

# Commingled Recycling Systems – Preventing Contamination at the Curb, MRF and Mill

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# Overview

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- What is 'commingled' and how did we get here?
- What is the problem with the current system?
- Working towards solutions – A regional effort
- Collection and Processing Standards & Guidelines
- Writing local policies and contracting for quality
- Contacts

# Collection Methods



3-Bin (or more)



Dual-Stream



Single-stream

‘Commingled’

# Commingled Collection's Rapid Rise

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## ○ In Washington:

- 3-bin systems were the first, but are declining in favor of commingled collection
- Dual- stream system hit the curb in 1998
- Single-stream systems started in 2003
- Of the 80% of Washington residents that have access to curbside recycling, the vast majority are using a commingled system or are living in a community that will soon make the switch
- Glass collection methods vary (commingled with all materials or just containers, separate bin at curb, and depots)

# Commingled Collection's Rapid Rise

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## ○ In Oregon:

- Most cities had multiple-bin programs by 1986
- Commingling began in the mid to late 1990's
- Two jurisdictions experimented with single stream, but later separated out glass
- The first carts were used in 2000
- Most program now use carts for all recyclables except glass and motor oil
- None of the programs include glass in the commingled stream (use depots or separate curbside bin instead)



# Why Go Commingled?

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- Commingling allows for automated collection
- Benefits of automated collection:
  - Increased efficiency
  - Decreased worker injuries
  - Wheeled cart with lid provide convenience and privacy to residents
- Little or no sorting required = greater participation by residents

**Commingled collection also means materials need to be sorted prior to recycling**



# What is the problem with the current commingled recycling system?

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- Collection does not equal recovery—Recyclable materials are getting ‘lost’ in other commodities
- Lost materials equals lost resources—Recycling is about resource conservation, not landfill space
- In a global marketplace, current trade association standards are not working to ensure quality at the mills
- Problematic materials reduce efficiencies at MRFs and mills, and end up as garbage
- Confusion by customers about what can be commingled

# Collection $\neq$ Recovery

King County (WA) Puget Sound MRF Assessment (2006)

<b>Curbside Material</b>	<b>Sent to Proper Market</b>	<b>Cross-Contaminant or Residue</b>
<b>Newspaper, Mixed Paper</b>	98-99%	1-2% lost
<b>PET</b>	47%	53% lost
<b>HDPE</b>	72%	28% lost
<b>Aluminum</b>	64%	36% lost
<b>Tin</b>	77%	23% lost
<b>Glass</b>	90%	10% lost

# Collection $\neq$ Recovery

Metro (Oregon) MRF Contamination Study (2004-05)

<b>Curbside Materials</b>	<b>Tons Collected</b>	<b>Tons Lost</b>	<b>Loss Rate</b>
<b>Newspaper</b>	66,936	694	1%
<b>Cardboard</b>	20,067	4,153	21% lost
<b>Metal</b>	4,062	583	14% lost
<b>Plastic Bottles</b>	3,390	800	24% lost



