materials –Harmon will arrange to get samples
- Recovery – depends on what is mixed up with what – they optimize the process to make the greatest use of the largest part of the mix
- Wet strength resin – if you mix this up with other materials – one or other gets lost
- Ice-cream containers – again, milk products are smelly if not rinsed properly. Acceptable if pre-consumer

- Mixed paper #3 is "anything" – some cups, OCC, ONP, OMG, all dark colours, probably makes towelling or unbleached napkins. He did not find cups in out-throws when he ran the bale that contained hot drink cups so they must have been incorporated into the product.