Metro Report

Commingled Commercial Recyclables Processing Study

Final Report
Metro Regional Environmental Management
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EXECUTIVE SUMMARY:

Processing of Mixed Commercial Recyclables

A. Purpose of Study

This study was designed to answer the following questions:

1. Does the Metro region have the processing capacity and capability to handle more tons of mixed paper fibers and fibers/TAP (all fibers mixed with tin, aluminum and plastic containers)?

2. Does the region have the processing capacity and capability to handle single-stream mixtures (all fibers mixed with all containers, including glass)?

3. To what extent, and due to what practices, are collected recyclables lost through processing by inclusion in the wrong commodities (e.g., plastic or metal in paper fibers)?

4. To what extent are recyclable materials lost through inclusion in processor garbage?

5. How are processors and fiber end-use markets responding to the increasing extent of mixed-recyclables collection in the Metro region?

6. What messages should local governments and Metro convey to generators, collectors, and processors about the mixing of recyclable materials at each stage of recovery?

B. Background of Study

Local government solid waste managers and the Commercial Recycling Work Group, a committee of Metro-area recycling specialists, asked Metro to conduct this study to inform efforts at increasing commercial recycling. Increased recovery of commercial-source materials is a key strategy for meeting the region's goals, as outlined in Metro's *Regional Solid Waste Management Plan* and the *Waste Reduction Initiatives*.

Local governments in the Metro region encourage or require businesses to separate their recyclable materials for collection. To improve customer convenience and to allow more cost-efficient use of trucks and crews, most collection companies are moving from a system that keeps different materials separated toward a system in which all fibers (paper) and containers (metal and plastic—and increasingly, glass) are mixed together. Processors sort these mixtures into commodities for sale to end-use markets.

Some paper mills have complained about increasing quantities of unwanted items in the commodities they buy from processors. Some processors have expressed concerns about the higher costs to produce the lower-value commodities they can extract from mixed recyclables. Some recycling advocates have objected to a watered-down ethic of source separation and to the possibility that recyclables set out for collection are being disposed. Governments want to ensure that the recycling system can help achieve recovery goals while complying with regulations against disposing source-separated recyclables.

C. Study Methodology

Metro contracted with Environmental Practices, a Portland-area consulting firm, to sort out and weigh the components of fiber commodities produced for market from all-fiber and fiber/container mixtures. Because fiber comprises about 90% of commingled commercial materials recovered in this region, the study focused on principal fiber grades produced by each of eight facilities. Metro staff estimate that these eight facilities handle at least 80 percent of commingled commercial materials collected in the Metro region. The study team also measured the percentage of recyclables in hand-sorted garbage at processors and estimated the amount of recyclables in screened discards. The consultants and Metro staff observed processing operations and interviewed processor and end-use market (paper mill) employees. Oregon Department of Environmental Quality staff assisted in study design and statistical analysis of results.

Metro wishes to convey its appreciation to the processors that allowed and assisted this analysis of their operations and made staff available to answer questions. This report aggregates some individual processor data for the entire study group, including capacity and throughput. Processors are not identified by name.

D. Answers to the Questions

This section summarizes study findings, based on measurement, observation and interviews.

1. **Does the Metro region have the processing capacity and capability to handle more tons of mixed paper fibers and fiber/TAP (all fibers mixed with tin, aluminum and plastic containers)?**
   - Yes. Metro-region processing facilities have the aggregate capacity and capability to handle twice as many tons of mixed fibers and fibers/containers as are now delivered to them. Only two facilities in this study regularly run more than one shift per day. No facility claims to be operating at full capacity on any shift.
   - Unused capacity of 350,000 tons. The facilities participating in this study could handle at least 350,000 additional tons of material per year, whether residential or commercial. This is twice the amount of potentially recyclable paper disposed in the Metro region in 2000. Current total production of these facilities is 290,000 tons per year (not including one processor that would not disclose this information). Their aggregate capacity is 640,000 tons per year.
   - Capacity for mixtures. Because facilities process pure loads faster than mixed loads, and mixed fibers faster than fibers/containers, the actual excess capacity for mixtures may be no more than 250,000 tons per year for studied facilities.

2. **Does the region have the processing capacity and capability to handle single-stream mixtures (all fibers mixed with all containers, including glass)?**
   - One processor does it now. One processor accepts single-stream loads from out-of-region sources as well as material from in-region that contains significant glass. Other processors are seeing (and hearing) increased glass in fiber/TAP materials, especially from apartment building sources and mixed residential/commercial loads. (Single-stream collection is not endorsed by Metro-area local governments.)
   - Glass not recycled. Virtually all the glass in single-stream loads ends up disposed, either in processor-screened fines, hand-sorted garbage or shipped out in commodities to mills that then discard it. Glass mixed with fibers is treated as a contaminant by every facility.
   - Glass-contaminated commodities. The glass content of paper commodities produced by the single-stream processor (0.14%) is three times the average for all other facilities (0.05%) and five times the average (0.03%) when only fibers are sorted. (See Table ES-2.) Note that Facilities B and G, which reload material for further sorting elsewhere, both, have relatively high glass contamination levels (0.07% and 0.11%).

- Paper mill problems. Mills see glass as a major concern if single-stream collection increases. Only a few mills have had serious problems with glass to date, which included greater costs for equipment repair and replacement, production shutdowns and disposal. These costs affect recycling economics, including the price paid for commodities.
- Plastic and metal. Most paper mills consider plastic and metal a lesser problem than glass, even though plastic and metal out-throws averaged 10 times the level of glass in all fiber samples from single-stream sorting (1.5% vs. 0.14%). The same ratio occurred for all fiber samples at all facilities in the study (0.58% vs. 0.06%). Facility B, with 1.4% plastic/metal out-throws, not only sorts a fiber/TAP mixture that has considerable multi-family material, but also produces a fast-sorted reload. (See Table ES-2.)
- Capacity. The capacity of studied facilities to handle single-stream loads probably exceeds 100,000 tons per year.
- Automation. Automatic sorting equipment improves the economics of sorting single-stream loads, but it does not recover glass; it breaks it and screens it out of other materials, producing an unmarketable mix of glass, paper and dirt.
- Regulation. Local governments in the Metro region forbid mixing glass with residentially collected fibers but do not exclude this option for commercial routes. Because many collection vehicles serve residential and commercial customers on the same route, glass collected at commercial accounts can (and does) contaminate residential recyclables.

3. To what extent, and due to what practices, are recyclable materials lost by inclusion in the wrong commodities (e.g., plastic or metal in paper fibers)?

- Out-throw average. The average out-throw rate (bottles, cans and film misplaced in fiber commodities) was 0.65% for all fiber samples in this study. Weighting the study out-throw rates according to the quantity of each fiber commodity collected commingled in the Metro region brings the region's out-throw average to 1%. (See Appendix J, Table J. The region produces far more tons of the commodities with the highest out-throw rates—mixed scrap paper, ONP and OCC—than of the cleaner high-grade ledger and office pack grades.)
- Loss of containers. The 1% regional, weighted out-throw loss refers only to bottles, cans and recyclable plastic film, of which 17,000 tons are delivered to processors. This out-throw rate translates into 1,350 tons that leave processing facilities buried inside fiber commodities—a loss of 8% of the containers that processors handle. Another 6% of containers delivered to processors ends up in disposed residues, for a total processing loss of about 14%. (These numbers do not include bottle bill containers or containers that do not go to processors.)
- Misstated recovery rate. If these 1,350 tons of out-throws plus 4,000 tons of prohibitives included in fiber commodities were subtracted from the weights that end-use markets report to DEQ, the region's recovery rate would drop by 0.25%. Only 33% of the Metro region's fibers are collected in commingled form (135,000 tons out of 400,000 total), often as fiber-only mixtures. If all fibers were collected commingled with all containers in a single stream, the region's recovery rate could drop by one percentage point.
- Correlation with mixture. Commodities prepared from single-stream loads averaged out-throw rates of 1.6%, compared with out-throw losses ranging from 0.3% to 0.5% at *most* facilities that process fiber/container loads with only incidental glass. Samples taken from fiber-only loads averaged 0.1% out-throws. These differences are statistically significant at greater than the 95% confidence level (see Table H). One facility that processes a fiber/TAP mixture including multi-family loads with high container content had a 1.5% out-throw level that cannot be distinguished statistically from single-stream results.
- Automation. The highest out-throw rates were found in negatively sorted paper grades at mechanically automated facilities that process the most extensive mixtures. (Negatively sorted material goes off the end of the sort line after garbage and other commodities are removed.) Negatively sorted ONP #6, a mix of newspaper, magazines, mixed scrap paper and other fiber, averaged 4% out throws at

one automated facility. Less automated operations averaged 0.5% out-throws for this grade. Mixed scrap paper averaged 4.5% out-throws at another automated facility, compared with an average below 1% for this grade at facilities that handle simpler mixtures with less automation.

4. To what extent are recyclables lost through inclusion in processor garbage?

- Disposal rates. It is estimated that processors dispose at least 0.5% of all commingled recyclables they sort. Based on individual processor interviews, the average garbage disposal rate for all facilities in this study is about 1%. The study found that at least half of this garbage consists of recyclable material, both fiber and non-fiber. It was not possible within the scope and time frame of this study to measure the percent of all received materials that each facility disposes.
- Hand-sorted garbage. Based on samples by the consultant, the garbage that workers remove from sort lines averaged 45% recyclables. Metal, plastic and glass made up 26% of this quantity, and fiber comprised 19%.
- Screened garbage. Four facilities use screens to remove small fragments from the sort line, including dirt, broken glass, shredded paper, bits of cans and low-volume plastic bottles. In one facility, this material passes off the end of the belt. Screened mixtures are not recovered at this time, and appear to consist of at least 85% recyclable material, based on visual inspection. Processors estimate that screens add 0.25% to facility disposal rates.
- Disposal and mixture. Facilities handling fibers-only loads had much lower garbage rates than facilities handling more extensive mixtures. Most facility operators reported their own testing results, ranging from about 0.1% for fibers-only to 1.5% for single-stream, with fibers/TAP at about 1%.
- High and low. The highest rate of recyclables in hand-sorted garbage (70%) was found at the facility that sorts the most single-stream material. At the time of the study, sorters at this new facility were putting scrap metal in garbage, a practice that has since been corrected. This facility also disposes notable quantities of glass/paper/plastic/metal fragments that run off the end of the sorting line. In general, fibers-only processors had the lowest percentages of recyclables in hand-sorted garbage (28% to 50%).
- A seeming exception. One facility, which sorts mixed fibers/TAP, had the lowest percentage of recyclables in hand-sorted garbage (25%), partly due to well-trained permanent staff, but also due to high-speed automation that screens out fragments, and because this facility reloads much of its negatively sorted material for reprocessing elsewhere. This facility averaged the second-highest rates of out-throws (1.5%) and prohibitives (3.4%) in its fiber commodities.

5. How are processors and fiber end-use markets responding to the increasing extent of mixed-recyclables collection in the Metro region?

- Adjusting to mixtures. Half the processors in this study have invested in equipment that will enable them to handle increased supplies of mixed-recyclables collection.
- Recent changes. Two facilities installed new automated equipment in the three months before the study, and another did it nine months before. A fourth processor will move into a new, automated facility early next year. Processors are still experimenting with their new technologies.
- A place for everything. Processor investments have created a complex ecology that can handle virtually any type of load, from pure fiber to a total mixture of every curbside item. Automation reduces the number of shifts, and therefore the labor costs, needed to handle mixtures.
- Reloads. Several local and out-of-region processors and collectors sell unsorted or partly sorted commercial and residential mixtures to processors that can sort it economically. These reloads have high out-throw and prohibitive levels.
- The pressure to mingle. The need for cash flow to pay off large capital investments in automated processing equipment drives processors to compete for low-value mixtures they would have refused a few years ago—a competition that brings an air of inevitability to increased commingling. Collection companies—and some governments—favor increased commingling as a

way to constrain the rise in collection costs. Automated collection (one big roll cart) has contributed to even higher out-throw, prohibitive and disposal rates in other communities, and may become a trend in the Metro region that needs to be monitored.

- Commodity quality. More complex mixtures sorted with high-speed automation tended to produce commodities that do not meet published standards for the grade. Negatively sorted MSP and ONP grades consistently exceeded official out-throw and prohibitive limits at almost all facilities, possibly reflecting end-use market willingness and preparation to take more contaminated lower grades at a lower price.
- Paper mill concerns. Glass remains a concern for all paper mills. The jury is still out on whether increased screening at processors and mills can remove glass from paper. Out-throws and prohibitives as a whole increase mill disposal costs. As one processor said, "When the mills reach their limit, they push back." One regional mill has cut its consumption of mixed paper by 75% in the last six months due to contamination levels.
- End-use demand is sound. Although demand by Northwest paper mills for recycled grades is not expected to increase, regional mills prefer the low transportation costs of local supplies. These mills have adjusted their processes, standards and prices to accommodate the lower grades of material being produced from commingled collection. One mill has stated publicly it could absorb all mixed paper generated in Oregon.
- Economics. Lower market prices could counteract collection savings from commingling.
- Technology. Processors that use more automated equipment are looking into vacuums and air classifiers to remove shredded paper from broken glass, so less paper is lost. There is little evidence, however, that air classifiers allow screened or negatively sorted glass to be recovered. These mixed fragments include too much material that does not yield to air separation, e.g., metal, plastic and substances unacceptable to glass markets.
- Vertical integration. Processors that have strong alliances with collectors had the lowest out-throw and prohibitive rates. These alliances—often co-ownership, but sometimes only long-standing relationships—allow processors to control what they receive and to adjust to market and regulatory changes. Typically, such alliances concentrate on securing fiber-only loads or on keeping containers separated from fibers.
- Container resistance. Some processor/collector alliances that specialize in fibers-only loads may be discouraging customers from recycling their containers, and thus subverting the right to recycle.

6. What messages should local governments and Metro convey to generators, collectors and processors about the mixing of recyclable materials at each stage of recovery?

(Conclusions are presented in "E. Recommendations," below.)

E. Recommendations

The Metro Regional Environmental Management Department recommends consideration of the following measures to ensure the integrity and success of a recycling system that is responding to increased commingling.

1. Form a subcommittee of Metro's Solid Waste Advisory Committee to address the loss of recyclables and the increase in residue at processors and markets.

This subcommittee could address the above issues in a broad systematic way, including performance standards related to loss of recyclables and residue, roles and responsibilities of involved stakeholders, use of incentives and disincentives, and the economic impacts of changes to the system.

Some specific recommendations derived from immediate problems observed in the study are offered with respect to collection, processing and markets and may help shape the discussion of the subcommittee. Stakeholders on the subcommittee should involve haulers, private recycling collectors, processors, markets, local governments, Metro and the Oregon Department of Environmental Quality.

A. Collection

i. Prohibit the collection of glass mixed with fiber from commercial generators.
Metro and local governments should work to discourage and prohibit generators and collectors of commercial recyclables from mixing glass with fiber, as the local governments currently do with residential recyclables collection. This discrepancy between commercial and residential regulation leads to contamination of all materials when collectors mix loads from both sources on the same vehicle, or when processors mix loads at their facilities. Education and enforcement challenges may be found with multi-family generators and with recyclables collected from front-loaded containers and automated roll-carts. [Since the publication of this draft report, local governments have met and indicated their intention of adopting rules to prohibit the collection of glass mixed with fiber from commercial generators. All local governments intend to instruct haulers to collect glass containers separately from other containers, as well.]

ii. Monitor and enforce proscriptions against collecting glass mixed with recyclables.
Local governments have adopted administrative rules for residential recycling collections that require that glass be collected separately from fiber. Compliance with these rules may be slipping. A complaint-driven approach does not appear to be sufficient. One alternative is for a third party, such as Metro or local government representatives, to check deliveries to processors to ensure compliance. Where possible, collectors should leave notes and, if necessary, withhold collection for generators that do not comply.

iii. Develop consistent education, monitoring and feedback.
Generators need clear and repeated information, aimed both at employees and managers. Collection companies local governments and Metro should provide consistent messages to generators. Collectors should conduct regular inspections of loads and give feedback to generators.

iv. Promote increased recycling by businesses, including fiber-only and fiber/TAP (tin-aluminum-plastic) mixtures.
Messages may vary locally but should encourage only mixtures that processors can handle with minimal loss and contamination. All processors in this study have shown they can keep out-throw levels below 1% with a two-sort of fibers separated from mixed containers; most processors can produce commodities with less than 1% out-throws from fiber/TAP mixtures that do not include glass. Mixing metal and plastic containers with fibers, however, may open the door for more “incidental” glass. If stakeholders can agree on an acceptable level of recyclable losses, commingling offers convenience to generators, may increase participation and recovery (even accounting for out-throw losses), and improves collection economics. It is important to ensure that processors are capable of effectively handling fiber/TAP mixtures before promotion of this mixture to businesses.

B. Processing

i. **Discourage or prohibit processors from handling source-separated materials in ways that make them less likely to be recycled.**
A combination of government and market pressure is needed to prevent contamination and loss of recyclables caused by processors mixing a variety of materials, either on the floor of their facility before sorting or when reloading them for shipment to other processors. The City of Portland has such a prohibition. If processors mix loads from out-of-region single-stream sources and automated roll cart routes with cleaner regional loads, this will contaminate regional materials. Sorting loss levels should be monitored periodically. Based on container out-throws and disposal across all samples in this study, processors fail to recover more than 14% of all recyclable containers, scrap metal and plastic film delivered to them (see Appendix I).

ii. **Processors should provide clear and complete operating plans that indicate how all types of recyclables would be sorted, stored and marketed.**
These plans should describe how different mixtures would be handled to ensure maximum recovery of delivered loads. Plans should cover containers and scrap metal as well as fibers.

iii. **Processors need to do a better job of removing solid waste from fiber commodities that are produced.**
On average, processors removed 37% of the solid waste mixed with commingled recyclables. The balance of 63% of solid waste, or 4,065 tons, was shipped in fiber commodities to their respective markets. The amount of solid waste in fiber commodity shipments is expected to increase to more than 13,000 tons annually as commingling becomes a more accepted regional collection practice.

C. Markets

Fiber markets are faced with the consequences of increasing quantities of solid waste mixed with fiber and greater percentages of unusable fiber in commodities from processors. Although no specific recommendations are made in this report, it is crucial that markets are involved in the discussion because more recyclables are lost and more residues are disposed by markets than by processors.

2. Increase the focus on the recovery of plastic, metal and glass containers and scrap metal.

Some collectors may be discouraging their commercial customers from recycling containers and some processors do not accept containers at their facilities. For most commercial generators, container recycling collection is an optional service, unlike residential generators where it is always included in the service. As a result, commercial container recycling rates are 21%, compared to residential container recycling rates of 53%. Some options to increase inclusion of containers and scrap metal in commercial recycling collection are:

A. Include plastic bottles, metal containers, glass containers and scrap metal in a mandatory disposal ban that has been proposed by the Commercial Recovery Work Group for additional stakeholder discussion.

B. Increase promotion of container recovery by local governments and by the Commercial Recovery Work Group as part of their general outreach and targeted assistance program to businesses.

3. **Undertake additional research.**

Market and government stakeholders may want more and better data to make decisions about the region's approach to recycling. For instance:

A. **Obtain more objective and detailed data on processor disposal of residues to derive a more accurate estimate of recyclables lost through commingling.**

B. **Examine research done in other communities on best management practices and how these can affect out-throw, prohibitive and disposal rates as a result of system changes, such as moving to more automated collection (with wheeled carts) and more automated processing.** National data indicate that, unless best management practices are adopted, residue levels and commodity contamination are likely to increase from our current regional levels as these system changes are implemented.

C. **Research how other communities regulate, enforce and communicate about contamination with all stakeholders, including local governments, haulers, private recycling collectors, processors and markets.**

D. **Evaluate the importance of convenience (mixing of recyclables) for increasing recovery from commercial generators.** Are certain types and sizes of businesses more responsive to convenience? Can routing, equipment or education resolve problems?

4. **Work with the Oregon Department of Environmental Quality to revise existing administrative rules (340-090-0090) that prohibit the disposal of source-separated recyclable materials.**

With commingling, loss of recyclables is occurring both at the processor and the market. In effect, disposal of recyclables is taking place when containers are left in fiber commodities. While commingling does result in net gains in recovery, there are widely divergent levels of recovery by processors. In addition, increasing amounts of solid waste are being collected commingled with recyclables, with less than half of the solid waste removed and disposed by the processor. The majority of the solid waste is commingled with fiber commodities and sent to markets. Thus, the amount of recovered fiber reported to DEQ is inflated by the amount of solid waste in the fiber.

