Beyond the Curb –

Tracking the Commingled Residential Recyclables from Southwest WA

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Executive Summary

In March 2009, the Washington Department of Ecology followed up on the previous effort of EPA's Region 10 Initiative, Contamination in Commingled Recycling Systems Standards & Guidelines, by holding a statewide kickoff meeting for the WA Commingled Recycling Improvements Project. The kickoff meeting resulted in local government agreement to collaborate regionally to address reducing contamination in commingled recycling systems in Washington State. Each regional workgroup (Southwest, Northwest, and Eastern/Central – see Appendix A) agreed to involve all stakeholders—local governments, material recovery facilities, haulers, and end-users—and decide regionally on their approach and objectives. This report represents the work accomplished by the Southwest Region Workgroup over the course of approximately one year.

The Southwest Region Workgroup (Workgroup) convened in April 2009 and began the process with a shared understanding of the similarities and differences of the commingled collection programs in the region (Appendix B), identified which processors were receiving material flow from each jurisdiction (Appendix B), and determined their overall objective was to address contamination and material loss in single-family residential commingled curbside recycling programs in the counties of Clark, Grays Harbor, Lewis, Mason, Pierce, and Thurston, and the cities of Longview and Port Angeles. A fact-finding mission was the first step for the Workgroup in order to meet their agreed upon goals:

1. Obtain the knowledge necessary to make informed decisions on programs
2. Provide data and context to elected officials
3. Provide consistency in public education messages (including dangerous items like sharps)
4. Reduce problems in sorting at material recovery facilities (MRFs)
5. Create feedback loops, both positive and negative, for the system as a whole
6. Identify possible funding mechanisms for increased public education

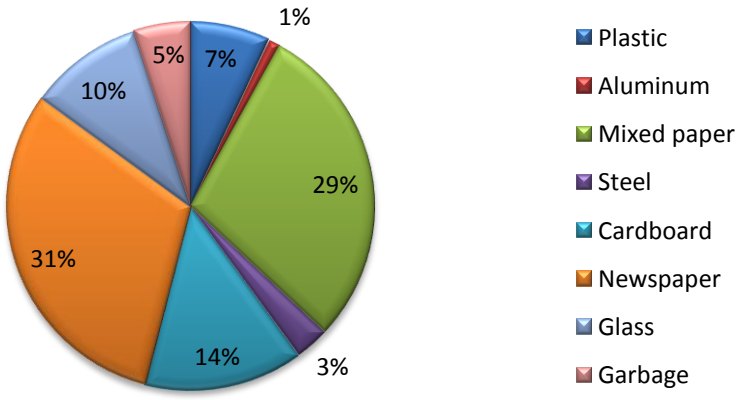
The Workgroup met monthly and at each half-day meeting all stakeholders shared their perspective on the issues they face with each material. Guest presenters representing end-users were invited to obtain data on the final use of each material (only local paper mills were consistent end-user members of the workgroup). By using an identical set of questions for each material (Appendix C), we were able to track materials and obtain data in a consistent and fair manner, giving each material focused attention.

Due to the scope of the project, the workgroup agreed to rely on existing data when available and on anecdotal information to understand the 'story' of each material as it made its way from the curb, to the MRF(s), to eventually its final end-use.

Letters of endorsement by various Workgroup participants regarding the process and the findings in this report can be found in Appendix D.

Summary Findings of Materials in the Commingled Residential Recycling System

What is in the Commingled Cart (by weight)?



What is collected in the commingled singlestream programs in the region?

