



Rapid Response

1402 Third Avenue, Suite 1420
Seattle, Washington 98101
Tel 206-352-2050
Fax 206-352-2049
www.pprc.org

Rapid Research **Is Commingled Recycling the Best Choice for a Municipality?** **Walla Walla Resource Conservation Committee**

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Request:

- Are other cities “comingling”? Are other cities still source-separating?
- How successful is comingling in practice?
- Are rumors of 50% contamination accurate?
- Do commingled materials go to different processors than separated materials?
- Where does the clean white paper go?
- Do local re-processors have enough materials?

Background

Walla Walla Resource Conservation Committee is acting as advisor to the City of Walla Walla, WA as City Council makes a decision on whether they will implement a commingled recycling effort. They would like to recommend source separation rather than comingling but are not certain that it is affordable. Potential drawbacks to a successful commingled recycling program include the concern about how much of the materials end up being actually used rather than sent to a landfill because they are too dirty or not separated well enough to be delivered to the correct materials market. In some estimations, 50% of commingled materials are unusable and sent to the landfill instead of actually being recycled into new products.

Another concern is that materials are sent directly overseas and sold as low cost mixed materials rather than to regional re-processors.

Criteria for Recycling Program Decision Making

- Acceptable for customers
- Economically feasible
- Results in highest percentage possible of materials being delivered successfully to re-processors and made into new products/lowest contamination rate possible
- Supports Northwest economy and employment
- Environmentally and socially responsible

Major Findings:

- Most cities advertize commingled recycling programs that allow homeowners to put all allowed recyclables into one mixed receptacle for pick up rather than asking for materials to be separated.
- There is broad agreement that commingled programs yield more usable material even after contaminated materials are subtracted.
- No cities involved in the studies or interviewed are seriously considering going back from a commingled to a source segregated program.
- Contamination rates are often cited as being between 5-15%.

- White paper can be sold to regional mills; however it comes from commercial and not residential programs. Any white paper included in residential mixed paper recycling helps improve the stock of fiber going to newspaper production.
- To keep contamination rates low, municipalities can work with haulers and MRF's to make necessary adjustments that will raise rates of clean material.
- Glass causes serious problems when included in commingled systems.
- Construction/Demolition debris gets much better recycling rates if it is source separated.
- Environmental impacts of transporting materials are not an important factor, and are generally over estimated.

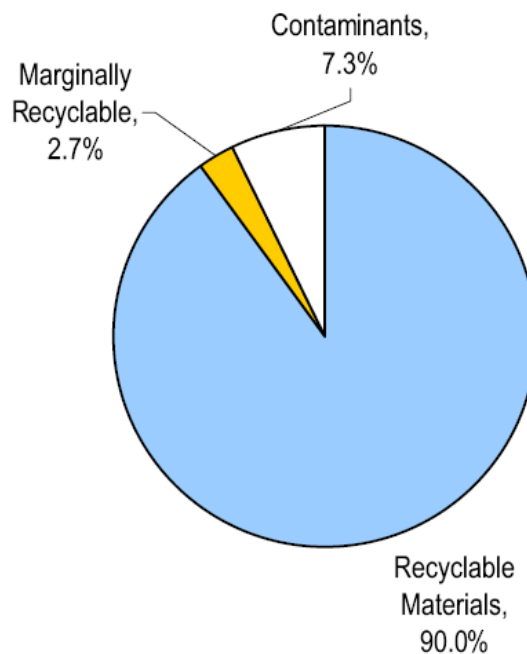
Insights from MRF's and Federal, State and Local Governments

MRF's

Four Puget Sound MRF's from 2006 King County survey:

- Residual rates (after recyclable materials are removed) for the Puget Sound MRFs range from 3% to 10%. Nationally, residual rates range from a low of 2-3% to over 50%. In California, a survey of 40 commingled MRFs found the statewide residual rate averaged 14%.

Figure 2: Estimated Composition of Incoming Commingled Material, Four Puget Sound MRFs



- Offshore paper mills are very satisfied with the paper from Puget Sound MRFs; domestic mills would prefer higher quality fiber, but are relaxing standards.
- Virtually all of the mixed paper and 75% to 80% of the newspaper from the Puget Sound region are currently sold to offshore markets.
- With relatively low-cost labor, offshore mills recover plastic, metal, and larger glass pieces from the fiber bales they import from the U.S. This means an estimated 6,000 tons of non-conforming recyclables are recycled by off-shore end-users.

- Labor costs for domestic mills are relatively higher, and these mills cannot afford to pick nonconforming recyclables before pulping. As a result, 2,000 to 4,000 tons of non-conforming recyclables are currently “lost” through landfilling. This represents less than 1% of the incoming commingled materials delivered to the four Puget Sound MRFs.
- Recommend a unified standard across a county or region to improve the quality of materials collected.

JMK Fibers, Tacoma, Doug Swan

- Accept commingled material from 9 municipalities. The only municipality they work with that is still providing source-segregated material is a small township.
- Glass should be kept separate.
- Contamination rate is under 5%.
- Technology is making commingling more and more effective.
- Carefully audit inbound materials and provide immediate feedback about contamination to the supplier.
- Multi-family housing contamination is not any higher, presumably because the managers of the complexes provide education to tenants.
- Believes that commingled recycling is here to stay and that the key is in educating consumers and in gradually adding commodities as process techniques and technology permit.