A. **DEQ should develop performance standards that are appropriate to commingling that address the loss of recyclables at both processors and markets.**

B. **DEQ should ask markets for the amount of solid waste contamination in their commodity deliveries. DEQ should reduce market shipments by this solid waste contamination to obtain more accurate figures for recovered materials.**

C. **DEQ should enforce those standards with processors through reporting and inspection.**

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TABLE ES-1: Commodity Contamination

Commingled Commercial Recyclables Processing (May/June 2002)

Out-throws, Prohibitives and Total Contamination for Each Commodity Sampled (Average Percentages for All Samples in the Study at All Facilities)

Key:
OCC = Old Corrugated Cardboard
MSP/MOP = Mixed scrap paper, mixed office paper (see definitions in report)
ONP = Old Newspaper
Paperboard = Non-corrugated groundwood packaging, e.g., cereal boxes, six pack holders
Office Pack = Typically higher in ledger, lower in ONP than MSP/MOP.
Out-throw = Non-fiber recyclable misplaced in the wrong commodity; will be disposed by end-use markets.
Prohibitive = Non-recyclable material, such as dirt, putrescibles and items without recycling markets.
Total Contamination = Percentage of each commodity consisting of out-throws and prohibitives.

Commodity (No. Samples)	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Out-Throw Subtotal	Prohibi-tives	Total Contam.
OCC (N:52)	0.10%	0.10%	0.11%	0.08%	**0.31%**	**2.61%**	**2.9%**
ONP#6 (N:39)	0.11%	0.57%	0.10%	0.40%	**1.18%**	**2.10%**	**3.3%**
ONP#7 (N:16)	0.02%	0.20%	0.08%	0.17%	**0.48%**	**0.68%**	**1.2%**
White Ledger (N:26)	0.00%	0.07%	0.03%	0.01%	**0.11%**	**0.42%**	**0.5%**
Office Pack #1 (N:6)	0.00%	0.00%	0.01%	0.02%	**0.03%**	**0.90%**	**0.9%**
Office Pack #2 (N:4)	0.00%	0.00%	0.01%	0.08%	**0.09%**	**1.00%**	**1.1%**
MSP/MOP (N:34) **	0.15%	0.63%	0.14%	0.38%	**1.31%**	**4.88%**	**6.2%**
Paperboard/OCC Mix (N:11)	0.11%	0.06%	0.09%	0.16%	**0.42%**	**2.03%**	**2.45%**

** Three of five processors that produced this fiber grade were reloading this grade for additional sorting to another processor. Thus, it is likely, but not assured, that the levels of out-throws and prohibitives reported in the samples of this fiber grade would be reduced after the additional sort by the second processors.

Table ES-2: Commodity Contamination by Source and Mixture Processed

Commingled Commercial Recyclables Processing (May/June 2002)

Percentages of Out-Throws and Prohibitives in Fiber Commodities,
Segregated by Source and Mixture of Material Processed
(Averages; Facilities Indicated That Handle Each Type of Source/Mixture)

Key: Com. = Commercial source only.
Com/Res = Mixed commercial and residential material.
Fibers Only = Mixture of multiple types of paper fibers; container content incidental.
Fiber/TAP = Mixture of paper fibers and Tin/Aluminum/Plastic containers; only incidental Glass.
Single Stream = Mixture of Fibers, TAP and Glass; typically delivered as reload from other facilities.
Commodities: All sorted, market-ready fiber, including OCC, ONP#6, ONP#7, Mixed Office Paper,
Mixed Scrap Paper (MSP), White Ledger, and Mixed Paperboard/OCC, plus hand-sorted garbage (residue)
Hand-sorted garbage = Material removed from loads by workers, not mechanically screened.
Fiber & Fiber/TAP = Samples at some facilities were taken from different sources and mixtures.
Total Contamination = Percent of commodities consisting of out-throws and prohibitives.
Reloads MSP = Two facilities ship partly sorted mixed scrap paper to another processor.

Source, Mixture (No. of Facilities)	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Out-Throw Subtotal	Prohibi - tives	Total Contam.	Comments
All Fiber Samples (All 8 Facilities)	0.06%	0.29%	0.09%	0.20%	**0.65%**	**2.33%**	**3.0%**	
Commercial Fiber (3)	0.03%	0.01%	0.06%	0.02%	**0.12%**	**1.28%**	**1.4%**	
Commercial Fiber (1)	0.11%	0.10%	0.09%	0.20%	**0.50%**	**3.79%**	**4.3%**	Reloads MSP
Com/Res Fiber & Fiber/TAP (1)	0.01%	0.22%	0.14%	0.16%	**0.52%**	**1.97%**	**2.5%**	
Com. Fiber & Com/Res, Fiber/TAP (1)	0.05%	0.06%	0.04%	0.13%	**0.27%**	**2.06%**	**2.3%**	Reloads MSP
Commercial Fiber/TAP (1)	0.07%	0.87%	0.15%	0.36%	**1.45%**	**3.42%**	**4.9%**	Reloads MSP
Com/Res Single Stream (1)	0.14%	0.82%	0.11%	0.55%	**1.62%**	**2.35%**	**4.0%**	Sorts reloads

Section I. INTRODUCTION

A. Study Purpose and Background

Purpose. Metro's Department of Regional Environmental Management initiated this study of commingled recycling processors in the region to help decide whether and how best to promote commingling of commercial recyclables.

Background. Almost all residential recyclables in the Metro region are collected commingled, either as a two-sort (fibers mixed with metal and plastic containers, and glass separate) or three-sort (fibers, metal/plastic containers, and glass). About one-third of all commercial materials are collected in one of these mixtures, and the trend is increasing rapidly.

Haulers and ratepayers like commingling because it offers convenience and because it controls collection costs by improving vehicle and crew efficiencies (less curbside sorting, less off-route time to unload).

Local government supports commingling because it increases recovery.

Processors either adapt their systems to handle commingled materials or focus on materials that present fewer challenges, such as fibers only.

Markets and environmental groups challenge commingling because it lowers the quality of recycled feedstock and may result in greater losses of source-separated recyclables.

Metro and local governments must determine the capacity and capability of the infrastructure to handle increasing mixtures of fibers and containers, the quality of its performance with these mixtures, and the integrity of the recovery system as a whole.

Objectives. This study was designed to answer the following questions:

1. Does the Metro region have the processing capacity and capability to handle more tons of mixed paper fibers and fibers/TAP (all fibers mixed with tin, aluminum and plastic containers)?

2. Does the region have the processing capacity and capability to handle single-stream mixtures (all fibers mixed with all containers, including glass)?

3. To what extent, and due to what practices, are collected recyclables lost through processing by inclusion in the wrong commodities (e.g., plastic or metal in paper fibers)?

4. To what extent are recyclable materials lost through inclusion in processor garbage?

5. How are processors and fiber end-use markets responding to the increasing extent of mixed-recyclables collection in the Metro region?

6. What messages should local governments and Metro convey to generators, collectors, and processors about the mixing of recyclable materials at each stage of recovery?

Study efforts. Metro addressed these questions with three research and analysis efforts:

1. A processor study sampled commodities and garbage sorted from commingled materials at eight facilities, to quantify misplaced recyclables that would be disposed. This study also observed processing operations and interviewed processing staff to better understand the causes of sampling results.

2. A survey of end-use markets provided information about actions, plans and concerns among the manufacturers that buy commodities sorted from commingled materials.

3. Calculation of recycling tons collected commingled and separately in the Metro region helped put sampling data in perspective by establishing the current and potential impacts of material mixtures.

Caveat. The results of this study represent a snapshot in time of materials, markets, processor capabilities and practices, all of which are changing. Material combinations are changing throughout the region, for the convenience of collectors and generators. Some changes in collection and processing occur as mills change their products, requirements and capabilities.

Market affiliations are changing as well. During the short duration of the sampling study (May and June 2002), several processors found different markets for some of their commodities. During preparation of this report, processors continued to change what they sort and to whom they sell.

Also, processors are changing their sorting equipment. Three facilities installed new, automated systems during the last year, and two of them did so within three months of the sampling study. Due to the complexity of this equipment, the first months of operation involve adjustments and tweaking until the optimal mix of speed and quality product result. One facility that participated in this study will move into a more automated operation in a few months.

In sum, the processing situation is in flux.

B. Methodology

The processor study provided the central data for this report. It evaluated the out-throw and prohibitive content of commodities produced from commingled recyclables by processors in the tri-county Metro region. This study also relates results to material sources and mixtures and to processor methods. Metro staff worked with a consulting firm, Environmental Practices, to design the sampling protocol, which the consultant conducted. Metro staff and the consultant

observed processing operations and interviewed processing facility staff. Metro and Oregon Department of Environmental Quality staff further analyzed and interpreted sampling data and interviewed end-use markets (paper mills).

Principal tasks. Metro identified eight processing facilities that, together, are estimated to handle about 90 percent of the mixed, source-separated commercial recyclables collected in the region. Metro contracted with Environmental Practices LLC, a Portland-based consulting firm, to perform the following tasks: (See subsection *C. Definitions and Assumptions,* for terms requiring explanation.)

1. Describe processing methods, equipment, staffing and schedules at each facility.

2. Sample fiber commodities and hand-sorted garbage that each processor produces from mixtures of commercial-source recyclables.

3. Sort, weigh and calculate percentages of different fiber grades found in the commodity samples.

4. Sort, weigh and calculate percentages of out-throws found in fiber commodities. For the purposes of this study, "out-throws" are non-fiber recyclables such as metal cans, plastic bottles and glass that will be disposed by fiber end-use markets.

5. Sort, weigh and calculate percentages of prohibitives found in fiber commodities. "Prohibitives" are non-recyclable items, such as dirt, putrescibles, coated cardboard and certain types of plastics.

6. Sort, weigh and calculate the percentages of out-throws and prohibitives found in hand-sorted garbage, to establish levels of recyclables improperly disposed. "Hand-sorted garbage" is material workers remove for disposal.

7. Examine and characterize in a general way the contents of non-fiber commodities prepared for market from commingled commercial recyclables. These non-fiber commodities include aluminum cans, steel cans, plastic containers, plastic film and glass.

8. Characterize generally the contents of screened "fines" that will be disposed.

9. Acquire end-use market information, including whether sampled commodities will be exported or used domestically, and what products will be made from them.

10. Relate findings about percentages of out-throws and prohibitives to the following:
    - material source (commercial only, commercial/residential blend);
    - type of mixture (fibers only, fibers and metal/plastic containers, fibers and all containers including glass);
    - processing practices, including type and configuration of equipment, sorting sequence, number of workers.

11. Provide an overview of capacity and capability of these facilities to serve the region.

Processor selection. The eight participating processors were chosen because each handles commingled material from commercial generators within the Metro region. As a group they handle most such material collected in the region. A number of seemingly obvious candidates turned out not to handle significant quantities of this material, at least not during the study period. Most of the participating processors also accept residential collections, but the one's that don't are important and instructive.

Preparation and observation. The study team interviewed each processor to determine quantities, sources and mixtures of incoming feedstock and outgoing commodities and residues (garbage), along with market destinations. The study team also identified how these processors receive, store and handle different materials, including whether they segregate non-fiber recyclables from fibers, and whether they mix commercial and residential loads at their facility. Over the period of the study, the team observed and recorded processing techniques at each facility, including floor plans, staffing, material flows and mechanical processes. A synopsis of these descriptions is included in Section V, "Processing Strategies and Operations." The processor data form used for this study is attached in Appendix A.

Sampling standards. The criteria for the commodities to be sampled required that all or some of the commodity must:

1. Originate with a commercial generator.

2. Represent a post-consumer stream.

3. Arrive as part of a commingled load.

Effort was made to ensure that the source of sampled commodities was entirely commercial or at least included commercial loads. Some processors keep commercial materials segregated from residential; others do not. Some collection routes include both commercial and residential customers.

No samples were taken of commodities produced from "pure" materials, such as unsold magazines or compactor loads of corrugated cardboard or trimmings from fiber product manufacturers and publishers.

Sampling the commodities on three different days during the study period provided a good statistical overview of each processor. Ideally, the three visits were to occur on three different days of the week to add as much variety to the sampling as possible. Two of the eight participants handle only commingled commercial fibers and receive a fairly consistent supply; for this reason and because of logistics (sampling schedule and the willingness/ability of these processors to harbor a study team), it was decided to visit those two processors only once.

The sampling goal was to complete 12 samples of 150 pounds each per visit. These samples were to be divided between marketed commodities and hand-sorted garbage. The sampling

focused on the principal fiber commodities each facility produced. Various paper grades comprise at least 90% of tons recycled in the Metro region. Highest priority was given to materials that were graded and ready for market. Materials that were to be sent out for resort received a lower priority (and thus, fewer samples), because specifications for a presort mix do not exist.

During the design phase of this study, the desired sample size was set at 150 pounds. This targeted weight was to apply to all commodities. After evaluation in the field, that ideal sample weight was adjusted for one of the materials. Some of the mixed waste paper grades consisted of small pieces of paper. The size of each piece was small enough and light enough to create a heterogeneous mix in a small amount of paper. It was determined that a smaller sample size, usually under 100 pounds, was sufficient for adequate characterization of mixed waste paper.

All remaining material samples weighed a minimum of 125 pounds each. They were taken at various times throughout the processing and at various places within the pile of material. The average weight of all samples taken in this study is 147 pounds.

Garbage. Processors remove unwanted contaminants from processed materials in two ways:

1. Hand-sorted garbage. The hand-sorted garbage that this study evaluated usually consisted of the entire amount that workers removed from the sorting lines during the observed time window (a full day, normally). These garbage samples occasionally weighed less than 150 pounds. Such small quantities suggest that hand-sorted garbage as a percentage of all material sorted is small, which mitigates the importance of the fact that, averaged across all facilities, almost half of hand-sorted garbage consisted of recyclable fibers and non-fibers.

2. Screened fines. Half the studied facilities use automated screens that remove smaller fragments from material passing along the sort line. Three of these screens were at facilities that sort fiber/container mixtures. These processors dispose their screened fines, which consist mostly of recyclable glass, metal, plastic and paper. It was not possible within the scope and time frame of this study to sample screened fines or to weigh them as a percentage of material sorted. Lack of data on these fines must be considered a shortcoming of this study in estimating recyclable materials lost during processing. Screened fines appeared to exceed the amount of hand-sorted garbage at several processing facilities.

Sorting categories. All samples, both commodities and residue, were sorted into the following categories:

- **OCC** – old corrugated containers (cardboard); includes brown kraft paper, bags, and all corrugated fiber.
- **ONP** – old newspaper; includes all newspapers and any standard newspaper inserts.
- **Magazines** – includes all clay-coated paper publications, both glue bound and stapled.
- **Paperboard** – includes all grayboard, carrier board, boxboard.
- **Groundwood** – includes egg cartons, phone books and construction paper; technically, OCC and ONP are groundwood, but this category is used to improve analysis of commodity contents.

- **Mixed scrap paper (MSP)** – when "MSP" is used as a component of any other commodity in this study, it includes all papers that do not belong to the above categories; junk mail and ledger papers are the chief ingredients of MSP. When used as the name of a commodity in this report, "mixed scrap saper" may include *all* fiber categories in proportions that vary with the processor.
- **Plastic bottles** – includes all rigid plastic containers with a screw top or a neck.
- **Plastic film** – includes all polyethylene and polypropylene film bags and shrink wrap, but does not include more "crinkly" food sealant wrapping, such as cookie packaging.
- **Metal** – includes aluminum and tin-coated steel cans and scrap metal of various types.
- **Glass** – includes all bottles and jars, broken or whole.
- **Fines** – when applied to commodity sampling, includes pieces smaller than 1 inch that remain after sorting, including shredded paper, dirt, bits of metal and plastic and glass shards. "Fines," when applied to material screened off a sorting line, can include larger fragments.
- **Prohibitives** – includes all materials not listed above; typically, rocks, dirt, putrescibles, foam plastics, waxed corrugated cardboard, multi-material items and other non-recyclable objects.

For white ledger samples, two additional categories were used:

- **White ledger** – consists of bond and writing paper that is white with less than 50% surface printed.
- **Colored ledger** – consists of bond and writing paper that is more than 50% surface dyed or printed.

The study team sorted each sample into the above categories, weighed each subcategory and recorded the data on a form created for this purpose. Sorting and weighing were accomplished using two sizes of containers and scales. Small containers (4-gallon buckets) were used to hold materials present in smaller amounts, and were weighed using a scale with a 25-pound capacity that read in 2-ounce increments. Larger amounts of materials were sorted into 32-gallon containers that were weighed on a larger scale (100-pound capacity, +/-0.25 pounds). In both cases, the scales were tared to the empty weight of the container used for that scale, so that the weight of the contents could be read directly from the scale. The completed field data sheets are stored at the consultant's office. The data are recorded in an Excel spreadsheet. Each sample has a unique number but does not have the location as part of its identifier. The results of each sample are presented in the appendix.

Non-fiber commodities. The study team characterized but did not sample non-fiber commodities sorted from commingled materials and prepared for end-use markets. Non-fiber commodities include metal cans, plastic and glass containers, and plastic film.

Weighting of sample results. Presentation of out-throw and prohibitive results for the sampling study have not been weighted with regard to the percentage of the region's material each processor handles nor on the amount of their material sampled in this study. These results focus on patterns related to material source and mixture, and to processor method and business structure. However, in estimating potential regional losses of misplaced recyclables implied by

these results, Metro and DEQ have used weights based on hauler and processor reports of materials delivered and sold. (See Section VII, "Implications and Recommendations.")

C. Definitions and Assumptions

Commercial/Residential. This report focuses on processing of curbside recyclable materials from commercial generators, but unavoidably includes residential loads. "Commercial" materials come from all types of businesses and institutions (schools, governments), as well as from multi-family complexes larger than four units, but do not include manufacturing process waste or construction and demolition debris. "Residential" materials are set out by individual households. Some collection companies run routes that are exclusively commercial, but others mix commercial and residential materials on the same vehicle. Some processors keep commercial-source material separate from residential, and some do not. Local governments do not allow glass to be mixed with fiber on residential routes, but this practice is not regulated for commercial routes. The consultant team noted whether the commodity sampled was produced from strictly *commercial* sources or from a *commercial/residential* mixture. The team avoided sampling purely residential materials, but could not establish percentages of residential vs. commercial in processed mixtures.

Commodities. Commodities are materials that processors sort from mixtures of fibers (paper) and containers (plastic, metal and glass) and sell to end-use markets, which use them to make new products. Examples of commodities include newspaper, corrugated cardboard, white ledger, mixed scrap paper, glass or plastic bottles/jars, and aluminum or tin/steel cans. (See also definition of "grade", below.)

Contamination. This word refers exclusively to the combined out-throws (misplaced recyclables) and prohibitives (non-recyclables) in fiber commodities prepared for end-use markets.

Fiber. The word "fiber" in this study means paper, which is made principally from wood or other vegetable fiber. This report uses "fiber" to refer either to a collected mixture of paper types such as cardboard, newspaper, magazines and office papers, or to the commodities sorted from that mixture. This study focuses almost entirely on fiber commodities, which comprise more than 90% of materials that businesses and households source separate for curbside collection.

Garbage. Garbage is what a processing facility throws away (disposes), after removing it from source-separated loads. Workers remove some garbage by hand, and screens remove a mixture of small fragments from which, at this time, recyclable items cannot be extracted. Ideally, garbage would include only "prohibitives" (see below). In fact, about half of all processor garbage—more at some facilities—consists of recyclables. When the word "residue" appears in this report, it is a synonym for garbage.

Grade. Processors and end-use markets sometimes refer to different fiber commodities as "grades," but this study uses "grade" to distinguish commodities that have the same basic name but different percentages of fiber types (e.g., ONP #6, ONP #7, Office Pack #1, Office Pack #2).

For example, ONP #8 is nearly 100% newspaper, but ONP #6 in this study averaged less than 50% newspaper, with quantities of magazines, ledger (letter or copy paper) and as much as 10% cardboard/paperboard. ONP #7 falls in between these two grades. (See tables in *Appendix B, Fiber Commodity Profiles* and *Appendix C, Fiber Commodity Sampling Results*, for content differences between grades.)

Market. "Market" or "end-use market" in this report refers almost exclusively to mills that buy fiber commodities prepared from source-separated recyclables for use in making paper products such as newsprint, tissue and corrugated cardboard containers. This report makes minimal reference to markets for plastic, metal and glass.

Mixtures. This study did not sample commodities produced from pure loads of a single fiber commodity, such as corrugated cardboard, unsold magazines or post-industrial trimmings. It evaluated only the results of processing post-consumer mixtures of multiple fiber grades or of fibers and containers. The study also did not sample commodities sorted from mixed bottles and cans, although it characterized contents and markets for the sorted containers. The mixtures in this study are labeled (a) "fiber" when collected and delivered separately from containers; (b) "fiber/TAP" when the load includes fibers and tin/aluminum/plastic containers; and (c) "single stream" when the load includes not only fiber and TAP but more-than-incidental quantities of glass.

Negative sort. Material that runs off the end of a sorting line after other commodities have been removed is called "negatively sorted." A number of processors in this study pull more valuable paper grades and garbage off the sorting line and allow mixed scrap paper or ONP #6 to run off the end. Negatively sorted material tends to have higher levels of "out-throws" and "prohibitives" [see definitions, below], and some processors reload it for further sorting elsewhere. At one processing facility, a disposable mixture of broken glass, shredded paper, bits of plastic, metal and dirt runs off the end of a sort line after workers remove other materials.