Collected in All Programs

Corrugated cardboard
Aluminum & Steel cans
Phone books
Mail
Magazines
Catalogs
Boxboard (shoe & cereal boxes)
Paper bags
Newspaper & inserts
PET/HDPE bottles & jugs

Collected in Some Programs

Glass bottles & jars
Aluminum foil & pans
Pots & pans
Aerosol cans
Scrap metal (< 2ft & 35 lbs)
Frozen food boxes
Shredded paper
Milk cartons/Juice boxes
Egg cartons
Soda/Beer cartons
Aseptic cartons
Ice cream cartons
Paper cores/rolls
Paper giftwrap
Paperback books
Plastic bags
Buckets
Dairy tubs & cups
Pill bottles
Nursery pots

Not Collected

Waxed boxes
Non-bottle/jar glass
Large scrap metal
Hangers
Juice pouches
Batteries
Ammo
Paper towels
Plates & cups
Napkins
Tissues
Food soiled paper
Metallic giftwrap
Styrofoam
Chip bags
Trays & Clamshells
Frozen food bags
Lids & Caps
Toys
HazWaste containers

Collection

Material Category	% of Tonnage[1]	Consistent Collection	Consistent Messages
Cardboard	**14%**	🟡	🟢
Glass	**5% - 10%**	🔴	🟢
Metal	**4%**	🟡	🟢
Newspaper	**31%**	🟢	🟢
Plastics	**7%**	🔴	🟢
Mixed Paper	**29%**	🔴	🔴

Processing

Material Category	% of MRF Revenue	Significant Processing Issues	Source of Cross-Contamination
Cardboard	**10%**	🟢	🟡
Glass	**(-$40)**	🔴	🔴
Metal	**14%**	🟡	🟡
Newspaper	**3%**	🟢	🟢
Plastics	**6%**	🔴	🔴
Mixed Paper	**59%**	🟡	🟡

Manufacturing

Material Category	Export/ Local	Yield Loss	Prohibitives (*see Glossary*)	Outhrows (*see Glossary*)	Final Product (if collected commingled)
Cardboard	🟢	**15%**	🔴	🟡	*Corrugated boxes, bags, boxboard*
Glass[2]	🔴		🔴	🟢	*Aggregate (road base, etc)*
Metal	🟢		🟡	🟢	*Aluminum cans & steel rebar*
Newspaper	🟢	**16%**	🔴	🔴	*Phone books, bags, newspaper*
Plastics	🟢	**16%**	**?**	**?**	*Carpet, clothing, fiber fill, & thick-walled plastic products*
Mixed Paper[2]	🔴	**?**	🟡	🟢	*Boxboard and box dividers*

1. *Incoming tonnage total includes 5% - 10% of garbage*
2. *Considered a major issue for Export/Local due to limited market options*

KEY 🟢 Not An Issue 🟡 Minor Issue 🔴 Major Issue

What are the energy savings for recycling each material?

Energy Avoided for Recycling[1]
(Million Btu/Ton of Material Recycled)

Materials	Net Energy Savings[2] (Postconsumer)
Aluminum cans	206.42
Cardboard	15.42
Glass	2.13
Mixed paper	22.94
Newspaper	16.49
Plastic - HDPE	50.90
Plastic - PET	52.83
Steel cans	19.97

1. Explain
2. Includes process and transportation energy inputs

Source: EPA Report

Is it 'worth it' to collect this material in the commingled singlestream system?

Cardboard (OCC) - Yes. Old cardboard is effectively sorted, has local and export markets, has a high market value, and is recycled into products that would otherwise use wood chips to manufacture. Of all the materials in the commingled cart, it's the quickest, easiest, and least expensive to remove from the commingled mix.

Glass Containers - No. Because glass breaks—unlike the other commodities—it poses significant problems and hazards for the processing and end-use parts of the commingled system. Not only does it contaminate the paper, but because it has been commingled, its potential end-uses are dramatically reduced from an environmental and economic standpoint. When glass is commingled in singlestream collection programs in Southwest Washington, it eliminates the ability for the glass to be recycled into another glass container or for use in fiberglass.

Aluminum - Yes for aluminum cans, but no for aluminum foil and foil containers. While smashed aluminum cans do have the potential to get missorted with paper or fall through the processing equipment and end up as a residual, they cause few problems in the system as a whole. They have a very high value in proportion to percentage of their volume in the commingled mix. There are local end-markets that complete the closed-loop system by manufacturing them back into cans, and recycling aluminum cans has significant environmental benefits in energy use reductions. There is no value in collecting aluminum foil and foil containers in the commingled stream—at best, they are an outthrow, and at worst, a prohibitive (*see Glossary*). Markets for used aluminum beverage containers are interested in cans, not other aluminum products. Foil products contain more iron and melt at a much lower rate than cans, and consequently, end up as ash. Foil products also move through the

processing system like paper, contaminating paper bales and are ultimately disposed of by paper mills.