Waste Control, Longview, Rolly Ensign

- Since most material comes to Waste Control commingled, it would not be an advantage to them to receive source-segregated material from a single municipality.
- Waste Control’s system is set up to sort mingled material. They are adding technologies such as a magnet to pull metals and a shaker screen system, which will increase the quantity of usable materials from the commingled stream.
- These technologies make it cost-effective to increase the quantity of usable material, whereas it is not financially feasible to slow down the sorting line, and increase worker-hours to do a better sort.
- Contamination rate is generally about 15% from single family pickups, but as high as 50% from 90 gallon tubs from multi-family housing sources.
- The quality of material is highly dependant on on-going consumer education about recycling. When Longview’s initial education program decreased, so did the quality of the materials. Education needs to be on-going.
- Biggest sources of contamination are Styrofoam, grass clippings, wood and oil.
- Individual containers yield much higher quality material than large mixed tubs at multi-family complexes. People need to feel responsible for their contribution. Enforcement is also much easier with individual containers.

Federal, State and Local Governments

EPA Project to identify standards for MRF’s

- Region 10 EPA is currently funding a work group for OR and WA MRF’s and local government to look at standards for MRF’s.
- Goal is to develop standards for MRF performance, to reduce residual materials and recyclable materials landfilled. Discussions are in the early stages.

Portland Metro, Steve Apotheker

- Based on Metro’s data, a community recycles more material in commingled programs (about 5% after subtracting contaminated materials).
- MRF’s in Walla Walla generally export materials, whereas in Portland Metro newsprint goes to three local mills.
- Contamination rate in newsprint is about 9%.

- Walla Walla could consider shipping newsprint to the Metro area for regional processing.
- Cardboard has both local and overseas markets.
- Currently glass goes to California, but Strategic Materials is opening three-color glass recycling plants in OR/WA in 2008 (Portland, Seattle and Kalama).
- Plastics go either to BC, CA or China. Denton Plastics may have a new facility in Oregon for municipal plastics recycling if they find funding for it.
- If a priority is for materials to be used in local markets, source separating is the best strategy since there is more interest by local processors in clean and separated material.
- Contaminated materials that go to Asian markets may be more completely recycled than materials sorted by MRF's in the U.S. since labor is less expensive and it is worth separating all of the material. For example if there are plastic bottles in with paper, they will probably be removed and recycled, whereas in the U.S. they will probably be discarded as contaminants of the primary material.
- Since the same hand sorting would be done in China or in the Northwest, Steve didn't feel that sorting conditions would vary substantially enough to be a work-safety issue. The only exceptions might be shards of glass or small amounts of unsanitary food waste.
- Walla Walla can reduce the contamination of their material by working with haulers and MRFs and negotiating to lower contamination rates by slowing sorting/conveyer belt speed, running shallower depths of materials during sorting and specifying training standards for example.
- When choosing MRFs, Walla Walla should ask about employee turnover rate and whether staff members are permanent or temporary, since these factors impact contamination rate measurably.

Oregon DEQ, Peter Spendelow, Participant in the EPA MRF Working Group

- Feels there are major problems in the existing system, however doesn't believe a source-segregated system would be an improvement.
- Favors a commingled system with adjustments such as:
 - Separate glass collection.
 - A "semi-commingled" system with separation of containers and paper.
 - Collection of odd items in a "red bin" on a different day from normal recyclables in roll carts such as the Marion County program. Red bin items include glass, motor oil, batteries and pesticides.
 - Improved sorting process by slowing down the sorting line, improved employee training and more specifically defined goals and objectives about material contamination.

Institute for Environmental Research and Education (IERE), Rita Schenk, Executive Director

- According to IERE's environmental life cycle analysis research, transportation is generally only responsible for a small percentage- about 5% of the total environmental impact of a product's life cycle; so that shipping recyclables overseas may not be a large environmental concern. However, social impacts of shipping materials overseas to be recycled may be a much larger issue.

San Diego County, Pauline Priest

- Operate a commingled program and agree that they collect more usable material even after contamination, however since they expanded their program as they switched to commingled, they can't accurately track how much more material is resulting from commingling.
- San Diego publishes the following information about the advantages of source-separating construction and demolition debris

Construction Demolition Debris

<http://www.sdcounty.ca.gov/dpw/recycling/c&dmaterials.html>

Source Separation of Construction/Demolition Debris

The source-separation of [materials](#) on site for recycling is generally more cost-effective than disposal or commingled recycling and yields an average facility recycling rate of 90+ percent. Source-separation also helps create higher-end markets for recyclables, such as the manufacture of new recycled-content building materials.

Commingled Recycling

On job sites where space is limited, having fewer recycling containers on site and commingling the recyclables can save valuable space. The recycling rate of commingled programs, however, has proved to be significantly lower than that of source-separation programs. In commingled programs, materials that have the potential to be recycled, such as drywall, carpet and ceiling tiles, are disposed of as garbage. The only way to quantify the amount of commingled materials recycled on a particular project is to use the recycling facility's recycling rate.

Additional Resources:

Effectiveness of recycling processors sorting curbside recyclables

<http://www.metro-region.org/index.cfm/go/by.web/id/19174>

How we got recycling all mixed up

Unsorted, 'commingled' waste is bringing Britain's reprocessors to a grinding halt, warns Jon Robins

<http://www.guardian.co.uk/money/2007/dec/02/cash?gusrc=rss&feed=15>

According to Friends of the Earth (UK), last year 280,000 tons of glass collected for recycling could not be re-melted. There is no green benefit from using glass to make aggregate because, as Friends of the Earth points out, 2kg of CO₂ is created for every ton of glass collected.

It is a similar story in other industries. Problems with commingled recycling are particularly acute in the paper sector, where shards of glass can cause a mill to come to a juddering halt. Industry group PaperChain blames commingled systems for 'having a negative impact on quality to the detriment of the long-term sustainability of recovered paper markets'.

Waste Monitoring Program 2006 Material Recovery Facility (MRF) Assessment

http://www.metrokc.gov/dnrp/swd/about/documents/MRF_assessment.pdf