Non-fiber. This study refers only to *recyclable* glass, plastic and metal containers, including plastic film, as "non-fibers" and sometimes as "non-fiber recyclables." Non-fiber recyclables may be found in fiber commodities or in processor garbage, where they are distinguished from fiber recyclables and non-recyclable "prohibitives."

Out-throws. For the purposes of this study, "out-throws" are non-fiber *recyclables* such as metal cans, plastic bottles and glass that are included in fiber commodities, from which end-use markets will remove and dispose them. These same materials in processor garbage are called "non-fiber recyclables."

Positive sort. When workers remove a specific material from a mixed load moving down a conveyor line, it is called a positive sort. Typical positive sorts include corrugated cardboard, ledger paper, higher grades of newspaper, TAP containers and garbage.

Processor. The words "processor" and "facility" may appear to be used interchangeably. A processor is the business entity that accepts source-separated recyclables and prepares them for sale to end-use markets. A facility is the actual operating site where the processing takes place.

Prohibitives. Prohibitives includes materials that cannot be recycled by any available end-market. Prohibitives include rocks, dirt, putrescibles, coated cardboard, some plastics, and multiple materials bonded together, such as fiber with plastic. The quantity of prohibitives in a commodity affects the market value of the commodity and increases costs and problems for the end market. The percentage of prohibitives in garbage means that the remaining material disposed is recyclable; 55 percent of all "garbage" in this study consisted of actual prohibitives.

Recyclable. This term refers to materials that the processors in this study can prepare for sale to end-use markets. Other materials, such as window glass and foam plastic, may be "recyclable" under certain conditions, but not as defined for purposes of this study.

Source. (See also, "Commercial/Residential," above.) Tables in this report use "source" or "material source" as a column heading to identify whether samples came from commercial or a mixture of commercial and residential loads.

TAP. An acronym for tin/aluminum/plastic, a mixture of tin or aluminum cans, scrap metal and plastic bottles often collected mixed with each other and sometimes mixed with fibers.

D. Overview of Processing System

The processors in the Portland Metro region vary greatly in size, technology, capacity, incoming mix, and salable commodities. This variation offered considerable breadth to this study. The following is an overview of issues and findings gleaned from this study.

1. Control of collection can improve processing results.

- The five processors that work most closely with collectors to control the incoming stream generate the least amount of waste and create some of the cleaner commodities.
- Two of these processors collect most of their own materials and attempt to limit their intake to commercial fibers only.
- The other three processors do some of their own collection, emphasizing commercial fibers, but they also handle fiber/container mixtures from their own and other collectors.
- Communication and common interest with the collectors helps these processors control loads and keep mixtures separate from fibers-only and containers-only materials.

2. Containers aren't priorities to some processors or haulers.

- Bottles, cans and plastic bags comprise the "lost" recyclables misplaced in garbage or in fiber commodities.
- Processors are sustained by selling fibers, which account for about 90% of all material recovered in the Metro region.
- Keeping containers out of the fiber is a strategy that processors accomplish by refusing them or by keeping them segregated from fibers. The cleanest commodities are produced at facilities that avoid containers, sort them on separate lines from fiber, or send them to other facilities.

- Some processor/collector alliances may be limiting opportunities to retrieve and recycle containers from the generator streams they serve.
- A few businesses that source separate large quantities of desirable fiber have insisted that fiber-only processors also accept containers, i.e., plastic bottles that grocery stores collect from the public as a take-back service, or cans and bottles from cafeterias in large office buildings and institutions. At the time of this study, fibers-only processors take source-separated containers to other processors but landfill containers they remove from fibers.

3. Screened recyclables are disposed.

- Three processors that accept extensively mixed material produce a screened residue with a high percentage of recyclable material, a mixture mostly of glass and shredded paper, with minor amounts of metal, plastic and prohibitives.
- No processor in the region has succeeded in recovering these screened mixtures for recycling.
- The amount of screened material being landfilled was not documented for this study due to the processors' stated intent to reprocess it for market. Processing improvements were not successful by the end of the study, and this material is still being landfilled several months later.
- All three processors are looking into air knife or vacuum systems to retrieve fiber from their screened mix. It is questionable whether any available technology will remove enough paper, metal, plastic and prohibitives to allow marketing of the glass at a cost less than disposing it.

4. Mechanical automated processing systems have increased rapidly in the past year.

- Four processors during the past year have invested in extensive new automated mechanical sorting systems. This equipment gives them an advantage in competing for commingled materials and in being able to afford sorting them.
- Automation reduces the number of operating shifts and therefore the labor costs required to sort complex mixtures. Capital investments also offer tax advantages over worker wages, benefits and insurance.
- New equipment involves ongoing adjustments to optimize both the quality and cost of the output.
- Some processors run their new lines at speeds that decrease worker ability to remove out-throws, thus increasing the loss of recyclables—but speed may be essential for business profitability.
- The screens used by processors break glass and separate out the small pieces of glass with the small pieces of shredded paper. The glass becomes a lost recyclable in screen fines or a contaminant in other commodities because neither processors nor glass markets currently have the means to economically separate the shredded fiber from the broken glass. Fiber mills consider glass a major concern when mixed with fiber commodities.
- When shredded fiber goes to a secondary processor, the small fragments make for a difficult, expensive and not fully successful sort, with some loss of recovery. Mills are increasingly citing operational concerns about dust from the higher levels of shredded paper that are present in fiber commodities. The percentage of shredded paper in Mixed Office Paper is a factor in the scrap price paid by the mill.
- Automated optical sorting technology was not evaluated in this study.

5. **Things keep changing.** Most of the studied facilities are in transition in one way or another.
   - One processor will move into an automated facility within a few months.
   - Three processors continue to adjust their new, complex equipment to their material streams and end-use markets. Other than their unsuccessful efforts to recover more of the screened residues, these three processors appear to have their systems running smoothly, considering the short length of time they've been operational.

6. **Two problem materials were identified.**
   - Finely shredded paper found at most facilities creates problems. This shred can be contained only when bagged. It is small enough, approximately 1/8-inch by ¼-inch, that it "falls through the cracks" at processors and at mills; it also ends up in screened residues and in the air at facilities. According to two processors, the occurrence of this material is increasing.
   - The second material of concern looks like fanfold computer paper; but it is made of Tyvek, a polyethylene plastic. The extent of this material's use is not known, but it is a fiber contaminant that is not easily identified and thus not easily separated.

Section II. FIBER COMMODITY SAMPLING ANALYSIS

A. Overview

The sampling study targeted fiber commodities, which account for about 90% of commercial and residential materials recovered in the Metro region. All eight processors participating in the study accept various mixes of fibers and/or fibers with containers, and sort out commodities for market.

This section discusses how out-throw and prohibitive levels for different commodities relate to material sources, mixtures and processing systems. ***Table II.A, Out-throws, Prohibitives and Total Contamination for Each Source and Mixture Processed***, presents average non-fiber contamination levels according to the material source (commercial, residential or both) and mixture processed (fibers only, fiber/TAP or single stream). ***Table II.B, Out-throws, Prohibitives and Total Contamination for Each Commodity, by Facility*** shows how contamination data vary for each commodity processed, according to the facility, source and mixture.

Appendix B, "Fiber Commodity Sampling Data," presents the following data that support the analysis in this section:

1. Commodity profiles that include contents, sources, markets and Paper Stock Institute (PS) specifications for each commodity sampled.

2. Statistical significance of differences between out-throw and prohibitive levels for all fiber commodity samples in the study.

3. Statistical significance of differences between out-throw and prohibitive levels for each facility producing each fiber commodity.

B. Analysis of Differences

Out-throw and prohibitive levels for fiber commodities correlate with different material sources, mixtures and processing systems. Tables II.A and II.B illustrate the analyses below.

1. The cleanest commodities are produced from the simplest mixtures.

- Commercial fibers only. Facilities that accept only commercial fibers, or that segregate commercial fibers from other mixtures, produce the lowest rates of out-throws (0.12% average for Processors A, E and H, whose sample commodities were made from commercial fibers only).
- Negatively sorted reload. Processor G also sorts commercial fibers, but produces a negatively sorted mixed waste paper that it ships (reloads) to another processor. Any containers present in Processor G's commercial fiber loads are not removed; this mixed

waste paper has an out-throw rate of 0.76% and a prohibitive level of 5.9%. (See Table II.B.) Processor G's out-throw rate for all sampled fiber grades is 0.5%. (See Table II.A.)

- Containers segregated. Processors C and D sort some commercial/residential fiber/TAP mixtures, but keep all or most containers separate from fibers, either on a dedicated line or by sending them off-site. These two processors have among the lower out-throw rates (0.27% and 0.52%). All six of these "cleanest" facilities avoid or segregate containers (metal, plastic, glass) from fibers to a greater extent than Facilities B and F, which have the highest average out-throw rates.
- Sampling factors. Samples from Processors C and D may have been skewed toward the lower end of contamination findings, because some samples at these facilities were taken from commercial loads and some from commercial/residential mixtures.

2. **Collector motivation appears to be the key to load control and clean commodities.**
   - Collector/processor alliances. All six of the processors with the lowest out-throw rates have co-ownership relationships with at least some of their collectors, and two of three "cleanest" facilities get their materials almost exclusively from their own fleets. This mutual interest probably helps with communication and improves control of delivered loads. This correlation speaks as much to the importance of collector decisions as it does to the business advantages of owning a fleet of trucks.

3. **The highest levels of out-throws and prohibitives are found in commodities produced from the most complex mixtures—due in part to the common strategies for highly mixed materials: automation and the production of low-grade, negatively sorted fiber commodities.**
   - Single stream. The highest rate of non-fiber recyclables in commodities (1.6%) was found at Processor F, which sorts a single stream made up mostly of residential fiber/TAP and notable quantities of broken glass. Much of this single stream material comes from other processors, including some from out of the region, that reload ship it to Processor F. Processor F uses highly automated equipment.
   - Multi-family loads. Processor B's commercial fiber/TAP mixture has more than incidental glass, owing in part to the presence of multi-family loads, which have high quantities of containers. Processor B had the second-highest rates of prohibitives and out-throws in the study (1.45% and 3.42% for a total contamination level of 4.9%). This facility uses high-speed automated sort lines and ships negatively sorted mixed scrap paper to another processor for further high-grading.
   - Sampling factors. Processor C produces a relatively low out-throw rate (0.27%) from a commercial/residential, fiber/TAP mix. Some samples from this facility were commercial only, some a mixture of commercial/residential. This facility has minimal automation and the largest number of sorting workers in the study, including long-term employees. Processor C does some of its own collection and exercises control over its loads through long-term relationships with its other suppliers. To a large extent, Processor C also segregates containers from fibers. This processor will soon go highly automated, and its out-throw and prohibitive levels may change.

4. **Positive sorts produce cleaner commodities than negative sorts.**
   - Sorting for value. Materials pulled off the line intentionally (cardboard, ledger, higher grades of newspaper) have lower percentages of out-throws than commodities that run off the end of the line (mixed scrap paper, ONP#6.) Positively sorted fibers tend to be the higher value grades, whose markets are least tolerant of contamination.

5. **New, extensive, high-speed automated mechanical sorting equipment is more closely correlated with higher out-throw and prohibitive levels than with slower, low-tech, more labor-intensive approaches.**
   - Reducing labor costs. Automation, including screens, reduces labor costs by reducing the number of shifts (and therefore the number of workers) needed to sort large volumes of mixed material. Capital investments also have tax advantages over worker wages and benefits. Such savings may improve the business viability of processors that have to deal with complex mixtures.
   - Investing in commingling. The automation investment is intended to improve economics and market share for processors that see highly mixed materials as the future of recycling, or as their only choice of supply.
   - Cash flow needs. The trend in collection is toward more complex mixtures, such as fiber/TAP and single stream. To respond to this trend, processors have made the capital investments in automated processing equipment to handle these complex mixtures. The need to generate cash flow to pay off these capital investments motivates processors to pursue these less expensive complex mixtures rather than the more expensive cleaner mixtures, such as single fiber or commingled fiber grades.

6. **Many fiber commodities sorted from more complex mixtures no longer meet published industry specifications for those grades.**
   - Contamination. Paper Stock Institute specifications limit the percent of out-throws, prohibitives and excluded fiber for all fiber commodities. In Appendix B, commodity profiles show that study samples often fail to meet industry standards. Individual processors do meet published standards, especially for positively sorted grades. (See Appendix D, Processor Profiles.)
   - Fiber-only mixtures. Commodities produced from fiber-only loads (ledger, office paper) consistently meet published standards.
   - Proprietary agreements. Processors that handle mixed loads typically have developed agreements with mills regarding price, contamination levels and allowable types of fiber.
   - Reload standards. There are no industry standards for reloaded, partially sorted fiber grades.

7. **Out-throws and prohibitives in commodity samples average 3 percent across this study.**
   - Commodity losses. Out-throws and prohibitives will be disposed at end-use markets.
   - Study average. Out-throws average 0.65% and prohibitives average 2.33%.
   - Regional projection. Using weighted study data, the regional out-throw percentage is 1% and prohibitive levels exceed 3% for commingled processing. Mixed scrap paper, newspaper and OCC, the grades with the highest out-throw and prohibitive rates in this study are recovered in much larger quantities regionally than the cleaner white ledger and office paper grades.

- Recovery rate. Regional recovery rates do not currently take these processing losses into account. Section VI, "Implications of Study Findings," estimates that current losses from commingled recyclables amount to 0.25 percentage points out of the 45% Metro region recovery rate.
- Legal issue. Disposal of source-separated recyclables is against State law.

8. Facilities that accept only fiber typically dispose of all non-fiber commodities that show up in their delivered loads.

- Containers not sorted. Even facilities that also process some fiber/TAP mixtures tend to dispose glass, metal and plastic containers when these items show up in fiber-only loads. During fiber-only runs, these facilities do not dedicate workers or receptacles to recover containers.

Table IIA: Commodity Contamination by Source and Mixture Processed

Commingled Commercial Recyclables Processing (May/June 2002)

Percentages of Out-Throws and Prohibitives in Fiber Commodities,
Segregated by Source and Mixture of Material Processed
(Averages; Facilities Indicated That Handle Each Type of Source/Mixture)

Key: Com. = Commercial source only.
Com/Res = Mixed commercial and residential material.
Fibers Only = Mixture of multiple types of paper fibers; container content incidental.
Fiber/TAP = Mixture of paper fibers and Tin/Aluminum/Plastic containers; only incidental Glass.
Single Stream = Mixture of Fibers, TAP and Glass; typically delivered as reload from other facilities.
Commodities = All sorted, market-ready fiber, including OCC, ONP#6, ONP#7, Mixed Office Paper, Mixed Scrap Paper (MSP), White Ledger, and Mixed Paperboard/OCC, plus hand-sorted garbage (residue.)
Hand-sorted garbage = Material removed from loads by workers, not mechanically screened.
Fiber & Fiber/TAP = Samples at some facilities were taken from different sources and mixtures.
Total Contamination = Percent of commodities consisting of out-throws and prohibitives.
Reloads MSP = Two facilities ship partly sorted mixed scrap paper to another processor.

Source, Mixture (Facility Code Letter)	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Out-Throw Subtotal	Prohibi-tives	Total Contam.	Comments
All Fiber Samples (All 8 Facilities)	0.06%	0.29%	0.09%	0.20%	**0.65%**	**2.33%**	**3.0%**	
Commercial Fiber (A,E,H)	0.03%	0.01%	0.06%	0.02%	**0.12%**	**1.28%**	**1.4%**	
Commercial Fiber (G)	0.11%	0.10%	0.09%	0.20%	**0.50%**	**3.79%**	**4.3%**	Reloads MSP
Com/Res Fiber & Fiber/TAP (D)	0.01%	0.22%	0.14%	0.16%	**0.52%**	**1.97%**	**2.5%**	
Com. Fiber & Com/Res, Fiber/TAP (C)	0.05%	0.06%	0.04%	0.13%	**0.27%**	**2.06%**	**2.3%**	Reloads MSP
Commercial Fiber/TAP (B)	0.07%	0.87%	0.15%	0.36%	**1.45%**	**3.42%**	**4.9%**	Reloads MSP
Com/Res Single Stream (F)	0.14%	0.82%	0.11%	0.55%	**1.62%**	**2.35%**	**4.0%**	Sorts reloads

TABLE IIB: Commodity Contamination by Facility

Commingled Commercial Recyclables Processing (May/June 2002)

Out-Throws and Prohibitives in Each Commodity Sampled for Each Facility Producing That Commodity with Source and Mixture of Material Processed (Average Percentages for All Samples at Each Facility)

Commodity	Facility (Source/Mix Processed)	Out-throw Subtotal	Prohibi-tives	Total Contam.	Comments
OCC					
	A (commercial fibers)	0.3%	2.6%	2.8%	
	B (commercial fibers/TAP)	0.2%	5.5%	5.7%	
	C (com. fibers & com/res,fibers/TAP)	0.1%	1.4%	1.5%	
	D (com/res fibers & fibers/TAP)	0.4%	1.2%	1.7%	
	E (commercial fibers)	0.2%	1.4%	1.6%	
	F (com/res single stream)	0.6%	2.2%	2.8%	Sorts reloads
	G (commercial fibers)	0.3%	3.3%	3.6%	
ONP#6					
	A (commercial fibers)	0.2%	1.4%	1.7%	
	D (com/res fibers and fibers/TAP)	0.7%	2.7%	3.4%	
	F (com/res single stream)	3.9%	2.8%	6.7%	Sorts reloads
	G (commercial fibers)	0.3%	2.0%	2.3%	
ONP#7					
	B (commercial fibers/TAP)	0.7%	0.6%	1.4%	
	C (com. fibers & com/res,fibers/TAP)	0.3%	0.7%	1.0%	
White Ledger					
	A (commercial fibers)	0.0%	0.2%	0.2%	
	D (com/res fibers & fibers/TAP)	0.3%	0.7%	0.9%	
	E (commercial fibers)	0.0%	0.9%	0.9%	
	H (commercial fibers)	0.0%	0.2%	0.2%	
Office Pack #1					
	E (commercial fibers)	0.0%	1.1%	1.1%	
	H (commercial fibers)	0.0%	0.8%	0.8%	
Office Pack #2					
	H (commercial fibers)	0.1%	1.0%	1.1%	
Mixed Scrap/Office Paper					
	B (commercial fibers/TAP)	4.5%	4.1%	8.5%	Reloads
	C (com. fibers & com/res,fibers/TAP)	0.5%	4.3%	4.8%	Reloads
	D (com/res fibers & fibers/TAP)	0.9%	4.8%	5.7%	
	E (commercial fibers)	0.2%	5.1%	5.3%	
	G (commercial fibers)	0.8%	5.9%	6.7%	Reloads
Paperboard/OCC Mix					
	B (commercial fibers/TAP)	0.6%	2.1%	2.7%	
	F (com/res single stream)	0.4%	2.0%	2.4%	Sorts reloads

Section III. NON-FIBER COMMODITIES

This section reports on the non-fiber commodities generated at each of the processors from commingled commercial and/or commercial/residential materials. Because the study focused on fiber, which comprises 90% of all recovery in the region, these non-fiber commodities were not sampled or sorted, but they were characterized visually when available.

Most facilities that accept fiber/TAP mixtures make a good effort to recover the containers and to keep them out of fiber commodities. Some facilities try to minimize delivery of fiber/container mixtures, seeking as much as possible to receive containers separate from fiber, and to sort containers separately from fibers. As stated in Section II, facilities that accept only fiber typically dispose of all non-fiber commodities that show up in their delivered loads.

Section V of this report, "Markets Assessment," lists end-use markets for the following container materials as well as for various fiber commodities.

A. Plastic bottles

Three facilities in this study positively sort plastic bottles and market them. One of these processors creates a mix of approximately 85% plastic bottles and 15% rigid plastic containers for an export market. The observed plastic bottles for these three streams were clean.

Two additional facilities transfer mixtures of TAP to another location within their companies for separation and marketing. A third facility sends mixed TAP to a secondary processor.

B. Tin/steel cans

Processor D, which handles primarily residential material, keeps containers separate from fiber and processes the containers on a line separate from fiber. The magnetic separation of tin cans works well at this processor because fiber is kept separate from containers, as much as possible.

Processor C sends a tin and plastic combination to another one of its facilities for separation. This mix of materials appeared clean, giving it a high probability of clean separation.

Processor B sends a mix of tin/steel, plastic and glass mixed with fiber to a secondary facility.

Two facilities process tin/steel cans twice due to their being mixed with fiber during the first processing.

C. Aluminum cans

Facilities B, C, D and F recover aluminum beverage cans. Facilities B and D separate the beverage cans from aluminum pet food cans, which have a non-metal coating, increasing the value of the beverage cans by a factor of four.

D. Glass containers

Processor B accepts source-separated glass. The material is tipped into an outdoor bay, and a staff person is responsible for removing any contaminants. This produces a clean mixed color-glass stream.

Processor G accepts mixed containers and has a fairly good system of mechanical and manual separation on a processing line separate from the one used for fiber. The mixed glass is clean and marketable.

