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PLASTIC BAGS, DIAPERS AND PET WASTE IN SOURCE SEPARATED ORGANICS

The Solid Waste Management Committee recommends that Council adopt the recommendations contained in the following report, November 25, 2008, from the Commissioner of Environmental Services and the following additional recommendations:

- 3. Council endorse the elimination of non-biodegradable plastic bags in the Region's source separated organics program and staff provide a report on strategies and timelines for the elimination of non-biodegradable plastic bags in the Region's source separated organics program.**
- 4. Staff report back in the next two months with options for a pilot project related to the elimination of non-biodegradable plastic bags in the Region's source separated organics program.**

1. RECOMMENDATIONS

It is recommended that:

1. Staff be directed to work with local municipalities to promote the voluntary use of biodegradable bags as an alternative to plastic in the source separated organics program.
2. Staff be directed to continue the source separated organics program and assess the effect that the voluntary adoption of biodegradable bags has on source separated organics processing.

2. PURPOSE

This report examines alternatives to the current practice of using plastic bags for Green Bin liners and the inclusion of diapers, sanitary products and pet waste in the Source Separated Organics (SSO) waste stream.

3. BACKGROUND

York has run Source Separated Organics programs since 2005

The York Region Source Separated Organics program started in late 2005 with material collected in Markham. The program then expanded in November 2006 with implementation of the Green Bin in Vaughan, followed in May 2007 by Richmond Hill

and in September 2007 with commencement of programs serving King, Newmarket, East Gwillimbury, Georgina, Aurora and Whitchurch-Stouffville. The Region wide SSO program has run for over a year and results in curbside collection of about 86,000 tonnes per year of organic wastes with a current estimated residual content, in the order of 15%. These residuals are composed mainly of plastic film.

During the first two years of operation processing challenges negatively affected SSO residual rates. Persistent odour problems with Halton Recycling caused the Region to cease using this Newmarket based processing company and switch to a Quebec based processor, GSI Environnement. GSI Environnement subsequently experienced processing difficulties in Quebec, attempted to set up a process facility in Michigan and ended up landfilling source separated organics material. In June 2007, Orgaworld, a Netherlands based company, started operations in London and, despite some early odour issues, runs a process that manages about 35% of York's SSO. A similar process run by Conporec Inc. at Bécancour Quebec started in November 2007. To date, Conporec has not been able to accept the volume of waste anticipated at this facility. In October 2008, Universal Resource Recovery started operations in Welland, Ontario and currently receives about 40% of York's SSO materials. Table 1 summarizes York's current SSO operational contracts.

Table 1
York Region SSO Contracts

SSO Service Provider	Material Processed Annually	Contract Term Ending
Orgaworld Canada Ltd. London, Ontario	30,000 tonnes currently + 30,000 tonnes (starting January 2009 with 42,000 tonnes put or pay)	June 26, 2017
Universal Resource Recovery Inc. Welland, Ontario	50,000 tonnes (with 25,000 tonnes put or pay)	January 23, 2011
Conporec Inc. Bécancour, Quebec	Up to 39,000 tonnes (with no put or pay minimum)	August 2, 2010 Contract under review

Use of plastic bags in York's SSO program increases residue but also contributes to higher than average participation rates and protection of worker health and safety

To encourage early public acceptance and participation in the Source Separated Organics program and to facilitate collection of as much of the organics stream as possible, York elected to allow the use of plastic bags in the program. Residents across the Region have

responded positively to this approach, diverting about 21.5% (2008 Total Waste Estimated at 337,134 tonnes, SSO estimated at 85,364 tonnes including residuals) of the total waste stream through the SSO program net of residuals.

Plastic bags, however, present issues with processing, directly contributing to high residual rates. The bags themselves are only a minor contribution to the residual material quantity, but the presence of the bags prevents other organic materials from composting completely and consequently results in disposal of unacceptable materials with organics. Early process audits report residual rates approaching 20% due largely to non-composted materials including diapers and organic materials in small bags within other bags. Surveys of SSO composition found, on a weight basis, 13% diapers and sanitary products; 2% pet waste and 2% plastic bags. Recent technology improvements have reduced residual rates to 15%.

Diapers contribute to residuals because residents normally wrap them up into tight balls to minimize odours. The size and shape of the resulting diaper ball prevents them from effectively breaking down and digesting in normal aerobic systems. Pet wastes frequently get double bagged in small bags that pass right through the process without digestion.