## How are recyclables getting lost?

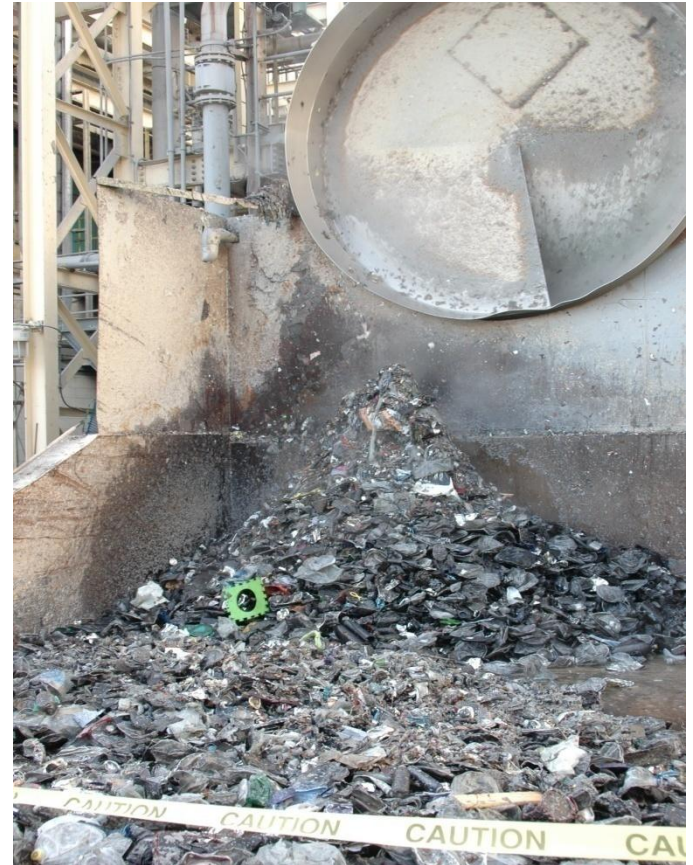
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- MRFs are seeing more non-program recyclables coming in, adding to the difficulty in un-commingling recyclables
- While some of the ‘lost’ recyclable materials are ending up in the residue at the MRF, a larger problem is these materials are getting sent to the wrong markets, mixed up with another commodity—and become garbage

# Lost Materials = Lost Resources

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- When metal and plastic containers arrive in a bale of paper at a mill, then pass through the pulper, these once recyclable products are rejected and end up as garbage



**NORPAC Paper Mill**  
Longview WA, Feb 2008


# Lost Materials = Lost Resources

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- Pulper rejects have increased 7-10 times as suppliers have switched to commingled collection systems



Blue Heron **Paper Mill**  
Portland, Oregon, Feb 2008



# Recycling is about resource conservation, not landfill space

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- The benefits of recycling are realized when those materials replace raw materials in product manufacturing
- Upstream impacts in manufacturing are 10-20 times greater than end of life impacts. These lost resources amount to much more than lost landfill space. This becomes even more important as the focus shifts to looking at how recycling plays a role in reducing greenhouse gas emissions



## What about existing standards?

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- Institute of Scrap Recycling Industries (ISRI) is the existing market standard
- According to King County 2006 MRF Assessment Study, “MRF performance and product quality is *almost never measured* against ISRI’s formal specifications”

# Existing standards are not working to ensure material recovery

**Standard:** ISRI #8: Special News, De-ink Quality (#8 ONP)  
 Prohibitive materials.....None Permitted  
 Total Outthrows may not exceed..... $\frac{1}{4}$  of 1%

NORPAC Paper Mill

Longview, WA

Supplier	NORPAC Supply System	Sold As (ISRI)	% Outthrows (Non-news fiber)	% Prohibitives (Non-fiber)	% Glass
2001 and Prior Average ALL Suppliers	100% Source Separated	#8	0.25 – 0.5	0.0	0.0
Sep 2006 – Dec 2006 Weighted Average ALL Suppliers	68% Co-mingled	#8, #7	15.0	3.4 % Pulper Rejects	0.33



# Problematic Materials

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- MRFs are designed to process flat fiberstock (paper, cardboard) and containers
- Anything small, such as broken glass, or flexible, like plastic bags, causes problems when commingled—impacting efficiencies at MRFs and the quality of the other commodities when they reach the mills



# Customer Confusion

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- Commingled collection carts look like garbage cans
- Residents know materials will be sorted (“when in doubt, throw it in” behavior)
- Recycling programs’ Yes/No lists vary even from neighboring jurisdictions that use the same MRF

# Working Towards Solutions – A Regional Effort

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- Convened by Region 10 EPA in 2007, stakeholders in the states of Oregon and Washington:
  - Agreed there was a problem with the current commingled recycling system
  - Agreed to work together for one year to look at the problem and create standards for collection and processing
  - Agreed a market-based standard was the best approach
  - Agreed on a vision and mission



# Commingled Recycling Systems Standards and Guidelines Initiative

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## Vision Statement

To develop a standard and guidelines for commingled recycling systems such that:

1. Cross-contamination of recyclable materials would be reduced;
2. The quality and quantity of materials recycled would be increased;
3. The highest percentage of materials that are intended to be recycled would be captured.