Processor C reloads all of its glass containers, mixed with some fiber, to another facility it owns.

Processor F accepts materials in a single stream, although it also processes some mixed containers (glass, metal and plastic). The single stream results in a high glass content on the sort line and in the fiber commodities. Processor F sells little if any glass; the mechanics needed to remove the glass have not been refined yet. The glass-fines-fiber mix that is the negative sort from its container line is currently being landfilled.

E. Plastic film

All eight of the processors that participated in this study collect clean plastic film, bale it, and sell it locally to the same market, which makes a plastic lumber product. Plastic film commonly arrives separately bagged in mixed loads of OCC, from which workers positively sort it on the floor and on the sort line. When plastic film is not easy to recover—for example, if it is mixed with other materials on the sort line, or if it is dirty—it will be removed as garbage or will pass off the line with negatively sorted fiber commodities.

Section IV. SORTING RESIDUES

A. Hand-sorted garbage

All facilities have workers who remove unwanted materials from the sort line—unrecyclable items (for that facility at this time), such as putrescibles, foam plastics, wax-coated cardboard and multi-material products or packages (i.e., plastics bonded to paper).

The study team sampled this hand-sorted garbage at each facility, sorted it into the same component parts as fiber commodities, and recorded results. Some processors were willing to share the figures for the amount of garbage they generate monthly. This information is aggregated for all studied facilities and used in Section VII, "Implications of Study Findings," to estimate regional losses of recyclables.

Table IV, Hand-sorted Garbage by Facility, shows the recyclable and prohibitive contents of hand-sorted residues at each processor. (Additional data can be found in Appendices F and G, which include details on composition of recyclables in residue.) Some generalities can be stated based on these data and observations:

1. Restricting input to fibers only results in low quantities of garbage (Processors A and H).

2. Some processors that handle a broad range of recyclables at their facility will try to retrieve the out-throws, resulting in lower percentages of recyclable materials in the garbage (Processors C and D). Although Processor B has the lowest rate of recyclables in its hand-sorted garbage, it still has considerable screened fines and high out-throw and prohibitive rates in its commodities, which serve as something of a surrogate for the hand-sorted garbage.

3. Residues that were hand-sorted averaged 45% recyclables, both fiber and non-fiber, for all facilities in this study. Facilities averaged from 29.7% to 75.3% for amounts of prohibitives (non-recyclables) in their hand-sorted garbage. The majority of processors were in the range of 50% to 65% prohibitives, with the remainder being recyclables.

4. A large amount of the recyclable paper found in the hand-sorted garbage arrived in plastic or kraft bags. These bags were pulled as contaminants by the sorters at most facilities, but not opened for further separation. Often, workers on fast-moving sort lines have no time to open closed bags. Workers at some facilities are instructed for safety reasons not to open bags, or for commodity quality reasons to discard kraft paper and plastic.

5. If a mill has the capability to clean up the commodity, then the processor is not compelled to do so. There may be some advantage to processors in sending prohibitives out-of-region, where they often can be disposed less expensively.

Plastic film. At 11 percent, plastic film is the dominant non-fiber recyclable in hand-sorted garbage by volume. It is pulled off the sorting belt by all processors, to keep it out of fibers. The processors have a steady domestic market for this film, but it is regularly landfilled when pulled from the processing line. The main reason for disposing this material is its lack of cleanliness in this mixed-material situation. If generators bag film and add it to OCC or Office Pack as a separated commodity, then processors will pull it as a recyclable.

Metal. Metal accounted for almost 10% of hand-sorted garbage, including tin and aluminum cans and scrap metal.

Glass. Glass bottles and jars were present at almost 4% in hand-sorted garbage.

Plastic bottles. Plastic bottles occurred at an average rate of 2% in hand-sorted garbage.

Ream wrappers. Ream wrappers account for a portion of the non-recyclable fiber waste. These wrappers were present in all waste stream samples.

Fiber only. The leading factor contributing to a low quantity of hand-sorted garbage appears to be sorting fiber-only mixtures. Fiber-only mixtures also reduce the percentages of recyclables in hand-sorted garbage. Processors A and H have two of three lowest percentages of disposed recyclables.

Worker training. Processor B, with a low 25% recyclable material in its waste stream for commercial Fiber/TAP, appears to have high quantities of screened fines plus out-throws and prohibitives in its commodities. Well-trained permanent workers, however, may help reduce the percentage of recyclables in Processor B's hand-sorted garbage. Processors C and D also benefit from worker experience.

Containers separate. Keeping containers separate from fibers as much as possible also contributes to the mid-range percentages of recyclables in hand-sorted garbage for Processors C, D and G.

Multiple factors. Processor F, with more than 70% recyclable material in its hand-sorted garbage, accepts a single-stream mixture of all fibers and containers and uses temporary workers to sort it on a high-speed automated line. Loss of glass, fiber, metal and plastic off the end of the line (instead of in screened fines) wasn't measured for this operation, but it was notable. Magnets and workers recover ferrous and aluminum containers, but workers simply removed and disposed scrap metal, because Processor F had not yet arranged for a market and had not dedicated a receptacle for this metal. That situation has been remedied since the sampling period. Almost 25% of Processor F's hand-sorted garbage is fiber. Based on observation, a relatively high proportion of this fiber, compared with other processors in the study, was in paper or plastic bags, possibly collected from residential sources. If workers have no time to open these bags during processing, their contents will be lost. This processor sends fiber to its own mill, which is equipped with a pulping system designed to screen out non-fiber contaminants. A prohibitive of this mill's process is brown/kraft paper. The sorters are instructed to remove all brown, so anything inside a kraft bag is disposed.

B. Screen-sorted fines (garbage)

Four processors of the eight have screens installed to remove fragments smaller than 2 inches, which are difficult for workers to pick off the line. These "fines" include dirt, but consist mostly of mixed recyclable materials, principally glass, shredded paper, and smaller plastic and metal containers. Three of these facilities, which handle more complex material mixtures, send screen-sorted fines to a landfill. The fourth facility, a fibers-only operation, recovers mostly fiber from its screen, including minutely shredded paper, and adds this material back into lower fiber grades. It appears that rotating screens also break glass and shred some paper into smaller pieces, both of which then fall through into the fines.

Processor B produces fines from a double-decker ONP screen. These fines consist of pieces (about 1/2" or less) of dirt, fiber, plastic and metal mixed with a great deal of broken glass. Processor B attempts to minimize glass pieces by pulling bottles at the beginning of its process. The screened fines are disposed.

Processor D pulls fines in a similar fashion as B, but instead of pulling glass at the beginning of the process, this operator has a separate line for processing and separating plastic, glass and metals, via a drum screen and an air knife. These materials are brought in source separated from the fiber.

Processor F planned to resort its residues (actually negatively sorted material that runs off the end of the line, not screened but including material that would fall through screens plus larger pieces). Processor F's intention was to recover more fiber by sorting the mix of glass, shredded fiber, TAP and prohibitives a second time before landfilling the remaining mixture. Processor F's two screens sort by size to separate containers and different types/sizes of fiber for easier sorting, but the screens do not remove material from the line. Processor F is experimenting with placement of an air classifier to recover small fiber from heavier materials such as glass.

Facility H adds the fines back into its lowest grade of fiber after processing through a shaker screen (along with shredded paper from document destruction companies), because a high percentage of these fines consist of extremely small pieces of paper. The shaker screen is placed at the beginning of the sort line, resulting in a very clean stream for the sorters to pick from (whole pieces of paper, rather than small pieces to pick through.)

The four processors without screens (A, C, E, and G) carry the residues through the process where they are incorporated into the final commodity.

TABLE IV: Hand-Sorted Garbage, by Facility

Commingled Commercial Recyclables Processing (May/June 2002)

Contents of Hand-Sorted Garbage (Fiber and Non-Fiber Recyclables and Prohibitives)
for Each Facility Producing That Residue,
with Source and Mixture of Material Processed
(Average Percentages for All Samples at Each Facility)

Residue	Facility (Source/Mix Processed)	Fiber Subtotal	Nonfiber Subtotal	Recyclable Total	Prohibitives
Hand-Sorted					
	A (commercial fibers)	10.8%	24.4%	35.2%	64.8%
	B (commercial fibers/TAP)	5.8%	18.9%	24.7%	75.3%
	C (com. fibers & com/res, fibers/TAP)	25.5%	11.2%	36.7%	63.2%
	D (com/res fibers & fibers/TAP)	21.7%	19.8%	41.5%	58.6%
	E (commercial fibers)	14.6%	35.2%	49.8%	50.2%
	F (com/res single stream)	24.6%	45.7%	70.3%	29.7%
	G (commercial fibers)	10.1%	37.6%	47.7%	52.3%
	H (commercial fibers)	23.9%	4.4%	28.3%	71.7%

Section V. MARKETS ASSESSMENT

Subsection A of this markets assessment reports the findings from interviews conducted by Metro staff with domestic mill paper buyers and exports brokers. These interviews examined the markets' responses to scrap paper produced from commingled collection programs and evaluated the ability of markets to absorb more scrap paper from the Metro region. Subsection B provides an assessment of market conditions during the June 2002 study. Environmental Practices submitted this market report, which was prepared by Kent Dunn, the Markets Chair for the Association of Oregon Recyclers.

Table V at the end of this markets assessment presents a partial list of markets used by processors participating in this study, including commodities purchased and products manufactured.

A. Interviews with End-Use Markets

Interview background. Metro staff conducted 12 interviews with domestic regional fiber mill buyers and export brokers, and four interviews with processors. These interviews focused on trends in scrap paper grades (i.e., commodities) purchased, mill demand, contamination levels and anticipated operational changes. Comments are grouped according to the four major types and quantities of post-consumer scrap paper consumed by these market sectors: old newspaper (ONP), old corrugated containers (OCC), mixed scrap paper (MSP) and office pack (OP). In addition, two interviews were conducted with representatives from the glass industry to determine industry demand for mixed-color cullet.

Summary of key trends:

1. Potential fiber mill closures. Northwest domestic paper mill production across all grades appears flat and is not predicted to increase significantly in the near future. As U.S. manufacturing continues to move offshore, packaging will follow. This will bring additional pressure to shutter containerboard and boxboard plants in high-cost production areas, such as the Northwest. The recent announcement of a new tissue machine for the Northwest is at a mill that uses only small quantities of recycled fiber.

2. New fiber grade standards. One consequence of more commingled recycling collection from households and businesses is that the cleaner premium grades of scrap paper are disappearing (e.g., ONP #8, OP #1, source-separated loads of post-consumer telephone directories). Some mills are going to a greater distance to get those premium grades or, in a few instances, are cutting back their use of recycled paper. However, most mills are responding by:
   - Creating new grades (e.g., a Near White Ledger, between White Ledger and Office Pack #1).
   - Taking custom blends from processors and using them as part of an end-use product recipe.
   - Accepting fiber in a premium grade that was formerly considered an out-throw (e.g., allowing some white ledger in ONP #8).

3. New capital investment in recovered paper use. One Northwest domestic paper mill has made a substantial investment in pulping and screening equipment to be able to use more recovered paper, especially ONP and mixed scrap paper. Several other mills have invested in additional screens to be able to handle more commingled feedstock.

4. Barriers to recycled fiber use. The contribution of recycled feedstock to total mill raw material supply has decreased in the last year, in part due to lower energy and wood chip costs compared to 18

months ago and in part due to reduced availability of the cleaner grades of scrap paper. Recycled content ranges from 40% to 60% for most regional mills that use recycled paper. Despite the request of its customers to increase its recycled content above 25%, one major regional mill was unable to move upward, citing unfavorable economics and loss of available quality recycled feedstock. Nevertheless, there are market development opportunities exist to increase recycled content at some regional mills that make newsprint, tissue, and printing and writing paper.

5. Using lower fiber grades. Although total consumption of recycled feedstock may not be increasing domestically, mills are experimenting with substituting lower grades for higher grades. For example, more residential mixed paper is finding a home in newsprint mills; as a result, virtually none is exported. Also, more chipboard is going into OCC grades, which can accommodate up to 5%. Some mills and export buyers expressed concern that some Metro regional processors appear to be producing an OCC pack that contains 10% to 20% paperboard or chipboard.

6. Contamination issues with fiber. Increasing contamination is a concern for both domestic mills and export buyers. Investments in additional screening have taken care of the increasing levels of plastic, metal and other unwanted materials. A number of mills have eliminated regular quality control programs due to staff cutbacks, so they tend to respond to obvious violations of grade specifications rather than small transgressions. The most mentioned concerns were glass, small pieces of unbleachables, waxed cardboard and carrier stock, and high dust levels due to shredded or hammer-milled paper. Glass has the potential to be the most disruptive to the mills and their customers, although only a few citations of actual problems were provided in the interviews. A national study of 12 fiber mills by the American Forest & Paper Association is taking a more in-depth look at the problem and potential solutions. Mills respond to the problems of unbleachables, wax and carrier stock, and high dust levels by downgrading or rejecting loads.

7. Adequate fiber market demand. Additional recovered paper from the Metro region should have no problem finding a home. Domestic mills would use it to displace supplies from California or British Columbia, which bear higher freight costs. Freight cost becomes a larger consideration because it makes up a greater percentage of a mill's total supply cost when lower-value recycled paper grades are purchased, which provides an advantage to Metro-area processors that are close to regional mills. One Northwest regional mill has stated publicly that it would absorb all the mixed paper generated in the state of Oregon. Also, the export market would absorb additional recycled paper from the Metro region to meet the burgeoning demand from China and Mexico, especially for OCC and mixed paper.

8. Adequate mixed-color cullet demand. Demand for clean mixed-color cullet currently exceeds supply by California fiberglass manufacturers. Oregon mixed-color cullet can be economically competitive to meet this demand if the glass is collected separately from fiber. Fiber is the biggest contaminant in cullet prepared for the fiberglass markets.

Trends for recycled fiber commodities. Mill standards and the contents of processed commodities have changed in recent years, as commingled collection and economic changes have taken hold.

Old Newspapers (ONP)

1. Grades

- Paper Stock Institute (PS) grade ONP #8, with 0.25% out-throws and 0% prohibitives, has almost disappeared from the Metro region.
- Other PS ONP grade definitions are blurring. Previously, old magazines and white ledger were counted as out-throws, but now more mills are including them with ONP as acceptable fiber as part of a #8 or #7 grade.

- Every major ONP-consuming mill in the Northwest is now taking some form of a blend that includes ONP, old magazines and some fraction of ledger paper, from a residential or office mixed paper stream.

2. Demand

- Domestic regional mills dominate the Portland market with little ONP going export.
- Several regional mills report significantly increased demand for ONP. Two mills are substituting ONP, for mixed scrap paper in one case and for old telephone directories in the other case. Another mill is providing new demand as part of increased capital investment.
- At least one regional mill has cut back its use of ONP due to lower prices for energy and wood chips this year compared to 18 months ago.

3. Contamination concerns

- Unbleachable fiber from OCC, kraft bags and chipboard (e.g. gray boxboard, such as cereal boxes) is a major contaminant.
- Glass is the greatest concern to fiber markets, but only one mill has reported actual problems.
- One mill reports problems with plastic bags from processors that handle large amounts of bagged over-issue from magazine and newspaper vendors.

4. Operational changes

- One mill plans to add several more barrier screens to handle plastic bags better.

<u>Old Corrugated Containers (OCC)</u>

1. Grades

- PS Grade 11, OCC with 5% out-throws and 1% prohibitives, is the primary grade purchased by domestic mills and export markets.
- Some domestic mills are more tolerant on the amount of chipboard allowed.

2. Demand

- Domestic mills consume most of the OCC generated by the Portland area.
- As more manufacturing moves out of the U.S. to Asia and Mexico, packaging plants will follow. Export markets are seeing tremendous increase in demand in OCC, with new linerboard mills being built in China.

3. Contamination

- Glass is mentioned as a major concern, although few examples are cited.
- Many mills have had to reduce staff to be competitive, thereby eliminating quality control staff that broke bales and measured contamination by supplier.

4. Operational changes

- One mill is adding a new digester to allow it to have more flexibility in using wood chips when OCC costs get too high.

<u>Mixed Scrap Paper (MSP)</u>

1. Grades

- News-rich ("soft") mixed scrap paper, without OCC or chipboard, is being marketed to several domestic newsprint mills.
- A true mixed-paper grade with unbleachable fiber, such as chipboard still goes to export market.

2. **Demand**
   - In the last 12 months, domestic ONP mills are now absorbing all residential mixed paper from the Portland region. Previously this scrap paper had gone to the export market.
   - At least one domestic newsprint mill has cut back use of MSP by 75% in favor of cleaner ONP grades.

3. **Contamination**
   - Glass is cited as a concern by most mills, but only one domestic mill and one export market cited actual examples of problems.

4. **Operational changes**
   - None.

<u>Office Pack (OP)</u>

1. **Grades**
   - PS Office Pack #1 as defined is disappearing.
   - As a concession to commingling, one mill is taking a Near White grade, which contains 5% color, and sells for $15 per ton under the white ledger price, but $30 per ton over the OP #1 price.
   - OP #2 is the most popular grade being produced, with 5% out-throws and 1% prohibitives.
   - OP #3 is the same as OP #2, but has more shredded or hammermilled paper.

2. **Demand**
   - Some OP is being mixed in with ONP and marketed to newsprint mills.
   - Demand is relatively constant by mills that produce tissue, and printing and writing papers.

3. **Contamination**
   - Shredded paper from document destruction or hammermilled by balers at the processors cause dust problems at the mill.
   - Export market will limit shredded or hammermilled paper to less than 30% of container load.

4. **Operational changes**
   - One major regional market has added screening in the last year.

Trends for recycled glass markets. Owens-Illinois (OI) remains the dominant Oregon glass container market, consuming more than 75% of state-generated cullet. The OI plant is currently running two amber furnaces which can also use some green and flint cullet. Strategic Materials, Inc. (SMI) exports the remaining Oregon container cullet from the region to California. Of the cullet exported by SMI in 2001, approximately half was mixed-color cullet.

Oregon container cullet and plate glass from Washington and Oregon is sent to SMI's San Leandro plant. The San Leandro plant is the largest glass recycling processor in the U.S., handling more than 225,000 tons of container and plate glass annually.

End markets for the color-sorted Oregon container cullet:
- Glass furnaces for containers, 95%
- Aggregate market or landfill, 5%

End markets for the mixed-color Oregon container cullet:
- Glass furnaces for containers, 5%
- Glass furnaces for fiberglass, 80% to 85%

- Aggregate market or landfill, 5% to 15%

Oregon's mixed-color cullet from a dual stream collection (i.e., glass is separate from fiber) is significantly cleaner than mixed-color cullet from single-stream recycling collection programs. The major contaminant in single-stream glass is ceramic, which keeps this glass from being used by the container manufacturers. Additional problems are paper and other organic garbage that generate carbon upon ignition, which can upset the chemical reaction in the fiberglass furnaces if the carbon level is too high.

Market demand for container cullet, including clean mixed-color cullet, is far greater than available supply. During the recent energy crisis, California plate glass manufacturers started using their own in-house cullet, which for years had gone to processors that marketed it to the fiberglass industry. In addition, fiberglass manufacturers have increased their demand for cullet to minimize the energy costs and emissions.

B. Market Conditions during the Study Period

The following overview of current markets for the materials in this study is intended to add perspective to these data. The author of this market report is the Markets Chair of the Association of Oregon Recyclers, Kent Dunn. These market assessments refer to the study period, May and June 2002.

OCC
Domestic mills and export consumers alike continue to pursue this material aggressively. The price rose sharply during May and June 2002.

White Ledger
Indonesia is the leading export consumer of white ledger, and prices had modest recent increases. Some Northwest mills have begun pursuing white ledger orders again, providing more local options.

Office Pack
These grades remain tough as tissue mills are not consuming large volumes of material. This could be a difficult market in the next few weeks.

ONP
Domestic mills have increased prices, possibly to prevent too much newsprint from finding its way into mixed waste paper.

Mixed Paper
Orders for mixed paper, both “domestic mix” and “export mix,” remain strong this month on higher news and OCC prices. Prices remained somewhat level with the previous month, and increases were reported only in limited circumstances.

Ferrous/Steel
Scrap steel prices rose for the third straight month during June 2002, and orders appear to be plentiful. However, this could change if the World Trade Organization rules that the controversial US steel tariffs violate international trading agreements.

Post Consumer Plastic

Post consumer plastic bottles remain in fairly high demand. Prices have not fluctuated much, but orders are steady and relatively easy to come by.