Because diapers, pet wastes and sanitary products are collected in the program along with kitchen organics, significant health and safety concerns exist because of the presence of pathogenic bacteria in these wastes. Plastic bags help to minimize resident contact with organic waste. York has advised curbside collectors and SSO contractors of the need to have adequate worker protection.

SSO processors responded to high residue rates with improved technology to remove bags

In August 2008, Orgaworld installed an improved final screening unit that included bag ripping tines and internal baffles that more aggressively turned the waste. This process shredded bags remaining after the composting process and encouraged separation of organics from plastic film. Uncomposted organic material recovered in the final screening process gets returned to the composting tunnels for re-composting. Tests on the new process indicate residual rates have dropped to below 15%.

The Universal Resource Recovery system involves front-end processing incorporating wood amendment that serves as a bulking agent. Their system involves continuous treatment of SSO materials for a 28 day period with daily turning and moisture adjustment to optimize oxygen content, break bags and optimize composting. Universal Resource Recovery estimates residuals in the 15% range.

4. ANALYSIS AND OPTIONS

York staff contacted local municipal waste coordinators to solicit input on the sensitivity of the Source Separated Organics program to the inclusion of diapers, sanitary products and pet waste in the program. Input was also sought on changing to a program based on biodegradable bags. Staff also contacted their counterparts in surrounding municipalities to explore their programs and seek opinions on various program options.

Local Municipalities prefer program with plastic bags, diapers and pet wastes

All of the nine local municipalities responded and all of them emphasized the importance of retaining some kind of plastic bag in the program. All of them felt that the underlying success of York's program resulted from the inclusion of plastic bags. They believe this offers a distinct advantage in allowing residents to use their green bins without handling objectionable organic materials. They felt that any mandatory change to the plastic bag rule would result in significant decline in resident participation.

Response varied to the idea of moving to biodegradable bags only. In general, most local municipalities support the idea of encouraging residents to use biodegradable bags and indicated a willingness to support a public communications program promoting this option. Most local municipalities suggested that residents would resist purchasing biodegradable bags at 7¢ per bag for the kitchen unit and 20¢ per bag for green bin liners and many expressed concern about the durability of the bags during the summer.

All municipalities wished to retain the diapers, pet waste and sanitary products in the SSO waste stream because these materials represent a considerable quantity of the materials recovered by weight and inclusion encourages participation in the program.

Other Regional and County programs require certified biodegradable bags and exclude pet waste and diapers

With the exception of the City of Toronto, most municipal SSO programs across Ontario do not include diapers, pet waste or sanitary products. These materials contain biological pathogens and result in health and safety complaints from processor's and collector's staff. The Province of Ontario has not issued any guidelines restricting materials collected in municipal Source Separated Organics programs. Table 2 summarizes other SSO programs in surrounding municipalities.

Table 2
Other Municipal SSO Program Requirements

Municipality	Container Requirements	Materials Included
Halton Region	Biodegradable plastic bags only	No diapers, pet waste, sanitary products
Durham Region	Biodegradable plastic bags only	No diapers, pet waste, sanitary products
Peel Region	Biodegradable plastic or paper bags only	No diapers, pet waste, sanitary products
County of Simcoe	Biodegradable plastic or paper bags only	No diapers, pet waste, sanitary products
City of Barrie	No bags, paper bags, biodegradable bags only	No diapers, pet waste, sanitary products
County of Durham	Paper bags, will allow biodegradable plastic	No diapers, pet waste, sanitary products
City of Toronto	Plastic Bags	Includes diapers, pet waste and sanitary products

At the AMRC Convention in October, Halton Region reported a rate of \$70 per tonne for a Source Separated Organics program based on biodegradable plastic bags that does not include diapers, plastic bags and pet wastes and reports an overall participation rate of 73% with a 13% residual. Assuming similar waste production rates in York and Halton, Halton's Source Separated Organics program represents a curbside diversion of about 16% of their total waste stream. York projects diversion of 21.5% of waste through our SSO program.

Short-term program should retain plastic with longer-term goal to reduce plastic content through promotion and education

Local municipalities will not likely support a mandated change to biodegradable bags but most will support a public education program encouraging their use. Education programs could include distribution of suitable bags with information about their environmental benefit printed on the bag in suitable vegetable-based ink. If 50% of residents use biodegradable plastic bags, it is expected that SSO process residues will drop by 3% to 5%.