# Commingled Recycling Systems Standards and Guidelines Initiative

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## Mission Statement

To agree to a clear and measurable standard and guidelines that:

1. Allows governments and other contracting entities to easily and consistently specify that their materials are collected and processed according to the standard and guidelines for haulers and MRFs;
2. Allows haulers and MRFs to achieve a higher market value by meeting the standard and guidelines;
3. Increases the overall quantity and quality of material recycled;
4. Reduces the quantity of recyclable material lost as either outthrow or prohibitive materials in other recycling streams;
5. Has a consistent measurement and evaluation system that is cost effective and transparent;
6. Encourages and rewards more effective and efficient collection systems.



# Commingled Recycling Collection Standards & Guidelines

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- **Guidelines** for collection systems
- **Measurable standard** for incoming materials to MRFs
- **Tools:**
  - Decision flowchart
  - Material specification
  - Annual audit at the curb (<5% prohibitives)
  - Consistent customer education

# Decision Flowchart for Commingled Recycling Collection Programs

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## Examples:

- **Is the MRF which processes collected materials designed (and permitted, if applicable) to sort and capture the materials being considered for recycling purposes?**
  - If no, look at alternative means of collection
  - If yes, next
- **Does the material considered routinely become a MRF residual, or outthrow or prohibitive in another commodity stream?**
  - If yes, set performance standards and measure performance. Policy decision
  - If no, next
- **Does the MRF routinely sort the material such that the level of prohibitives and outthrows meet end market standards?**
  - If no, set performance standards and measure performance. Policy decision
  - If yes, next

# Collect in a Single Stream Program

Yes – OK to mix together	With Preparation	No – Use other collection methods	Questionable	
<p><b>Newspaper</b>  <b>Junk mail</b>  <b>Scrap paper</b>  <b>Cardboard</b>  <b>Magazines</b>  <b>Plastic bottles and tubs 6 oz. or larger*</b>  <b>Rigid plastic plant pots 4 inches or larger</b>  <b>Plastic buckets of 5 gallons or less</b>  <b>Aluminum</b>  <b>Scrap metal</b>  <b>Tin</b></p>	<p>Shredded paper in a paper or plastic bag depending on requirement of incoming MRF.</p> <p>Empty metal paint cans, small metal items in can</p>	<p>Glass            Batteries            Yard debris            Motor oil            Food contaminated paper            Loose metal less than 2 inches            Metal larger than 30 x 8 inches or more than 30 pounds            Loose shredded paper            Frozen food boxes</p> <p>Plastics:            Bags and film            Foam/expanded plastics            Large items (e.g., toys, lawn furniture, storage crates)            Lids and trays            Clamshells and bakery containers            Food contaminated            Biodegradable plastics            Cups, plates, silverware            Blister packaging            Any plastics with a capacity of less than 6 ounces.</p>	<p>Ream wrappers            Beer/soda paperboard carriers            Aseptics            Gable tops</p>	

# Effective Customer Education Tools

## ○ Label on Lid of Recycling Cart:

- Use photos
- Use type/shape of plastics, not resin numbers

### RECYCLING ONLY

All recyclables must be placed inside cart.

### NO GLASS

For a list of glass recycling centers, visit [www.piercecountywa.org/recycle](http://www.piercecountywa.org/recycle)

of any kind. No styrofoam, hot ashes, garbage, food or yardwaste.



**CARDBOARD:** Flatten boxes. Place inside cart.



**CANS:** Aluminum and tin cans. Rinse out. Flatten (optional).



**PLASTIC:** Bottles only, such as milk, pop, detergent or shampoo bottles. The opening must be smaller than the base. Rinse out and remove lids.