Table V. Partial list of markets used by Metro regional processors (June 2002)

Fiber	Purchased Commodity	Product
Georgia-Pacific Toledo	Old corrugated containers	Liner, medium
Longview Fibre	Old corrugated containers	Liner, medium, bag
Simpson Tacoma Kraft	Old corrugated containers	Liner
Weyerhaeuser Albany	Old corrugated containers	Liner, bag
Weyerhaeuser North Bend	Old corrugated containers	Medium
Armstrong	Old newspapers	Ceiling tiles
Blue Heron Paper	Old newspapers, mixed scrap paper	News
Daishowa America	Old newspapers, telephone directories, mixed scrap paper	Directory
SP Newsprint	Old newspapers, mixed scrap paper	News
Weyerhaeuser - NORPAC	Old newspapers	News
Georgia-Pacific Halsey	Office pack, coated book	Deink pulp, tissue
Garten Services	Mixed scrap paper	Resort
Export	Old corrugated containers, mixed scrap paper, office pack	Liner, medium, news, tissue

Metals	Purchased Commodity	Product
Oregon Steel Mills	Cans	Plate and other steel products
Metro Metals	Scrap/cans	Steel mill or export
Schnitzer	Scrap/cans	Steel mill or export
Quantum Resource Recovery	Scrap/cans	Resort
SP Recycling	Plastic/metals mix	Resort

Plastics	Purchased Commodity	Product
Marathon	Plastic film	Composite siding
Merlin	Plastic bottles (#1 & #2)	Post-consumer resin
SP Recycling	Plastic containers/metals mix	Resort
Export	Mixed rigid plastic containers	Fiber, pipe

Glass	Purchased Commodity	Product
Strategic Materials, Inc.	Mixed-color glass	Bottles, fiberglass, fill

Sources: Environmental Practices interviews of Metro processors, June 2002; Metro staff market interviews, August 2002.

Section VI. IMPLICATIONS OF STUDY FINDINGS

This section describes the following implications of study findings:

- **Material loss** - what commodity out-throw and prohibitive rates and processor disposal of recyclables mean in terms of mis-stated recovery tons and percentages.
- **Perspectives** - several likely responses to study results.
- **Additional research** – further data that decision makers may want.
- **Metro staff recommendations** - messages and measures will best ensure that commingling improves the regional recycling system and does not disrupt it.

A. Material Loss and Commingling

Overstated recovery. The processor study found that an average of 4% of fiber commodities sorted from commingled loads consisted either of out-throws (non-fiber recyclables) or prohibitives that would be disposed at end-use markets. Commingled fiber from residential and commercial loads comprised 135,000 tons, or 33% of all fiber sent to end-use markets from the Metro region.

This means that Metro-region recovery rates, as calculated by DEQ, are overstated by approximately 5,400 tons, or 0.25 percentage points (out of 45%). The 400,000 tons of recovered fiber that end-use markets reported as received from this region included 1,300 tons of out-throws (recyclables) and 4,100 tons of garbage. (DEQ calculates recovery based on market reports on the tons they receive from particular jurisdictions.)

Metro staff derived this estimate of commodity loss by weighting study findings according to the quantities of each fiber commodity recovered in the region. There are far more tons recovered of the more contaminated commodities, such as mixed waste paper, ONP and OCC, than of the cleaner white ledger and office paper grades.

If all 400,000 tons of fiber recovered in the region were sorted from a fiber/container mixture, the higher rate of out-throws and prohibitives found in the study would apply, resulting in a 17,000-ton over-statement of regional recovery, or 0.75% more credit than the regional recovery rate deserves. Of these 17,000 tons hypothetically disposed under full commingling, 4,000 tons would be recyclables.

Recyclables disposed by processors. Metro staff estimate that the region's processors dispose about 2,000 tons of paper and container recyclables annually, given the rate at which these materials occur in hand-sorted and screened residues. These 2,000 processor tons are in addition to the estimated 1,300 tons disposed after processors remove them from fiber commodities.

This estimate is based on an average 1% disposal rate across all processors in the study (some rates were higher, some lower), and on sampling that showed 45% recyclables content in processor hand-sorted garbage. Non-fiber recyclables comprised 19% of hand-sorted residues, and recyclable fiber amounted to 26%. Screened residues consisted almost entirely of multiple materials that would have been recyclable individually if they hadn't ended up broken, shredded and mixed together. The study did not develop an estimate of screened residues disposed.

These estimates do not consider the feasibility, cost or value of preventing such losses.

Estimated loss of recyclables in processor residue is based on self-reported disposal rates for all processing done in the facility, which includes source-separated single fiber loads as well as more contaminated commingled fiber and fiber/container mixes.

B. Perspectives

Whether a reader considers the outcomes of this study innocuous or alarming will depend in large part on that reader's interests. Some stakeholders will see little if any problem, and may even find encouragement in these results. Other stakeholders may see need and opportunity to change certain aspects of collection or processing.

Can the extent of out-throws and prohibitives found in commodities be reduced, or should such contamination levels be considered a chronic, incurable, nonfatal condition of our recycling system?

Will 4% commodity contamination rates for fiber/container sorting (including out-throw losses approaching 2%) become a greater concern if commingling becomes more common and more extensive?

Is there evidence that these contamination rates increase significantly in communities that lack other collection and processing options?

The perspective on these questions will vary, depending on which stakeholder bears which burdens.

End-use markets would prefer minimal contamination, but most end-use markets do not express great concern about their ability to deal with present levels of contamination. Mills have adjusted their processes, procurement practices and prices in response to changing conditions. Paper mills in Oregon and Washington continue to compete for nearby supplies, which are less expensive than supplies that must be shipped from out of the region. Long-term relationships between local processors and paper mills provide stability to the regional system and do not appear to be threatened at this time.

Processors prefer supply that is less contaminated, because they have to spend more money to sort mixed materials, and the resulting, more-contaminated commodities fetch lower prices. There appears to be a competitive niche for processors that can lower their intake standards, reduce their sorting staffs and increase their sorting speed. Lately, processors have found economic advantage in shipping some mixtures to facilities better equipped and motivated to sort them. Still other processors accept only materials that need minimal sorting. The broad variety of processor strategies fill every niche made possible by the material sources and mixtures collected.

Collection companies, government officials and ratepayers clearly have an interest in avoiding collection cost increases. Commingled collection (including the automated collection of residential recyclables in a single roll cart) optimizes truck cost-efficiency and reduces the need to add vehicles and crews. Collection companies, however, typically have contract or franchise agreements that are intended to cover costs plus a profit margin, so higher expenses, if planned, controlled and compensated, may not trouble collectors as much as they do government officials.

Private, for-profit processing and manufacturing businesses ultimately are responsible for the success of recycling in the Metro region. These companies recycle the material brought to them by publicly controlled collection programs, but they need to make choices that make money.

Government officials have to ensure that public and private choices are consistent with state law and meet public priorities. Do commingling and automated sorting, for example, not only increase recovery but also ensure that source-separated recyclables are sent to markets?

Environmental groups may oppose any loss of materials collected for recycling. This point of view holds that people should consider the environmental consequences of each act of consumption and discard. Groups that seek greater public awareness and adoption of a resource conservation ethic have argued that it debases this ethic when generators and/or collectors mix different materials together, because loosening the standards builds indifference to wasting and disposal of resources.

C. Recommendations

The Metro Regional Environmental Management Department recommends consideration of the following measures to ensure the integrity and success of a recycling system that is responding to increased commingling.

1. **Form a subcommittee of Metro's Solid Waste Advisory Committee to address the loss of recyclables and the increase in residue at processors and markets.**

   This subcommittee could address the above issues in a broad systematic way, including performance standards related to loss of recyclables and residue, roles and responsibilities of involved stakeholders, use of incentives and disincentives, and the economic impacts of changes to the system. Some specific recommendations derived from immediate problems observed in the study are offered with respect to collection, processing and markets and may help shape the discussion of the subcommittee. Stakeholders on the subcommittee should involve haulers, private recycling collectors, processors, markets, local governments, Metro and the Oregon Department of Environmental Quality.

   A. Collection

   i. Prohibit the collection of glass mixed with fiber from commercial generators. Metro and local governments should work to discourage and prohibit generators and collectors of commercial recyclables from mixing glass with fiber, as the local governments currently do with residential recyclables collection. This discrepancy between commercial and residential regulation leads to contamination of all materials when collectors mix loads from both sources on the same vehicle, or when processors mix loads at their facilities. Education and enforcement challenges may be found with multi-family generators and with recyclables collected from front-loaded containers and automated roll-carts. [Since the publication of this draft report, local governments have met and indicated their intention of adopting rules to prohibit the collection of glass mixed with fiber from commercial generators. All local governments intend to instruct haulers to collect glass containers separately from other containers, as well.

   ii. Monitor and enforce proscriptions against collecting glass mixed with recyclables. Local governments have adopted administrative rules for residential recycling collections that require that glass be collected separately from fiber. Compliance with these rules may be slipping. A complaint-driven approach does not appear to be sufficient. One alternative is for a third party, such as Metro or local government representatives, to check deliveries to

processors to ensure compliance. Where possible, collectors should leave notes and, if necessary, withhold collection for generators that do not comply.

iii. Develop consistent education, monitoring and feedback.
Generators need clear and repeated information, aimed both at employees and managers. Collection companies local governments and Metro should provide consistent messages to generators. Collectors should conduct regular inspections of loads and give feedback to generators.

iv. Promote increased recycling by businesses, including fiber-only and fiber/TAP (tin-aluminum-plastic) mixtures.
Messages may vary locally but should encourage only mixtures that processors can handle with minimal loss and contamination. All processors in this study have shown they can keep out-throw levels below 1% with a two-sort of fibers separated from mixed containers; most processors can produce commodities with less than 1% out-throws from fiber/TAP mixtures that do not include glass. Mixing metal and plastic containers with fibers, however, may open the door for more "incidental" glass. If stakeholders can agree on an acceptable level of recyclable losses, commingling offers convenience to generators, may increase participation and recovery (even accounting for out-throw losses), and improves collection economics. It is important to ensure that processors are capable of effectively handling fiber/TAP mixtures before promotion of this mixture to businesses.

B. Processing

i. Discourage or prohibit processors from handling source-separated materials in ways that make them less likely to be recycled.
A combination of government and market pressure is needed to prevent contamination and loss of recyclables caused by processors mixing a variety of materials, either on the floor of their facility before sorting or when reloading them for shipment to other processors. The City of Portland has such a prohibition. If processors mix loads from out-of-region single-stream sources and automated roll cart routes with cleaner regional loads, this will contaminate regional materials. Sorting loss levels should be monitored periodically. Based on container out-throws and disposal across all samples in this study, processors fail to recover more than 14% of all recyclable containers, scrap metal and plastic film delivered to them (see Appendix I).

ii. Processors should provide clear and complete operating plans that indicate how all types of recyclables would be sorted, stored and marketed.
These plans should describe how different mixtures would be handled to ensure maximum recovery of delivered loads. Plans should cover containers and scrap metal as well as fibers.

iii. Processors need to do a better job of removing solid waste from fiber commodities that are produced.
On average, processors removed 37% of the solid waste mixed with commingled recyclables. The balance of 63% of solid waste, or 4,065 tons, was shipped in fiber commodities to their respective markets. The amount of solid waste in fiber commodity shipments is expected to increase to more than 13,000 tons annually as commingling becomes a more accepted regional collection practice.

iv. **Markets**
Fiber markets are faced with the consequences of increasing quantities of solid waste mixed with fiber and greater percentages of unusable fiber in commodities from processors. Although no specific recommendations are made in this report, it is crucial that markets are involved in the discussion because more recyclables are lost and more residues are disposed by markets than by processors.

2. **Increase the focus on the recovery of plastic, metal and glass containers and scrap metal.**

Some collectors may be discouraging their commercial customers from recycling containers and some processors do not accept containers at their facilities. For most commercial generators, container recycling collection is an optional service, unlike residential generators where it is always included in the service. As a result, commercial container recycling rates are 21%, compared to residential container recycling rates of 53%. Some options to increase inclusion of containers and scrap metal in commercial recycling collection are:

A. **Include plastic bottles, metal containers, glass containers and scrap metal in a mandatory disposal ban that has been proposed by the Commercial Recovery Work Group for additional stakeholder discussion.**

B. **Increase promotion of container recovery by local governments and by the Commercial Recovery Work Group as part of their general outreach and targeted assistance program to businesses.**

3. **Undertake additional research.**

Market and government stakeholders may want more and better data to make decisions about the region's approach to recycling. For instance:

A. **Obtain more objective and detailed data on processor disposal of residues to derive a more accurate estimate of recyclables lost through commingling.**

B. **Examine research done in other communities on best management practices and how these can affect out-throw, prohibitive and disposal rates as a result of system changes, such as moving to more automated collection (with wheeled carts) and more automated processing.** National data indicate that, unless best management practices are adopted, residue levels and commodity contamination are likely to increase from our current regional levels as these system changes are implemented.

C. **Research how other communities regulate, enforce and communicate about contamination with all stakeholders, including local governments, haulers, private recycling collectors, processors and markets.**

D. **Evaluate the importance of convenience (mixing of recyclables) for increasing recovery from commercial generators.** Are certain types and sizes of businesses more responsive to convenience? Can routing, equipment or education resolve problems?

4. **Work with the Oregon Department of Environmental Quality to revise existing administrative rules (340-090-0090) that prohibit the disposal of source-separated recyclable materials.**

With commingling, loss of recyclables is occurring both at the processor and the market. In effect, disposal of recyclables is taking place when containers are left in fiber commodities. While commingling does result in net gains in recovery, there are widely divergent levels of recovery by processors. In addition, increasing amounts of solid waste are being collected commingled with recyclables, with less than half of the solid waste removed and disposed by the processor. The majority of the solid waste is commingled with fiber commodities and sent to markets. Thus, the amount of recovered fiber reported to DEQ is inflated by the amount of solid waste in the fiber.

A. DEQ should develop performance standards that are appropriate to commingling that address the loss of recyclables at both processors and markets.

B. DEQ should ask markets for the amount of solid waste contamination in their commodity deliveries. DEQ should reduce market shipments by this solid waste contamination to obtain more accurate figures for recovered materials.

C. DEQ should enforce those standards with processors through reporting and inspection.

APPENDICES

A. Sampling Data Form

B. Fiber Commodity Profiles

C. Statistical Significance of Sampling Results by Commodity

D. Processor Profiles

E. Statistical Significance of Sampling Results by Processing Facility

F. Fiber Commodity Sampling Results

G. Processor Sampling Results

H. Statistical Significance of Sampling Results by Fiber Source and Mixture

I. Container Loss at Processors

J. Loss of Recyclables and Contamination at Markets

APPENDIX A: METRO COMMINGLED COMMERCIAL SAMPLE DATA FORM

SAMPLE ID:			**SAMPLED MATERIAL (circle one)** **1) MRF-Sorted Load** **Processing Residues:** 2) Hand-sorted garbage 3) Screened Residues 4) Other: **Sorted or Visual Commodities Samples:** 5) High-Grade Paper 6) Low-Grade Paper 7) MSP 8) OCC 9) Office Pack 10) ONP #____ 11) Other Paper: 12) Glass 13) Plastic bottles (#1-#7 resins) 14) Plastic Film 15) Aluminum Cans 16) Tin Cans 17) Other:
SITE DATA: Company/Site:			
Date:	Time:	Recorder:	
Load Processed: Fibers / Containers / Both (circle one)			
Was load from a specific generator or other special source? ____ No ____ Yes If yes, explain: _____			
Collection Method and Truck Type:			

COMMODITIES/OUT-THROWS			**PROHIBITIVES**
Total:			**Total Prohibitives:**
Sample Weight			
or Load Weight			**Note prohibitives present:**
or visual sample (check here)			C&D
Cardboard/Kraft			Fines
Magazines			Food
MSP			Glass
Newspaper			Haz. Waste
Other Groundwood			Paper
Paperboard			Plastic
Other Paper:			Textiles
			Wood
			Yard, Garden Debris
			Other:
Glass			
Glass Filaments			
Plastic Bottles			
Plastic Film			**For MRF-Sorted Loads Only**
			Rejects from Sorting Line
Metals			Screened Residues
			Other:
Other:			

Sampling Methods, Number of Sorters and Activities, Possible Sources of Contamination, Other Variables:
Additional Comments:

APPENDIX B

FIBER COMMODITY PROFILES

Appendix B
FIBER COMMODITY PROFILES

Appendix B profiles each commodity sampled in the study, including the facilities producing that commodity, the material sources and mixtures sorted, end-use markets and products made. Each commodity profile includes the Paper Stock Institute (PS) specifications for that fiber grade, allowing comparison of study averages with these PS specifications.

This appendix provides the PS specifications for out-throws and prohibitives, but does not provide the standards for unacceptable fibers.

Many processors make unique arrangements with their markets. It is not within the scope of this project to evaluate how or why these proprietary arrangements vary from PS specifications.

The processors that accept only commercial fiber are the ones that sort fiber into the higher grades, particularly in the ONP, Office Paper and White Ledger categories.

B.1. ONP#7

Produced by: Processors B and C
From material stream: (B) Commercial Fiber/TAP; and (B) Commercial/Residential Fiber/TAP
Markets: Domestic
End products: Newsprint and tissue
PS specs: No prohibitive materials are permitted, and total out-throws may not exceed 0.25%

The ONP content of this material grade ranged between 30.6% and 96.3% in the tested samples. The following table presents the average of the 16 samples taken of this paper grade:

ONP#7 Results

PAPER						
OCC	Mags	MSP	ONP	Groundwood	Paperbd	Paper Subtotal
1.79%	8.80%	17.2%	64.3%	4.23%	2.48%	98.8%

OTHER MATERIALS						
Glass Bottles	Plastic Btls	Plastic Film	Metal	Other Subtotals	PRO-HIBITIVES	TOTAL
0.02%	0.20%	0.08%	0.17%	0.48%	0.68%	100%

B.2. ONP#6

Made by: Processors A, D, F, and G
From material stream: (A) Commercial Fiber; (D) Commercial/Residential Fiber; (F) Single stream of Commercial/Residential fibers and containers, including glass; (G) Commercial/Residential Fiber and Commercial Fiber with minimal TAP (both mixtures)
Markets: Domestic
End products: Newsprint and tissue
PS specs: Prohibitive materials may not exceed 1%, and total out-throws may not exceed 5%.
The ONP content of ONP#6 samples ranged between 8.2% to 98.5% in the 39 samples tested.

ONP#6 Results

PAPER						
OCC	Mags	MSP	ONP	Other Groundwood	Paperbd	Paper Subtotal
1.56%	13.4%	29.5%	46.1%	3.34%	2.81%	96.7%

OTHER MATERIALS						
Glass Bottles	Plastic Btls	Plastic Film	Metal	Other Subtotals	PRO-HIBITIVES	TOTAL
0.11%	0.57%	0.10%	0.40%	1.18%	2.10%	100%

B.3. Office Paper (OP#1 and OP#2)

Made by: Processors E and H
From material stream: (E and H) Commercial Fiber only
Markets: Domestic
End product: Newsprint
PS specs: Baled paper, as typically generated by offices, containing primarily white and colored groundwood-free paper, free of unbleached fiber. It may include a small percentage of groundwood computer printout and facsimile paper. Prohibitive materials may not exceed 2% and the total out-throws may not exceed 5%.
Six samples were taken of OP-1 and four of OP-2. The contents of OP-1 were primarily mixed scrap paper (70.4% - 95.5%) and magazines (2.5% - 12%). The dominant materials in OP-2 were mixed scrap paper (93.7% - 96.3%) and magazines (0.8% - 2.4%).

OP-1 Results

PAPER						
OCC	Mags	MSP	ONP	Other Groundwood	Paperbd	Paper Subtotal
0.25%	6.03%	86.2%	1.13%	0.39%	5.13%	99.1%

OTHER MATERIALS						
Glass Bottles	Plastic Btls	Plastic Film	Metal	Other Subtotals	PRO-HIBITIVES	TOTAL
0.00%	0.00%	0.01%	0.02%	0.03%	0.90%	100%

OP-2 Results

PAPER						
OCC	Mags	MSP	ONP	Other Groundwood	Paperbd	Paper Subtotal
0.11%	1.75%	95.2%	0.62%	0.62%	0.63%	98.9%

OTHER MATERIALS						
Glass Bottles	Plastic Btls	Plastic Film	Metal	Other Subtotals	PRO-HIBITIVES	TOTAL
0.00%	0.00%	0.01%	0.08%	0.09%	1.00%	100%

B.4. Mixed Scrap Paper

Made by: Processors B, C, D, E, and G
From material stream: (B) Commercial/Multi-family Fiber/TAP with more than incidental glass; (C) Commercial/Residential Fiber/TAP; (D) Commercial/Residential Fiber with incidental TAP (E) Commercial Fiber; (G) Commercial Fiber with some TAP
Markets: Both domestic and foreign. Also, some of the mixed scrap paper in this study was reloaded and shipped to other processors for additional sorting before sent to markets.
End product: For domestic markets, newsprint and tissue. Foreign markets' end products include tissue paper, paper towels, and linerboard
PS specs: A baled, clean, sorted mixture of various qualities of paper containing less than 10% groundwood. Prohibitive materials may not exceed 0.5%, and total out-throws may not exceed 3%.