Steel - Yes. While the contribution to overall steel production is minimal, steel cans do have value to steel manufacturers as well as processors, and cause minimal problems throughout the system. Loose steel lids are not recovered due to size and shape.

Mixed Waste Paper (MWP) - Yes. As an overall category, mixed waste paper makes up a large percentage by weight and volume of the residential wastestream, has a strong export market, and has environmental benefits when used as a feedstock for making fiber products. However, it is important to remember that the category of mixed waste paper is a specific commodity, and that not all types of residential waste paper can be recycled with mixed paper. Because Chinese paper mills are purchasing the vast majority of the mixed paper produced in this region, the following types of paper products that are going to those mills are not recycled and should be avoided in commingled collection programs (these are also problematic at domestic paper mills): poly-coated containers (milk, juice, frozen food boxes), aluminum coated containers (aseptic boxes), cores (tissue and paper towel rolls), book bindings, wet strength paper (beer and soda carriers), window envelopes, and finely shredded paper (also problematic for processors).

Newspaper (ONP) - Yes. Although it is declining in volume as part of the residential mix, newspaper has value to domestic and Chinese paper mills. It is a material that is easily understood by the public, is universally collected in all programs, and does not cause cross-contamination for most materials, but can cause yield loss (*see Glossary*) at cardboard mills.

Plastic Containers (PET & HDPE) - Yes. PET, HDPE bottles and jugs have value, sustainable markets, and the public understands descriptions of these plastics. However, flattened bottles and jugs do cross-contaminate paper and cardboard and end up disposed by paper mills. Other than bottles and jugs, if more plastics are included in the collection program, the public becomes confused. The result is a 25% increase of non-program plastics included in the cart. The non-program plastics, once mixed, have limited markets due to the lower grade.

Key Issues and Recommendations

As the Workgroup reviewed the data gathered over the previous year, the overall questions were:

- *What do you include in the commingled system?*
- *How much can be effectively separated and recovered?*

The following key issues, and their associated recommendations, are the critical focus areas in order to address contamination and material loss in single-family residential commingled curbside recycling programs in the Southwest Region of Washington (listed in no particular order).

1. **Consumer awareness and level of responsibility – Their reasonable expectation that if it goes in the cart, it's recycled**

Recommendations:

1. Educate that not everything is recyclable curbside or in the commingled cart.
2. Establish feedback loops throughout the system.
3. Recycling isn't free—Educate residents on what they are paying for to have curbside recycling service.

2. Glass is a contaminant in the commingled stream and very little is going back to glass

Recommendation:

Keep glass separate from other recyclables.

3. Plastic film has significant processing issues and the result is very dirty ('MRF film')

Recommendation:

Keep plastic film out of curbside collection programs.

4. MRF employee safety regarding sharps, other medical waste, and explosives

Recommendation:

Educate the public about proper disposal of these materials.

5. Lack of consistency in our programs and messages across the region

Recommendations:

1. Combine Western county/city programs for those that share media sheds.
2. Combine education resources for clarity and consistency.
3. Convene municipal governments and haulers within regions to establish program standards.
4. Educate our own local jurisdictions to affect change.
5. Choose materials based on those that get recycled – Those that are cost-effectively and sustainably recovered at their intended market.

6. Lack of product stewardship/producer responsibility for materials

Recommendation:

Educate local policy makers about problem materials in the commingled stream and advocate for solutions and financing.

7. State and federal goals are driving local diversion goals

Recommendation:

Switch the focus from collection to recovery. Recovering usable materials suitable for manufacturers is the priority of recycling programs. Diverting materials from the garbage can to the recycling can at the point of collection when those materials end up disposed at a processor or manufacturer is not recycling or diversion.

The Southwest Region Workgroup will resume meeting late summer of 2010 to discuss an implementation strategy to prioritize and pursue the above recommendations.