Education could also target retailers encouraging them to adopt approved biodegradable plastic bags as alternatives to their current bags and to promote displays of biodegradable kitchen waste bags in their store. Distribution of biodegradable bags, particularly by grocery stores would significantly reduce SSO process residuals.

5. FINANCIAL IMPLICATIONS

Additional program costs result in up to 8% additional capture of material

York Region currently pays between \$114 and \$125 per tonne for transportation and processing of Source Separated Organics materials (assuming \$1.00 per litre for fuel). Quebec based processing costs have gone as high as \$144 per tonne. Changing York's SSO programs by eliminating plastic bags, diapers, sanitary wastes and pet waste would reduce the cost per processed tonne to \$122. Elimination of plastic bags, diapers, pet waste and sanitary products would reduce participation by an estimated 10%; result in a 2.4% lower diversion rate and reduce program costs by 21.5%.

Source Separated Organics costs exceed the cost of disposal and waste processing options

York Region pays an average of \$94 per tonne for transfer and processing of residual waste at the Dongara facility. Transportation and disposal at the Green Lane landfill currently costs \$60 at average 2008 fuel prices. Source Separated Organics processing costs exceed disposal costs by about 35%, but, as diversion, represents a sustainable solution to waste management challenges and realizes associated environmental benefits.

Table 3 shows estimated savings based on the assumption of a residual of 15% consistent with our most recent process audit and estimated decreases in residual corresponding to various options.

York Region's local municipalities have expressed reservations about the potential negative impact that mandatory changes to the source separated organics program might have on public participation rates. There is concern that residents may resist the extra expenditures associated with using biodegradable bags and further, that those who choose not to purchase these bags may abandon the program entirely rather than deal with handling objectionable materials. No data currently exists to quantify these potential impacts. As a rough sensitivity analysis for the scenario of mandatory use of biodegradable bags, along with elimination of diapers, sanitary products and pet waste shown in Table 3, if even 10% of residents were to choose to no longer participate in the program, the forecast contribution to diversion would drop to roughly 19%.

Table 3
Estimated Impact of SSO Program Changes

SSO Program Option	Curbside Collected (tonnes)	SSO Diversion (tonnes)	Estimated Residual	SSO Contribution to Diversion	Total Program Cost	Estimated Cost per diverted tonne
Existing program ¹ with diapers, sanitary products, pet waste and plastic bags (estimated 15% residual)	85,364	72,590	15%	21.5%	\$10,004,354	\$137.82
Voluntary biodegradable bag program (estimated 3% less residual than existing)	85,364	75,150	12%	22.3%	\$10,004,354	\$133.13
Recommended						
Mandatory ² biodegradable bag program (estimated 6% less than existing residual)	76,830	69,900	9%	20.7%	\$9,004,200	\$128.82
Mandatory ^{2,3} biodegradable bag and elimination of diapers, sanitary products and pet waste (reduces SSO at curb by 13%; 15% less residual)	67,000	64,300	4%	19.1%	\$7,852,159	\$122.12

- Notes:
1. Current program collects 85,400 tonnes of SSO + Residual at a weighted average cost of \$117.21 per tonne
 2. 10 % decrease in participation considered in calculations because of mandatory biodegradable bag requirement.
 3. Organic processes will produce a minimum of 4 % residual

6. LOCAL MUNICIPAL IMPACT

Local municipalities have based their long term waste collection contracts on collection of organics in plastic bags and the collection of diapers, pet waste and sanitary products as part of the program. Local municipal staff unanimously stated that existing high participation rates result from ease of use afforded by plastic bags and felt that curbside participation would decrease if more expensive biodegradable plastic bags became

mandatory. Decreased curbside participation would represent a decline in the municipal effectiveness measure "Diversion of Residential Waste".

7. CONCLUSION

York Region's local municipalities wish to continue with the existing Source Separated Organics program that includes collection of household organics, diapers, pet waste and sanitary products in a plastic bag based system. In 2009, York staff will develop promotional and educational programs encouraging residents to switch to a biodegradable bag as a more sustainable solution. Promotion and education will also encourage retailers to switch from their current plastic bags to a more sustainable biodegradable option. Staff will subsequently re-assess the source separated organics processing program to determine the effect that voluntary adoption of biodegradable bags may have.

For more information on this report, please contact Laura McDowell, Director Environmental Promotion and Protection at Ext. 5077.

The Senior Management Group has reviewed this report.