These tables show the averages from the 34 samples of this grade of commodity:

MSP Results

PAPER						
OCC	Mags	MSP	ONP	Other Groundwood	Paperbd	Paper Subtotal
13.1%	7.96%	39.5%	18.6%	4.49%	10.1%	93.8%

OTHER MATERIALS						
Glass Bottles	Plastic Btls	Plastic Film	Metal	Other Subtotals	PRO-HIBITIVES	TOTAL
0.15%	0.63%	0.14%	0.38%	1.31%	4.88%	100%

B.5. Corrugated Cardboard

Made by: Processors A, B, C, D, E, F, and G
From material stream: (A) Commercial fiber; (B) Commercial/Multi-family Fiber/TAP with more than incidental glass; (C) Commercial fiber and some samples from Commercial/Residential Fiber/TAP; (D) Commercial/Residential fiber with incidental TAP; (E) Commercial fiber;
(F) Commercial/Residential fiber and all containers, including glass; (G) Commercial fiber with incidental TAP
Markets: Domestic
End products: Linerboard, kraft bags
PS specs: Baled corrugated containers having liners of either test liner, jute, or kraft. Prohibitive materials may not exceed 1%, and the total out-throws may not exceed 5%.

Actual OCC content ranged from 38.3% to 98.9% over the 52 samples taken. The next highest material content was paperboard, ranging from 0% to 34.4%. These tables show average material distributions:

OCC Results

PAPER						
OCC	Mags	MSP	ONP	Other Groundwood	Paperbd	Paper Subtotal
81.4%	0.77%	3.79%	1.88%	0.73%	8.50%	97.1%

OTHER MATERIALS						
Glass Bottles	Plastic Btls	Plastic Film	Metal	Other Subtotals	PRO-HIBITIVES	TOTAL
0.01%	0.10%	0.11%	0.08%	0.31%	2.61%	100%

B.6. Mixed (or Low-Grade) OCC

Made by: Processors B and F
From material stream: (B) Commercial/Residential Fiber/TAP; and (F) Commercial/Residential Fiber/TAP and glass
Markets: Domestic
End products: Linerboard and corrugated medium
PS specs: The specifications for this mix are designated by the mill and are not published.

The tables below present the average material breakout of the 11 samples taken:

Mixed OCC Results

PAPER						
OCC	Mags	MSP	ONP	Other Groundwood	Paperbd	Paper Subtotal
70.4%	0.32%	1.50%	1.18%	0.94%	23.2%	97.5%

OTHER MATERIALS						
Glass Bottles	Plastic Btls	Plastic Film	Metal	Other Subtotals	PRO-HIBITIVES	TOTAL
0.11%	0.06%	0.09%	0.16%	0.42%	2.03%	100%

B.7. White Ledger

Made by: Processors A, D, E and H
From material stream: (A) Commercial Fiber; and (D) Commercial/Residential Fiber; (E) Commercial Fiber; (H) Commercial Fiber
Markets: Domestic (Processors A and H), export (Processor E), and undecided/new (Processor D)
End products: Paper towels, tissue, bond, or writing paper
PS specs: Baled, uncoated, printed or unprinted sheets, shavings, guillotined books and cuttings of white groundwood-free ledger, bond, writing and other paper that has a similar fiber and filler content. The prohibitive materials may not exceed 0.5%, and total out-throws may not exceed 2%.

The contents of the sampled material ranged from 85% to 99.5% white ledger in the 26 samples taken. The following tables present the average material breakout of all samples:

White Ledger Results

PAPER								
OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other Groundwood	Paperbd	Paper Subtotal
0.85%	94.8%	0.82%	0.25%	0.87%	1.03%	0.59%	0.31%	99.5%

OTHER MATERIALS						
Glass Bottles	Plastic Btls	Plastic Film	Metal	Other Subtotals	PROHIBITIVES	TOTAL
0.00%	0.07%	0.03%	0.01%	0.11%	0.42%	100%

APPENDIX C

STATISTICAL SIGNIFICANCE OF SAMPLING RESULTS BY COMMODITY

Appendix C

STATISTICAL SIGNIFICANCE OF SAMPLING RESULTS BY FIBER COMMODITY

Appendix C and Table C present statistical significance of differences between average out-throw and prohibitive levels and total commodity contamination (out-throws plus prohibitives) for all fiber commodity samples in the study.

This appendix presents results for each commodity without regard to which facility produced the commodity, which source the commodity came from (residential or commercial), or what mixtures were processed (fibers only, fiber/TAP or single stream).

Table C shows the statistical significance (in a sense, the reliability) of average out-throw and prohibitive levels for each commodity sampled and for apparent differences between commodities, based on confidence intervals that take into account the full range of results for all samples of these commodities. Use of the 90% confidence interval means that, were the measurements to be repeated many times, 90% of those times the average value would fall within the confidence intervals shown, and 10% of the time the value would be outside that confidence interval.

Explanation of confidence intervals. For the most part, confidence intervals in Table C bear out the significance of average differences between commodities. The same commodities likely would have higher or lower out-throw levels, prohibitives and contamination totals (out-throws plus prohibitives) than each other if more samples were taken. Minor overlap occurs at the upper or lower extremes between confidence intervals for some commodities, showing a statistical possibility, though not a likelihood, that average differences could reverse in another study.

When confidence intervals overlap entirely for any two materials (one pair of intervals falls entirely within the other), the average difference between the materials is not statistically significant at the 90% confidence level. Two commodities in Table C have entirely overlapping intervals for any factor measured, indicating that no significant difference can be asserted at the 90% confidence level.

- Out-throw intervals for OCC (0.23% - 0.38%) fall within the out-throw intervals for Paperboard/OCC (0.21% - 0.63%).
- Prohibitive and sort loss (prohibitive plus out-throw) intervals for Office Paper #2 encompass those of Office Paper #1. On the other hand, out-throw intervals for these two grades overlap only slightly, leaving OP#1 the cleaner commodity on average.

When two pairs of intervals overlap partially, as they do for several commodities, we cannot eliminate the possibility of significant differences without further statistical tests. In the absence of the need to make any key decisions related to differences between these commodities, the study team has not performed such tests. For example, prohibitives intervals for OCC (2.06% - 3.16%) partly overlap those for ONP#6 (1.36% - 2.81%). Therefore, the difference between average prohibitives for OCC (2.6%) and ONP#6 (2.1%) may or may not be significant at the 90% level of confidence. It is possible, and even likely (but not necessarily 90% likely), that more samples of these two commodities would continue to show similar average differences in prohibitives content.

On the other hand, out-throw intervals for these two commodities (OCC and ONP#6) do not overlap at all, which means the average out-throw differences (0.3% for OCC and 1.2% for ONP#6) are statistically significant at better than the 95% level. (The intervals for each commodity are calculated at the 90% confidence level; entirely non-congruent intervals establish differences at greater than 95% confidence.)

Caveats. It is important to recognize that this study did not control all factors that could influence outcomes. In some facilities, certain samples were taken from commercial loads that contained fibers only, while other samples at the same facility came from commercial Fiber/TAP mixtures or even commercial/residential mixtures. This sampling reflected the way the facilities receive, handle and sort loads on a regular basis, and the commodities they produce. More samples of more controlled mixtures over a longer time frame could change average results—though likely not outside the intervals shown, and not necessarily with more fidelity to the actual situation that exists at each facility.

Statisticians will hedge almost any assertion. When making paired comparisons between many members in a group (e.g., all the commodities), some comparisons may appear to be statistically significant when in fact they could be the one time in 20 when results just happen to exceed the 95% confidence interval by chance. If paired comparisons are made between eight individual items, a total of 21 comparisons will be made. Because a false significance finding is expected about once for each 20 comparisons (using the 95% significance level), it would be expected that an average of one comparison, just by chance, would appear to show a significant difference, even if all of the groups were in fact (would be found over many more samples) equivalent to each other.

That said, 19 times out of 20, the comparisons would hold up.

Samples of partially sorted material that will be shipped to a second processor introduce another variable, and perhaps should be considered separately from samples of commodities going directly to end-use markets. Sampling reloaded ONP#6 and MSP at two facilities may have skewed results for these two grades as well as for the two facilities reloading these commodities. Nonetheless, Metro staff research found that the out-throws and prohibitives in these reloads would not be recovered by the secondary sorters, indicating if not statistically proving that reloading results in contamination levels and loss of recyclables as measured.

Out-throws. Significant (95% level) out-throw differences among commodities, shown in Table B.1, are as follows:

1. White Ledger and Office Pack #1 both have out-throw confidence intervals significantly lower than any other commodity. These materials are produced from commercial fibers only.

2. Office Pack #2 has significantly lower out-throw intervals than any commodity except White Ledger and Office Pack #1, and OP#2 out-throw intervals only slightly overlap the lower extremes of OCC and Paperboard/OCC. OP#2 is produced from commercial fibers only.

3. OCC and Paperboard/OCC have out-throw levels significantly lower than ONP#6 and MSP.

4. ONP#7 (average out-throws of 0.48%) has confidence intervals significantly lower than ONP#6 and Mixed scrap paper, but not statistically different from Paperboard/OCC and slightly overlapping OCC.

5. ONP#6 (average 1.18% out-throws) and Mixed scrap paper (average 1.31%) have nearly overlapping confidence intervals that both are higher than for all other commodities.

Prohibitives. Significant (95% level) prohibitives differences among these commodities, as shown in Table B.1, are as follows:

1. White Ledger (0.24% - 0.60%) and Office Pack #1 (0.61% - 1.18%) both have prohibitives intervals entirely lower than those for OCC, ONP#6, Mixed scrap paper and Paperboard/OCC.

2. Office Pack #2 (0.40% - 1.61%) has prohibitives intervals that entirely overlap (enclose) those for Office Pack #1, but are entirely lower than for OCC and Mixed scrap paper. (The higher end of the interval for OP#2 overlaps the lower extremes for ONP#6 and Paperboard/OCC).

3. ONP#7 prohibitives intervals (0.55% - 0.81%) are lower than those for OCC, ONP#6, MSP or Paperboard/OCC.

4. ONP#6 prohibitives intervals (1.39% - 2.81%) are entirely lower only than those for Mixed scrap paper (4.1% - 5.66%).

Sort loss (out-throws plus prohibitives). Significant (95% level) sort loss differences among these commodities, as shown in Table B.1, are as follows:

1. White Ledger (0.29% - 0.76%) is significantly lower than OCC (2.35% - 3.46%), ONP#6 (2.32% - 4.24%), ONP#7 (0.96% - 1.36%), MSP (5.22% - 7.17%) and Paperboard/OCC (1.67% to 3.24%). White Ledger overlaps both Office Paper grades.

2. Office Pack #2 (0.40% - 1.61%) has prohibitives intervals that entirely overlap (enclose) those for Office Pack #1, but are entirely lower than for OCC and Mixed scrap paper. (The higher end of the interval for OP#2 overlaps the lower extremes for ONP#6 and Paperboard/OCC).

3. ONP#7 prohibitives intervals (0.55% - 0.81%) are lower than those for OCC, ONP#6, MSP or Paperboard/OCC.

4. ONP#6 prohibitives intervals (1.39% - 2.81%) are entirely lower only than those for Mixed scrap paper (4.1% - 5.66%).

TABLE C: Confidence Intervals for Each Commodity Studied

Commingled Commercial Recyclables Processing (May/June 2002)

Out-throws, Prohibitives and Total Contamination for Each Commodity Sampled

(Average Percentages for All Samples in the Study)

Commodity (No. Samples)	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Out-Throw Subtotal	Confidence Int. (90%)	Prohibi-tives	Confidence Int. (90%)	Total Contam.	Confidence Int. (90%)
OCC (N:52)	0.10%	0.10%	0.11%	0.08%	**0.31%**	**(0.23 - 0.38%)**	**2.61%**	**(2.06 - 3.16%)**	**2.92%**	**(2.35 - 3.46%)**
ONP#6 (N:39)	0.11%	0.57%	0.10%	0.40%	**1.18%**	**(0.69 - 1.67%)**	**2.10%**	**(1.39 - 2.81%)**	**3.28%**	**(2.32 - 4.24%)**
ONP#7 (N:16)	0.02%	0.20%	0.08%	0.17%	**0.48%**	**(0.33 - 0.63%)**	**0.68%**	**(0.55 - 0.81%)**	**1.16%**	**(0.96 - 1.36%)**
White Ledger (N:26)	0.00%	0.07%	0.03%	0.01%	**0.11%**	**(0.03 - 0.18%)**	**0.42%**	**(0.24 - 0.60%)**	**0.52%**	**(0.29 - 0.76%)**
Office Pack #1 (N:6)	0.00%	0.00%	0.01%	0.02%	**0.03%**	**(0.00 - 0.06%)**	**0.90%**	**(0.61 - 1.18%)**	**0.92%**	**(0.62 - 1.23%)**
Office Pack #2 (N:4)	0.00%	0.00%	0.01%	0.08%	**0.09%**	**(0.00 - 0.28%)**	**1.00%**	**(0.40 - 1.61%)**	**1.09%**	**(0.30 - 1.89%)**
MSP/MOP (N:34)	0.15%	0.63%	0.14%	0.38%	**1.31%**	**(0.79 - 1.84%)**	**4.88%**	**(4.10 - 5.66%)**	**6.20%**	**(5.22 - 7.17%)**
Paperboard/OCC Mix (N:11)	0.11%	0.06%	0.09%	0.16%	**0.42%**	**(0.21 - 0.63%)**	**2.03%**	**(1.31 - 2.75%)**	**2.45%**	**(1.67 - 3.24%)**

APPENDIX D

PROCESSOR PROFILES

Appendix D

PROCESSOR PROFILES

The eight processors that participated in this study are geographically spread throughout the tri-county region of Metro. The following table categorizes some highlights of these processors. The letter designation of the processors, A through H, is consistent throughout this report.

The column titled "Material Mix" identifies the fiber or fiber/container mixtures from which each processor made the sampled commodities. "Source" refers to the generator of sampled loads; commercial only or commercial mixed with residential. The percentages in that column represent the breakdown of commercial and residential loads accepted at each facility. "Shifts per day" gives an idea of capacity utilization. In the column "Level of Automation," a "high" designation means the processor uses multiple mechanical separation techniques, such as star screens, magnets, air classifiers, and multiple conveyor belts. A "low" level of automation indicates processors that tip material onto a conveyor belt for manual separation. Sometimes this belt is the infeed conveyor to a baler, sometimes it contains a waterfall that spreads out materials for workers to sort or clean. Note: Although most processors confided the tonnage of material they handle monthly and their total capacity, the study team kept this information confidential, as requested by some processors, and used it to aggregated estimates for the entire group.

Pro-cess-or	Material Mix Sampled	Sample Source (% Com/Res at Facility)	Shifts per day	# of sort-ers	Fines Screen	Level of Auto.	Fiber Commodities Produced						
							ONP #6	ONP #7	OCC	Pbrd / OCC	Wh Ldg	MSP	OP
A	Fiber	Comm (100%/0%)	2	1	No	Low	X		X		X		
B	Fiber/ TAP	Comm (15%/85%)	1	12	Yes	High		X	X	X		X	
C	Fiber & Fiber/ TAP	Comm + Res (45%/55%)	1 (12 hrs)	16	No	Low		X	X			X	
D	Fiber & Fiber/ TAP	Comm + Res (15%/85%)	1+	10	Yes	High	X		X		X	X	
E	Fiber	Comm (95%/5%)	Not avail	4	No	Low			X		X	X	X
F	Single Stream	Comm + Res (20%/80%)	1	10	Yes	High	X		X	X		X	
G	Fiber	Comm (40%/60%)	1	5	No	Low	X		X			X	
H	Fiber	Comm (95%/5%)	3	6	Yes	Low		X	X		X	X	X

Out-throw and prohibitive rates. Table C, Facility Out-throw and Prohibitive Rates, following the processor profiles, groups processors according to the source and mixture of materials they sorted in this study, and presents average out-throw and prohibitive rates for each facility, along with total contamination (out-throws plus prohibitives) for sampled commodities. Table V also provides confidence intervals for these commodity contamination factors.

Processor A

Source and mixture of material sampled: Commercial (industrial, office buildings) mixed fibers

Commercial material accepted at facility: mixed fibers, ONP, OCC, OP (fiber only), mixed undeliverable mail with some non-fiber contents.

Other material sources and mixtures processed at the facility: No residential

Material segregation: All commercial, OCC loads handled separately from mixed fiber.

Average monthly tonnage: 2,000

Garbage generated: Actual tonnage unknown; processor states 0.1% of throughput.

Commodities produced: OCC, white ledger, ONP #6, magazines, plastic film

Description of processing mechanisms: This facility has two conveyor lines for incoming material. One is for primarily OCC loads, the other is for mixed fiber. OCC loads, usually from compactors, are tipped at the facility near the infeed belt for the OCC baler. These loads often contain bags of film and bags of paper, which are removed by hand before the material reaches the belt. Mixed-fiber loads are tipped inside the facility to queue up for processing. The material is moved onto the infeed belt of the processing line, which is staffed by one or two people, depending on available time. The positive sorts on the line include white ledger, OCC, plastic film and garbage. The processing line consists of an infeed belt that drops material onto a slow-moving conveyor belt. The negatively sorted material is ONP #6.

Description of markets: All markets are domestic.

Average Contents of Commodities (to nearest 1%)

Commodity	White Ledger	ONP/ Grndwd	OCC	MSP	Mags	Paper-board	Out-throw/ Prohibs.
ONP #6	-----	20%	1%	55%	22%	1%	1%
OCC	-----	2%	61%	14%	-----	21%	3%
White Ledger	98%	1%	-----	1%	-----	-----	-----

Description of facility:

Hours: 6:00 a.m. until 10:30 p.m.
Shifts: 2
Sorting staff: 1 – 2 per shift
Unique business relationships: Works primarily with one hauler, accepting specific loads.
Highlights: This facility generates little garbage, probably due to the controlled input.

Processor B

Source and mixture of material sampled: Commercial fiber/TAP, including some multi-family

Commercial material accepted at the facility: Commercial material is about 15% - 20% of material processed; includes Mixed Office Paper (90% high grade plus magazines, ONP, and OCC); Multi-family collection (fibers mixed with TAP and more than incidental glass); commercial OCC mix (mixed office paper, OCC, and a small percentage of plastic bottles and tin)

Other material sources and mixtures processed at facility: Residential fibers and fiber/TAP, some mixed containers

Material segregation: Commercial is isolated from residential material.

Average monthly tonnage: 3,500 total for residential and commercial

Garbage generated: Confidential (Processor estimated for study team for aggregate calculations)

Commodities produced: OCC, ONP #7, mixed office paper, mixed scrap paper, plastic film, plastic containers, metals

Description of processing mechanisms: Material is pushed onto the infeed line where it travels up to a waterfall and through a load leveler. At this point, three people remove plastics, glass, and large metal. OCC is mechanically separated to a side belt via large star screens, where two more sorters pull contaminants. The OCC is dropped into a bay for later baling. The incline and star screens on this belt allow the smaller materials to fall to a secondary line. This includes ONP, MSP, and containers. This line has a smaller set of star screens closer together to separate the largest materials that are left in the stream. This process, along with four sorters pulling OCC, paperboard, unbleachables, bottles, and cans, result in ONP #7. The remaining smaller pieces of fiber and other material are cleaned up by three sorters pulling browns and garbage, a ferrous metal magnet, and another set of star screen separators to remove containers. The resulting material is mixed office paper.

Description of markets: Mixed scrap paper and plastic containers are exported to market. The remaining commodities have domestic markets. Mixed office paper is sent to a secondary processor for resorting into high grade, two grades of news, and mixed scrap paper.

Average Contents of Commodities (to nearest 1%)

Commodity	ONP/ Ground-wood	OCC	MSP	Mags	Paper-board	Out Throw/ Prohibs
ONP #7	73%	-----	14%	6%	4%	2%
OCC	2%	87%	3%	-----	2%	6%
MSP (MOP)**	18%	3%	59%	10%	2%	8%
Paperboard/OCC	4%	76%	2%	-----	16%	2%

** Processor reloads this fiber and ships to another processor for additional sorting before the fiber is finally marketed. Thus, the percentages of unusable fiber, outthrows and prohibitives reported in the sample above are likely to be reduced from this additional sorting.

Description of facility:

Hours: 3:00 a.m. – 4:30 p.m,. Monday, Wednesday, Friday; 3:00 a.m. – 8:30 p.m., Tuesday, Thursday

Shifts: 1.5 per day average, of which 2 shifts per week are for commercial
Sorting staff: 16 on day shift, 12 on evening shift
Unique business relationships: Some bartering of materials with other processor(s).
Highlights: Commercial material processing is performed during the swing shift twice weekly. Residential material is processed only during the day shift. The highly mechanized separation system caused some shredding of material that ended up in the mixed office paper, making the secondary manual sorting a tedious task. The ferrous metal that is removed via magnet is run through twice due to the high paper content. Beverage aluminum is manually separated from other aluminum and metals to improve the marketability and value of the commodity.

Processor C

Source and mixture of material sampled: Commercial OCC-rich fibers, some commercial/residential fiber/TAP

Commercial materials accepted at facility: Commercial is about 15% - 20% of materials processed; including loads of primarily OCC, plus commercial fiber and fiber/TAP, often mixed with residential loads.