**PAPER:** Clean and dry newspaper, magazines, catalogs, mail, writing paper, phone books, cereal and other paperboard boxes, paper frozen food boxes, paper bags.



#### DO NOT RECYCLE THESE ITEMS:

Glass, food-contaminated cardboard, paper or boxes, aluminum foil, scrap metal, metal hangers, aerosol cans, yogurt, margarine or other similar containers, bottles that contained motor oil or hazardous materials, such as pesticides, herbicides or automotive fluids.

QUESTIONS OR CONCERNS? Call: (name & phone # of your hauler is listed here on your cart label)

# Effective Customer Education Tools

## ○ In-home outreach:

- Use photos
- Use type/shape of plastics, not resin numbers

### What goes in my new recycling cart?

**Yes** Put these items in your recycling cart.

Milk jugs

Plastic bottles (necks smaller than base)

Paper milk-style cartons

Phone books

Shredded paper

Mail, magazines, mixed paper and catalogs

Metal cans

Aluminum cans

Newspaper & inserts

Paper bags

Cereal boxes

Cardboard

Paper or frozen food boxes

**No** DO NOT put these items in your recycling cart.

Glass

Ceramics

Styrofoam peanuts

Glassware

Batteries

Aerosol cans

Toxic product containers

Plastic tubs

Plastic lids

Foil

Plastic bags

Light bulbs

Chip bags

Plastic cups

Styrofoam containers

Frozen food bags

Pill bottles

Juice boxes

Metal hangers

Food-contaminated paper plates and napkins



# MRF Standards & Guidelines for Commingled Recycling Processing

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- **Identified obstacles** that increase cross contamination and reduce efficiency
- **Measurable standards** on outgoing materials
  - Goal to measure the first year to set baseline
  - Set multi-year standards off baseline

# Barriers for the MRF

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- **When commingled**, these are responsible for the majority of contamination, damage and inefficiencies at MRFs:

1. **Glass**
2. **Plastic bags**
3. Shredded paper
4. Flattened containers

**Dangerous:** Sharps and other biohazard waste

<b>Standards for MRFs Processing Commingled</b>	<b>Current Status</b>	<b>Goal – First year Going to the proper market</b>
<b>Paper – Average of all - Brown Kraft</b>	<b>98% 75%</b>	<b>98% 80%</b>
<b>Plastic – All</b>	<b>70-75%</b>	<b>80%</b>
<b>Metal - All</b>		<b>80%</b>
<b>Glass (If part of commingled collection)</b>	<b>80%</b>	<b>80% to non-disposal market</b>  <b>Measure:</b> <ul style="list-style-type: none"> <li>○ % going to glass to glass</li> <li>○ % going to aggregate</li> <li>○ % in paper</li> </ul>
<b>Recyclables in Residual</b>	<b>Measured</b>	<b>Measured</b>
<b>Total Residual</b>		<b>Measured</b>
<b>Total Prohibitives</b>		<b>Measured incoming</b>

# Evaluation & Measurement Protocol for Commingled Recycling Standards

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- **Goal:** An evaluation system for the commingled standards and guidelines that includes financing, roles, and accountability
- **Deliverable:**
  - Draft plan on how to measure contamination levels coming in and leaving participating MRFs



# Evaluation & Measurement Protocol for Commingled Standards

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# Creating Market Demand

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- **Goal:** A plan to ensure that the commingled standards and guidelines are incorporated into contracts, purchasing, policy, and permitting to create a market demand
- **Tools:**
  - Informational slide show
  - White paper (link)
  - Boilerplate language for contracts and service level ordinances

# Start Local – Contracting for Quality

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- Sample language for contracts/service levels for processing:
  - [link]
- Sample language for contracts/service levels for collection:
  - [link]

[If you are unable to access the links above, please contact staff on the next slide to have the document emailed to you]

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