Other material sources and mixtures processed at the facility: Residential three-sort (fiber, mixed-color glass, and TAP), two-sort (mixed fiber/TAP, and mixed-color glass), sometimes including commercial materials mixed with residential, depending on collector routes. Occasional reload from other processors.

Material segregation: Commercial loads of primarily OCC are initially processed separately. Non-OCC material removed from these loads and loads of commercial fiber and fiber/TAP mixtures are processed with residential.

Average monthly tonnage: Confidential (disclosed to study team for aggregate calculations)

Garbage generated: Confidential (not disclosed to study team)

Commodities produced: OCC, ONP #7, MSP, CPO, OP, plastic film, tin/steel, plastic bottles

Description of processing mechanisms: This facility has two methods of processing commercial loads. The loads that are predominantly commercial OCC are tipped near the baler infeed belt. Bags of paper, plastic film, other non-OCC commodities, and garbage are removed manually prior to baling. Other loads that contain a mixture of commingled fiber, quite often a combination of residential and commercial, are transferred to the residential material sort line. One person removes contaminants from the infeed belt. Then the material travels up the belt and over a waterfall where eight sorters remove OCC, chipboard, ONP, magazines, containers, plastic film, and garbage. Mixed scrap paper, the negative sort from this line, is processed twice; once during the day shift and again in the evening.

Description of markets: All of the fiber markets are domestic.

Average Contents of Commodities (to nearest 1%)

Commodity	ONP/ Ground-wood	OCC	MSP	Mags	Paper-board	Out-Throw/ Prohibs
ONP #7	66%	-----	20%	11%	2%	1%
OCC	1%	92%	1%	-----	4%	2%
MSP**	11%	39%	14%	5%	27%	5%

** Processor reloads this fiber and ships to another processor for additional sorting before the fiber is finally marketed. Thus, the percentages of unusable fiber, outthrows and prohibitives reported in the sample above are likely to be reduced from this additional sorting.

Description of facility:

Hours: 3:00 a.m. – 11:00 p.m., M-F
Shifts: 3 part-time shifts
Sorting staff: 16
Unique business relationships: None, although processor has long-term associations with suppliers.

Highlights: All TAP goes to another facility owned by this processor for mechanical and manual separation. The office pack/white ledger combination that is delivered bagged with OCC loads is sent to a domestic secondary processor.

Processor D

Source and mixture of material sampled: Commercial mixed fiber and commercial/residential mixed fibers with some TAP.

Commercial materials accepted at facility: About 15% of materials processed at this facility are commercial, typically delivered mixed with residential materials. All fibers and fiber/TAP mixtures, some with incidental glass, are accepted, as are segregated containers.

Other material sources and mixtures processed at the facility: Residential, including various 2-sorts (all fiber, all containers; fiber/TAP plus all glass) and 3-sorts (all fiber, glass, non-glass containers), and single stream.

Material segregation: TAP and TAP/glass mixtures segregated from fibers as much as possible, and processed on a dedicated line. Commercial materials usually combined with residential.

Average monthly tonnage: Confidential (disclosed to study team for aggregate calculations)

Garbage generated: Confidential (estimated for study team for aggregate calculations)

Commodities produced: OCC, ONP #8, ONP #7, MSP, white ledger, metals (3 sorts), plastic bottles (4 sorts), plastic film.

Description of processing mechanisms: Infeed belt for fiber processing is loaded via a cat and material travels up to a mechanical OCC separator (star screen). Two sorters remove film and bags of garbage or shredded paper and then the material goes over a waterfall where the screen separates OCC onto a secondary line where it is dropped into a bay. The remaining fiber travels over screens to remove fines. Then ONP is separated via disk screens from the remaining fiber and containers where five sorters remove any remaining OCC and white ledger. MSP is the resulting negative sort. Containers are processed by a separate line. They pass through a two-inch trammel screen, removing broken glass and small pieces of metal and garbage. The ferrous metals are removed by a magnet and the remaining materials are then separated via an air classifier, creating a plastic stream with some aluminum and a glass stream. These streams are manually cleaned and separated into four plastic bottle sorts (#1, Nat #2, colored #2, and #3-7), two aluminum sorts (beverage containers and all other), and glass.

Description of markets: OCC, ONP, and MSP all have domestic markets. The collection and separation of white ledger is new and markets are being developed. Metals, plastic bottles, and plastic film all have domestic markets.

Average Contents of Commodities (to nearest 1%)

Commodity	White Ledger	ONP/ Ground-wood	OCC	MSP	Mags	Paper-board	Out-Throws/ Prohibs
ONP #6	-----	51%	3%	27%	12%	4%	3%
OCC	-----	6%	76%	4%	1%	12%	2%
MSP	-----	27%	5%	42%	13%	-----	6%
White Ledger	90%	3%	2%	2%	-----	1%	1%

Description of facility:

Hours: 6:00 a.m. – 4:00 p.m., M-F, plus 7:00 a.m. – 2:00 p.m. Sat.
Shifts: 1 +

Sorting staff: 10
Unique business relationships: Subsidiary of hauling consortium.
Highlights: Recently installed a new automated line. Screened fines and garbage are landfilled. Separate line for processing mixed containers. The mechanized fiber separation shreds some paper.

Processor E

Source and mixture of material sampled: Commercial mixed fibers only

Commercial material accepted at the facility: Fibers only, including mixed and pure loads. No percentage of commercial vs. residential available.

Other material sources and mixtures processed at the facility: Mixed fibers from residential collection and separated containers from drop-off depots. Incidental fiber/TAP.

Material segregation: Commercial is kept separate from residential, and efforts are made to avoid Fiber/TAP mixtures from any source.

Average monthly tonnage: Confidential (not disclosed to study team)

Garbage generated: Confidential (not disclosed to study team)

Commodities produced: OCC, white ledger, Office Pack, MWP

Description of processing mechanisms: The inclined feed belt sends material over one waterfall where four sorters remove OCC, white ledger, garbage, and news/mixed paper to bays below. Office Pack is the negative sort.

Description of markets: All of the fiber markets are domestic. No fibers are sent to a secondary processor for resorting, although at times mixed containers have been sorted elsewhere.

Average Contents of Commodities (to nearest 1%)

Commodity	White Ledger	ONP/ Ground-wood	OCC	MSP	Mags	Paper-board	Out-Throws/ Prohibs
OP #1	-----	2%	-----	77%	9%	10%	1%
OCC	-----	1%	89%	4%	-----	4%	2%
MSP	-----	66%	3%	20%	2%	4%	5%
White Ledger	95%	-----	-----	3%	-----	-----	1%

Description of facility:

Hours: 7:00 a.m. – 4:00 p.m., Monday - Friday
Shifts: 1
Sorting staff: 4
Unique business relationships: Parent company also owns fiber mills.
Highlights: The residue that is pulled from the line is baled for transportation to a landfill.

Processor F

Source and mixture of material sampled: During the study, commercial/residential single stream, fiber only and fiber/TAP loads were mixed together on the delivery floor of the facility creating a homogeneous "single-stream mixture" that was then sorted. [Subsequent to the production of the draft report, this processor has begun segregating these different types of mixtures on the delivery floor.]

Commercial material accepted at the facility: Minimal if any commercial-only loads. Processor estimates its material comes from 20% commercial and 80% residential sources. Some mixtures are fiber/TAP, some are fiber mixed with all containers, and some mixed fibers only are delivered.

Other material sources and mixtures processed at the facility: Out-of-region and in-region reloads from other processors, with some segregation of containers but mostly single-stream.

Material segregation: None evident, although sorting of mixed containers occurs.

Average monthly tonnage: Confidential

Garbage generated: Confidential.

Commodities produced: OCC, ONP#6 (ONP+ MSP), OCC, OCC+paperboard, metals, plastic bottles (Natural HDPE, colored HDPE, PET, mixed bottles), plastic film

Description of processing mechanisms: Material is manually presorted to remove OCC and garbage, then loaded onto the sort line. The incline belt drops material over a small waterfall where 4 sorters remove OCC, film, paperboard, and garbage. A series of star screens separate the fiber into three sizes. Each size is deposited onto a separate sort line. The two lines containing the large- and medium-sized material are staffed with sorters to clean up material. This combination of star screens and elevation change is designed to separate glass and containers from the fiber. All three lines of fiber are then combined and automatically deposited into a truck for loose load transport to the mill. The screens sort most containers onto a fourth conveyor, transporting them past three sorters that pull film, cans, bottles, OCC, tin and paperboard. Two sorters at the end of this belt sort plastic bottles into natural HDPE, PET, colored HDPE, and #3 - #7 bottles. The material that goes off the end of the “container” line includes shredded and whole paper, broken and unbroken glass (glass is not targeted by this facility) and plastic or metal containers not recovered by workers. This end-of-process material is currently landfilled.

Description of markets: All of the fiber markets are domestic.

Average Contents of Commodities (to nearest 1%)

Commodity	ONP/ Ground-Wood	OCC	MSP	Mags	Paper-board	Out-Throws/ Prohibs
ONP #6	40%	3%	26%	17%	7%	7%
OCC	4%	73%	4%	3%	12%	3%
Paperboard/OCC	2%	69%	1%	-----	25%	2%

Description of facility:

Hours: 6:00 a.m. – 10:00 p.m., 5 days per week, with a long and short shift on some days.
Shifts: 1 +
Sorting staff: 10 on full shift
Unique business relationships: Parent company also owns fiber mills.
Highlights: This processor reprocesses materials from three of the other processors in the study.

Processor G

Source and mix of material sampled: Commercial mixed fibers with incidental containers.

Commercial material accepted at the facility: Company officials estimate this facility receives 60% residential and 40% commercial materials plus C&D.

Other material sources and mixtures processed at the facility: During the study, Processor G sorted only mixed commercial fibers, sending commercial and residential fiber/TAP mixtures and segregated containers (TAP and mixed-color glass) to other processors. Since the study, this processor sorts only construction and demolition waste, reloading all other materials for processing elsewhere. The facility still bales pure loads of OCC.

Material segregation: During the study, this facility kept commercial fibers separate from commercial fiber/TAP and from residential fiber/TAP. It also kept (and still keeps) loads of TAP containers and mixed-color glass separate from fibers and from each other before shipment to other processors.

Incoming material accepted: Paper/OCC mix, C&D (wood, OCC, metal, garbage)

Average monthly tonnage: Confidential (disclosed to study team for aggregate calculations; processed commercial material distinguished from reloaded materials and from C&D).

Garbage generated: Confidential (not disclosed to study team)

Commodities produced: OCC, ONP #6, MWP (for resort), plastic film, tin/steel cans, plastic containers (for resort)

Description of processing mechanisms: Material is fed up an incline belt to an OCC screen, which diverts the OCC to a short line to the baler. One sorter pulls plastic film and garbage from the OCC mix, with OCC and paperboard left as the negative sort (material is then baled). The remaining fiber is cleaned by five sorters pulling OCC, garbage and ONP from the mixed waste paper. The MWP passes under a magnet to pull metals and is then loose-loaded into a trailer for resorting at another facility. If it is warranted, the material pulled from both the OCC baling line and the ONP/MWP line is taken either to the C&D separation area or the residential mix reload area to be further sorted.

Description of markets: All fiber markets are domestic.

Average Contents of Commodities (to nearest 1%)

Commodity	ONP/ Ground-wood	OCC	MSP	Mags	Paper-board	Out-Throws/ Prohibs
ONP #6	96%	-----	1%	-----%	-----	2%
OCC	1%	89%	1%	-----	6%	4%
MSP**	22%	7%	51%	8%	5%	6%

** Processor reloads this fiber and ships to another processor for additional sorting before the fiber is finally marketed. Thus, the percentages of unusable fiber, outthrows and prohibitives reported in the sample above are likely to be reduced from this additional sorting.

Description of facility:

Hours: 6:00 a.m. – 4:00 p.m.
Shifts: 1
Sorting staff: 5

Unique business relationships: Owned by collection company that also owns landfills.
Highlights: Public drop-off that accepts yard debris, polystyrene foam, and several types of fibers and containers. Processor G loads plastic containers loose onto trucks for resort at a domestic facility. Materials pulled off the OCC line to the baler are either manually resorted at the facility with C&D waste, or transported to a secondary processor with residential materials. The residential material is dropped off at this location for reload only.

Processor H

Source of material sampled: Commercial mixed fibers only

Material segregation: The few containers are kept entirely separate from fibers, and residential materials are kept separate from commercial.

Commercial material accepted at the facility: Commercial-source fiber is 95% of what this facility processes. It accepts mixtures and pure loads of fiber, both pre- and post-consumer. It maintains a drop-off site that generates some plastic, metal and glass containers.

Average monthly tonnage: 7,500

Garbage generated: 100 tons/month (processor estimate)

Commodities produced: More than 30 grades of fiber, including coated book stock, OCC, white ledger, ONP #8 or 9, OP-1, OP-2, MSP, etc., plus plastic film

Description of processing mechanisms: Material is loaded onto an incline belt and dropped onto a shaker screen to remove garbage and paper fines. These fines are then added back in to the lowest grade of MWP. Two sorters (up to six depending on white ledger market) pull everything except news, which is dropped off the end of the belt and sent to a staging area for baling. The sorters primarily pull white ledger, MWP and garbage off the line. There are U-shaped staging areas for 11 different commodities, including low-grade Mixed waste paper, Office Pack #1, Office Pack #2, Lightly-printed bleached kraft, White ledger, Coated book stock, Printers mix, Mixed colored ledger, hard white, soft white and Unprinted newsprint.

Description of markets: Of the commodities that were sampled for this project, white ledger and MSP are exported and office pack grades have domestic markets.

Average Contents of Commodities (to nearest 1%)

Commodity	White Ledger	ONP/ Ground-wood	OCC	MSP	Mags	Paper-board	Out-Throws/ Prohibs
OP #1	-----	1%	-----	95%	3%	-----	1%
OP #2	-----	1%	-----	95%	2%	-----	1%
White Ledger	98%	-----	-----	1%	-----	-----	-----

Description of facility:

Hours: 24 hours per day, Monday - Friday
Shifts: 3
Sorting staff: 6 per shift
Unique business relationships: Company also owns a fiber mill and does most of its own collection.
Highlights: Material is often delivered in cages with plastic film either bagged or easily retrievable. A 52-cubic-yard drop box weekly of garbage from the line is taken to a company-owned landfill by its own drivers. The waste from the offices and staff are collected via the local hauler.

APPENDIX E

STATISTICAL SIGNIFICANCE OF SAMPLING RESULTS BY PROCESSING FACILITY

TABLE E: Commodity Confidence Intervals for Each Processing Facility

Commingled Commercial Recyclables Processing (May/June 2002)

Out-Throws, Prohibitives and Fiber Subtotal for Each Commodity Sampled
For Each Facility Producing That Commodity (plus Hand-Sorted Garbage)
with Source and Mixture of Material Processed
(Average Percentages for All Samples at Each Facility)

Commodity	Facility (Source/Mix Processed)	Fiber Subtotal	Confidence Interval 90%	Out-Throws	Confidence Interval 90%	Prohibi-tives	Confidence Interval 90%
OCC							
	A (commercial fibers)	**97.2%**	(94.7-99.6%)	**0.27%**	(0.04-0.51%)	**2.57%**	(0.21-4.92%)
	B (commercial fibers/TAP)	**94.3%**	(92.8-95.8%)	**0.21%**	(0.11-0.3%)	**5.45%**	(3.92-6.98%)
	C (com. fibers & com/res,fibers/TAP)	**98.6%**	(97.3-99.8%)	**0.07%**	(0.01-0.12%)	**1.38%**	(0.20-2.56%)
	D (com/res fibers & fibers/TAP)	**98.4%**	(97.8-98.9%)	**0.43%**	(0.27-0.59%)	**1.22%**	(0.72-1.73%)
	E (commercial fibers)	**98.4%**	(95.6-100.0%)	**0.17%**	(0.07-0.26%)	**1.39%**	(0.00-4.24%)
	F (com/res single stream)	**97.2%**	(96.3-98.1%)	**0.59%**	(0.30-0.87%)	**2.21%**	(1.38-3.03%)
	G (commercial fibers)	**96.4%**	(94.5-98.3%)	**0.32%**	(0.07-0.57%)	**3.30%**	(1.53-5.08%)
ONP#6							
	A (commercial fibers)	**98.3%**	(98.1-98.6%)	**0.22%**	(0.09-0.36%)	**1.43%**	(1.19-1.68%)
	D (com/res fibers and fibers/TAP)	**96.7%**	(93.9-99.5%)	**0.70%**	(0.27-1.13%)	**2.61%**	(0.00-5.22%)
	F (com/res single stream)	**93.3%**	(91.9-94.6%)	**3.90%**	(2.67-5.13%)	**2.82%**	(2.23-3.42%)
	G (commercial fibers)	**97.7%**	(95.0-100.0%)	**0.32%**	(0.04-0.60%)	**1.96%**	(0.00-4.46%)
ONP#7							
	B (commercial fibers/TAP)	**98.6%**	(98.3-99.0%)	**0.72%**	(0.49-0.95%)	**0.64%**	(0.47-0.81%)
	C (com. fibers & com/res,fibers/TAP)	**99.0%**	(98.7-99.2%)	**0.30%**	(0.16-0.43%)	**0.71%**	(0.50-0.92%)
White Ledger							
	A (commercial fibers)	**99.8%**	(99.6-99.9%)	**0.01%**	(0.00-0.02%)	**0.23%**	(0.07-0.38%)
	D (com/res fibers & fibers/TAP)	**99.1%**	(98.4-99.7%)	**0.29%**	(0.10-0.48%)	**0.65%**	(0.17-1.12%)
	E (commercial fibers)	**99.1%**	(97.6-100.0%)	**0.02%**	(0.00-0.14%)	**0.91%**	(0.00-2.26%)
	H (commercial fibers)	**99.8%**	(99.6-100.0%)	**0.00%**	(0.00-0.00%)	**0.16%**	(0.00-0.37%)
Office Pack #1							
	E (commercial fibers)	**98.9%**	(98.4-99.5%)	**0.02%**	(0.00-0.10%)	**1.05%**	(0.56-1.54%)
	H (commercial fibers)	**99.2%**	(98.5-99.9%)	**0.03%**	(0.00-0.10%)	**0.75%**	(0.10-1.40%)
Office Pack #2							
	H (commercial fibers)	**98.9%**	(98.1-99.7%)	**0.09%**	(0.00-0.28%)	**1.00%**	(0.40-1.61%)
Mixed Scrap Paper							
reload	**B (commercial fibers/TAP)**	**91.5%**	(87.6-95.3%)	**4.47%**	(2.47-6.46%)	**4.07%**	(1.80-6.35%)
reload	**C (com. fibers & com/res,fibers/TAP)**	**95.2%**	(93.7-96.7%)	**0.48%**	(0.32-0.65%)	**4.34%**	(2.72-5.97%)
	D (com/res fibers & fibers/TAP)	**94.3%**	(91.7-97.0%)	**0.87%**	(0.55-1.18%)	**4.79%**	(2.23-7.35%)
	E (commercial fibers)	**94.7%**	(91.3-98.2%)	**0.17%**	(0.06-0.29%)	**5.09%**	(1.55-8.63%)
reload	**G (commercial fibers)**	**93.6%**	(91.8-95.4%)	**0.76%**	(0.52-1.00%)	**5.93%**	(4.00-7.26%)
Paperboard/OCC Mix							
	B (commercial fibers/TAP)	**97.3%**	(96.1-98.5%)	**0.57%**	(0.00-1.94%)	**2.12%**	(1.99-2.25%)
	F (com/res single stream)	**97.6%**	(96.6-98.6%)	**0.39%**	(0.13-0.64%)	**2.01%**	(1.10-2.92%)
Residues							
	A (commercial fibers)	**10.82%**	(4.9-16.8%)	**24.37%**	(11.56-37.17%)	**64.82%**	(48.46-81.17%)
	B (commercial fibers/TAP)	**5.77%**	(0.00-11.8%)	**18.89%**	(10.95-26.84%)	**75.33%**	(73.41-77.26%)
	C (com. fibers & com/res,fibers/TAP)	**25.54%**	(8.88-42.21%)	**11.22%**	(2.63-19.81%)	**63.23%**	(49.50-76.97%)
	D (com/res fibers & fibers/TAP)	**21.73%**	(15.51-27.95%)	**19.82%**	(2.29-36.96%)	**58.64%**	(36.80-80.49%)
	E (commercial fibers)	**14.64%**		**35.20%**		**50.17%**	
	F (com/res single stream)	**24.64%**	(13.94-35.35%)	**45.68%**	(33.79-57.57%)	**29.68%**	(19.43-39.94%)
	G (commercial fibers)	**10.12%**	(7.42-12.81%)	**37.57%**	(26.58-48.55%)	**52.32%**	(42.69-61.95%)
	H (commercial fibers)	**23.91%**	(0.00-79.32%)	**4.43%**	(0.00-9.18%)	**71.66%**	(21.01-100.00%)

APPENDIX F

FIBER COMMODITY SAMPLING RESULTS

Sampling Results: Mixed Scrap Paper, Mixed Office Paper

				PAPER							OTHER MATERIALS						
Sample #	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other Groundwd	Paperbd	Paper Subtotal	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Other Subtotal	PRO-HIBITIVE	TOTAL
52804	Com	Fiber/TAP	MOP **	2.47%	0.00%	84.68%	0.00%	0.00%	1.06%	88.21%	0.86%	3.83%	0.25%	2.27%	7.21%	4.58%	100.00%
60603	Com	Fiber/TAP	MOP **	1.16%	6.51%	55.19%	21.67%	2.17%	4.33%	91.03%	0.87%	2.31%	0.15%	1.31%	4.63%	4.33%	100.00%
61101	Com	Fiber/TAP	MOP **	1.46%	18.05%	63.16%	1.46%	8.54%	1.46%	94.14%	0.00%	1.35%	0.24%	0.13%	1.72%	4.15%	100.00%
61105	Com	Fiber/TAP	MOP **	3.06%	12.12%	63.76%	9.69%	2.55%	1.53%	92.72%	0.00%	4.08%	0.13%	0.90%	5.11%	2.17%	100.00%
61106	Com	Fiber/TAP	MOP **	2.26%	8.70%	55.12%	10.64%	5.65%	2.26%	84.62%	0.00%	5.16%	0.06%	1.46%	6.68%	8.70%	100.00%
61109	Com	Fiber/TAP	MOP **	4.42%	14.41%	31.50%	34.96%	7.78%	4.99%	98.07%	0.00%	0.77%	0.10%	0.58%	1.44%	0.48%	100.00%
53110	Com/Res	Fiber/TAP	MSP **	46.78%	0.42%	4.20%	3.92%	2.24%	34.15%	91.71%	0.00%	0.14%	0.00%	0.14%	0.28%	8.01%	100.00%
53111	Com/Res	Fiber/TAP	MSP **	41.67%	0.97%	9.16%	5.45%	5.06%	33.69%	96.01%	0.10%	0.19%	0.00%	0.00%	0.29%	3.70%	100.00%
61910	Com/Res	Fiber/TAP	MSP **	48.38%	1.12%	4.08%	2.63%	7.49%	30.10%	93.80%	0.00%	0.00%	0.03%	0.39%	0.42%	5.78%	100.00%
61911	Com/Res	Fiber/TAP	MSP **	42.54%	2.76%	7.68%	2.61%	11.06%	29.48%	96.13%	0.00%	0.46%	0.00%	0.03%	0.49%	3.38%	100.00%
61912	Com/Res	Fiber/TAP	MSP **	36.38%	0.84%	6.48%	2.65%	9.20%	36.93%	92.48%	0.00%	0.06%	0.07%	0.14%	0.27%	7.25%	100.00%
62604	Com/Res	Fiber/TAP	MSP **	37.18%	11.15%	18.73%	4.72%	2.00%	22.16%	95.94%	0.50%	0.06%	0.07%	0.06%	0.69%	3.36%	100.00%
62605	Com/Res	Fiber/TAP	MSP **	19.47%	9.16%	35.80%	8.59%	10.31%	14.37%	97.70%	0.29%	0.29%	0.14%	0.29%	1.00%	1.29%	100.00%
62606	Com/Res	Fiber/TAP	MSP **	37.42%	12.89%	23.96%	5.40%	2.66%	15.28%	97.61%	0.00%	0.14%	0.21%	0.07%	0.43%	1.96%	100.00%
61509	Com/Res	Fibers	MSP	4.42%	27.89%	34.64%	17.20%	4.91%	4.30%	93.36%	0.00%	0.00%	0.62%	0.74%	1.36%	5.29%	100.00%
62001	Com/Res	Fibers	MSP	6.40%	11.46%	38.82%	23.54%	3.72%	9.70%	93.64%	0.04%	0.04%	0.41%	0.50%	0.99%	5.37%	100.00%
62002	Com/Res	Fibers	MSP	6.05%	5.12%	43.40%	18.29%	4.34%	13.80%	91.00%	0.00%	0.16%	0.31%	0.31%	0.78%	8.22%	100.00%
62012	Com/Res	Fibers	MSP	2.18%	12.05%	48.19%	20.72%	5.07%	7.00%	95.20%	0.10%	0.10%	0.02%	0.25%	0.46%	4.34%	100.00%
62407	Com/Res	Fibers	MSP	3.50%	7.84%	46.18%	33.68%	1.91%	5.41%	98.51%	0.00%	0.21%	0.11%	0.42%	0.75%	0.75%	100.00%
60502	Com	Fibers	MSP	4.40%	1.88%	22.31%	56.50%	6.19%	5.54%	96.81%	0.00%	0.16%	0.08%	0.00%	0.25%	2.94%	100.00%
60503	Com	Fibers	MSP	2.85%	2.93%	17.73%	47.66%	16.31%	5.22%	92.70%	0.00%	0.00%	0.08%	0.08%	0.16%	7.13%	100.00%
60508	Com	Fibers	MSP	1.36%	1.15%	19.14%	68.25%	2.91%	1.87%	94.69%	0.00%	0.00%	0.11%	0.00%	0.11%	5.20%	100.00%
53001	Com	Fibers	MSP **	9.35%	0.00%	45.11%	34.30%	0.00%	6.24%	94.99%	0.11%	0.32%	0.00%	0.11%	0.53%	4.47%	100.00%
53002	Com	Fibers	MSP **	12.21%	0.00%	47.58%	20.22%	2.02%	7.46%	89.49%	0.08%	0.00%	0.39%	0.78%	1.25%	9.26%	100.00%
53003	Com	Fibers	MSP **	15.13%	9.09%	33.13%	28.94%	1.55%	5.02%	92.88%	0.66%	0.24%	0.18%	0.18%	1.26%	5.86%	100.00%
53007	Com	Fibers	MSP **	13.05%	5.02%	36.78%	28.34%	2.87%	6.29%	92.35%	0.32%	0.08%	0.00%	0.24%	0.64%	7.01%	100.00%
61006	Com	Fibers	MSP **	6.69%	8.96%	56.38%	12.42%	5.73%	5.38%	95.58%	0.00%	0.00%	0.12%	0.00%	0.12%	4.30%	100.00%
61007	Com	Fibers	MSP **	5.38%	14.61%	58.60%	10.13%	2.69%	4.30%	95.70%	0.00%	0.18%	0.18%	0.18%	0.54%	3.76%	100.00%
61008	Com	Fibers	MSP **	4.68%	13.21%	58.13%	11.79%	2.85%	5.89%	96.55%	0.00%	0.08%	0.11%	0.31%	0.50%	2.95%	100.00%
61012	Com	Fibers	MSP **	5.78%	8.80%	50.89%	15.13%	2.34%	5.78%	88.71%	0.42%	0.83%	0.00%	0.28%	1.52%	9.77%	100.00%
62507	Com	Fibers	MSP **	3.67%	12.48%	64.10%	11.91%	3.35%	2.04%	97.55%	0.74%	0.00%	0.16%	0.00%	0.90%	1.55%	100.00%
62508	Com	Fibers	MSP **	6.47%	6.96%	59.69%	19.90%	1.25%	1.99%	96.25%	0.01%	0.09%	0.09%	0.17%	0.34%	3.40%	100.00%
62510	Com	Fibers	MSP **	2.93%	13.74%	42.23%	17.30%	4.97%	5.85%	87.02%	0.00%	0.25%	0.25%	0.76%	1.27%	11.70%	100.00%
62511	Com	Fibers	MSP **	4.56%	8.31%	55.39%	22.95%	1.00%	3.96%	96.15%	0.08%	0.00%	0.21%	0.00%	0.28%	3.56%	100.00%

**** Reloaded for additional sorting at another processor.**

All Mixed Scrap Papers, All Samples			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average **			13.11%	7.96%	39.47%	18.63%	4.49%	10.14%	93.80%	0.15%	0.63%	0.14%	0.38%	1.31%	4.88%	100.00%
Median			5.58%	8.51%	42.82%	16.16%	3.13%	5.66%	94.41%	0.00%	0.15%	0.11%	0.21%	0.67%	4.34%	
Range	Low		1.16%	0.00%	4.08%	0.00%	0.00%	1.06%	84.62%	0.00%	0.00%	0.00%	0.00%	0.11%	0.48%	
	High		48.38%	27.89%	84.68%	68.25%	16.31%	36.93%	98.51%	0.87%	5.16%	0.62%	2.27%	7.21%	11.70%	

Com, Fibers (MSP, 15 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average **			6.57%	7.14%	44.48%	27.05%	3.73%	4.86%	93.83%	0.16%	0.15%	0.13%	0.21%	0.65%	5.53%	100.00%
Median			5.38%	8.31%	47.58%	20.22%	2.85%	5.38%	94.99%	0.01%	0.08%	0.11%	0.17%	0.53%	4.47%	
Range	Low		1.36%	0.00%	17.73%	10.13%	0.00%	1.87%	87.02%	0.00%	0.00%	0.00%	0.00%	0.11%	1.55%	
	High		15.13%	14.61%	64.10%	68.25%	16.31%	7.46%	97.55%	0.74%	0.83%	0.39%	0.78%	1.52%	11.70%	

Com/Res, Fibers (MSP, 5 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			4.51%	12.87%	42.24%	22.68%	3.99%	8.04%	94.34%	0.03%	0.10%	0.29%	0.44%	0.87%	4.79%	100.00%
Median			4.42%	11.46%	43.40%	20.72%	4.34%	7.00%	93.64%	0.00%	0.10%	0.31%	0.42%	0.78%	5.29%	
Range	Low		2.18%	5.12%	34.64%	17.20%	1.91%	4.30%	91.00%	0.00%	0.00%	0.02%	0.25%	0.46%	0.75%	
	High		6.40%	27.89%	48.19%	33.68%	5.07%	13.80%	98.51%	0.10%	0.21%	0.62%	0.74%	1.36%	8.22%	

Com/Res, Fiber/TAP (MSP, 8 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average **			38.73%	4.92%	13.76%	4.50%	6.25%	27.02%	95.17%	0.11%	0.17%	0.07%	0.14%	0.48%	4.34%	100.00%
Median			39.54%	1.94%	8.42%	4.32%	6.28%	29.79%	95.98%	0.00%	0.14%	0.05%	0.11%	0.42%	3.54%	
Range	Low		19.47%	0.42%	4.08%	2.61%	2.00%	14.37%	91.71%	0.00%	0.00%	0.00%	0.00%	0.27%	1.29%	
	High		48.38%	12.89%	35.80%	8.59%	11.06%	36.93%	97.70%	0.50%	0.46%	0.21%	0.39%	1.00%	8.01%	

Com, Fiber/TAP (MOP, 6 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average **			2.47%	9.96%	58.90%	13.07%	4.45%	2.61%	91.46%	0.29%	2.92%	0.16%	1.11%	4.47%	4.07%	100.00%
Median			2.36%	10.41%	59.18%	10.16%	4.10%	1.89%	91.87%	0.00%	3.07%	0.14%	1.10%	4.87%	4.24%	
Range	Low		1.16%	0.00%	31.50%	0.00%	0.00%	1.06%	84.62%	0.00%	0.77%	0.06%	0.13%	1.44%	0.48%	
	High		4.42%	18.05%	84.68%	34.96%	8.54%	4.99%	98.07%	0.87%	5.16%	0.25%	2.27%	7.21%	8.70%	

Sampling Results: Residue

				PAPER							OTHER MATERIALS						
Sample #	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other Groundwd	Paperbd	Paper Subtotal	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Other Subtotal	PRO-HIBITIVE	TOTAL
60308	Com	Fibers	Residue	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.73%	0.77%	21.50%	78.50%	100.00%
60312	Com	Fibers	Residue	0.00%	0.00%	17.48%	1.75%	0.00%	0.00%	19.23%	48.25%	1.75%	0.00%	4.55%	54.55%	26.22%	100.00%
61410	Com	Fibers	Residue	0.25%	7.14%	2.08%	0.10%	0.20%	0.79%	10.56%	8.13%	0.99%	3.47%	2.18%	14.77%	74.66%	100.00%
61411	Com	Fibers	Residue	3.91%	0.36%	2.14%	0.71%	0.00%	0.36%	7.47%	4.63%	0.36%	0.00%	8.54%	13.52%	79.00%	100.00%
61810	Com	Fibers	Residue	0.30%	0.20%	16.07%	0.60%	0.20%	1.10%	18.47%	10.18%	2.30%	0.80%	2.20%	15.47%	66.06%	100.00%
61811	Com	Fibers	Residue	0.00%	0.00%	8.08%	0.00%	0.00%	1.07%	9.15%	15.04%	3.78%	0.56%	7.00%	26.39%	64.46%	100.00%
60609	Com	Fiber/TAP	Residue	1.67%	1.23%	0.13%	1.42%	0.00%	2.32%	6.76%	9.39%	3.47%	2.70%	1.87%	17.44%	75.80%	100.00%
61110	Com	Fiber/TAP	Residue	1.94%	0.00%	0.81%	0.54%	1.51%	3.95%	8.76%	8.10%	0.92%	0.92%	5.13%	15.08%	76.17%	100.00%
61111	Com	Fiber/TAP	Residue	0.26%	0.00%	1.03%	0.26%	0.00%	0.26%	1.80%	15.68%	0.77%	0.26%	7.46%	24.16%	74.04%	100.00%
53101	Com/Res	Fiber/TAP	Residue	3.85%	0.00%	1.28%	0.00%	0.00%	0.00%	5.13%	0.00%	0.64%	0.00%	2.68%	3.32%	91.55%	100.00%
53102	Com/Res	Fiber/TAP	Residue	0.77%	0.00%	1.10%	0.00%	0.00%	0.00%	1.87%	0.00%	1.15%	0.00%	1.34%	2.49%	95.64%	100.00%
53108	Com/Res	Fiber/TAP	Residue	3.30%	0.29%	4.16%	39.19%	0.46%	1.55%	48.96%	0.00%	0.14%	0.00%	0.07%	0.22%	50.82%	100.00%
61904	Com/Res	Fiber/TAP	Residue	1.94%	9.64%	34.77%	3.18%	18.83%	4.92%	73.28%	0.00%	0.40%	0.60%	0.00%	0.99%	25.73%	100.00%
61905	Com/Res	Fiber/TAP	Residue	0.74%	1.63%	36.06%	2.79%	12.14%	1.47%	54.83%	0.00%	1.11%	0.95%	0.02%	2.07%	43.10%	100.00%
61906	Com/Res	Fiber/TAP	Residue	1.36%	0.12%	2.26%	2.04%	0.12%	1.70%	7.60%	0.00%	0.23%	28.31%	2.72%	31.25%	61.15%	100.00%
62610	Com/Res	Fiber/TAP	Residue	0.37%	0.10%	1.56%	4.85%	0.10%	0.28%	7.24%	0.01%	0.10%	29.63%	2.38%	32.11%	60.64%	100.00%
62611	Com/Res	Fiber/TAP	Residue	0.62%	0.15%	0.93%	1.39%	0.31%	0.70%	4.10%	0.31%	1.54%	21.78%	1.39%	25.02%	70.89%	100.00%
62612	Com/Res	Fiber/TAP	Residue	14.23%	0.62%	2.38%	4.22%	0.00%	5.45%	26.89%	0.00%	0.35%	2.11%	1.05%	3.51%	69.59%	100.00%
61510	Com/Res	Fibers	Residue	0.00%	2.41%	7.42%	0.00%	0.00%	6.11%	15.94%	0.00%	0.44%	0.44%	0.23%	1.10%	82.95%	100.00%
61511	Com/Res	Fibers	Residue	5.24%	0.00%	4.80%	3.49%	0.23%	9.61%	23.37%	1.97%	0.87%	18.77%	1.31%	22.93%	53.70%	100.00%
62008	Com/Res	Fibers	Residue	0.00%	0.00%	1.62%	5.72%	0.00%	10.59%	17.93%	0.00%	0.00%	0.84%	0.00%	0.84%	81.22%	100.00%
62013	Com/Res	Fibers	Residue	2.68%	0.00%	9.57%	2.13%	0.00%	21.26%	35.63%	0.00%	0.55%	34.01%	0.55%	35.12%	29.25%	100.00%
62411	Com/Res	Fibers	Residue	0.00%	0.00%	7.62%	0.00%	0.00%	7.62%	15.24%	0.00%	0.00%	0.23%	5.16%	5.40%	79.36%	100.00%
62412	Com/Res	Fibers	Residue	12.69%	0.00%	5.58%	0.82%	0.00%	3.17%	22.27%	0.00%	0.00%	50.76%	1.59%	52.35%	25.38%	100.00%
60509	Com	Fibers	Residue	1.63%	0.72%	10.47%	1.27%	0.00%	0.55%	14.64%	2.71%	2.89%	23.10%	6.50%	35.20%	50.17%	100.00%
61207	Com/Res	1-Stream	Residue	2.79%	0.70%	4.38%	0.60%	0.00%	8.36%	16.82%	0.00%	8.76%	4.38%	27.66%	40.79%	42.39%	100.00%
61210	Com/Res	1-Stream	Residue	2.59%	0.60%	33.19%	5.84%	3.78%	4.97%	50.97%	0.76%	3.78%	4.76%	23.35%	32.65%	16.38%	100.00%
61212	Com/Res	1-Stream	Residue	5.48%	2.17%	38.94%	0.48%	2.88%	2.26%	52.21%	0.58%	3.37%	0.00%	21.44%	25.38%	22.40%	100.00%
61710	Com/Res	1-Stream	Residue	8.55%	12.07%	4.27%	2.03%	3.85%	3.20%	33.98%	0.43%	1.28%	4.27%	23.18%	29.17%	36.86%	100.00%
61711	Com/Res	1-Stream	Residue	7.93%	0.38%	1.53%	0.38%	4.20%	4.58%	19.01%	0.00%	3.25%	9.55%	22.73%	35.53%	45.46%	100.00%
61712	Com/Res	1-Stream	Residue	5.88%	0.08%	3.40%	2.40%	0.15%	4.10%	16.02%	0.24%	2.17%	30.78%	24.05%	57.23%	26.76%	100.00%
62107	Com/Res	1-Stream	Residue	6.77%	0.00%	6.90%	1.51%	2.64%	1.76%	19.58%	1.89%	3.51%	15.56%	57.71%	78.66%	1.76%	100.00%
62108	Com/Res	1-Stream	Residue	0.91%	0.00%	3.54%	0.23%	0.12%	1.03%	5.83%	0.91%	3.20%	9.13%	26.25%	39.49%	54.67%	100.00%
62109	Com/Res	1-Stream	Residue	1.69%	0.17%	1.61%	0.51%	2.70%	0.68%	7.36%	0.17%	1.52%	10.31%	60.18%	72.19%	20.46%	100.00%
60704	Com	Fibers	Residue	6.98%	0.00%	7.32%	0.23%	0.00%	1.13%	15.66%	9.13%	4.95%	14.86%	2.03%	30.97%	53.37%	100.00%
60705	Com	Fibers	Residue	7.02%	0.00%	0.84%	0.31%	0.00%	2.06%	10.24%	5.04%	4.89%	15.57%	16.42%	41.91%	47.85%	100.00%
61009	Com	Fibers	Residue	2.48%	0.31%	1.86%	0.41%	0.21%	2.79%	8.07%	6.20%	7.23%	19.63%	1.45%	34.50%	57.43%	100.00%
61010	Com	Fibers	Residue	4.77%	0.00%	1.35%	2.70%	0.00%	0.09%	8.92%	3.06%	4.32%	6.48%	13.86%	27.72%	63.36%	100.00%
61011	Com	Fibers	Residue	1.43%	1.32%	6.86%	0.11%	0.05%	1.83%	11.59%	4.17%	3.20%	8.34%	12.00%	27.72%	60.69%	100.00%
62509	Com	Fibers	Residue	0.18%	0.54%	1.06%	1.42%	0.71%	2.31%	6.23%	1.42%	3.02%	57.08%	1.06%	62.58%	31.20%	100.00%
60403	Com	Fibers	Residue	1.36%	1.71%	17.01%	0.35%	10.89%	1.36%	32.69%	0.00%	0.14%	3.40%	0.14%	3.67%	63.64%	100.00%
60409	Com	Fibers	Residue	0.00%	9.96%	5.18%	0.00%	0.00%	0.00%	15.14%	0.00%	0.00%	5.18%	0.00%	5.18%	79.68%	100.00%

All Residue, All Mixes			**OCC**	**Mags**	**MSP**	**ONP**	**Groundwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			2.97%	1.30%	7.59%	2.28%	1.58%	3.03%	18.75%	3.77%	1.98%	10.96%	9.53%	26.24%	55.01%	100.00%
Median			1.68%	0.16%	3.85%	0.66%	0.07%	1.73%	15.19%	0.37%	1.22%	4.57%	2.53%	25.88%	59.04%	
Range	Low		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.22%	1.76%	
	High		14.23%	12.07%	38.94%	39.19%	18.83%	21.26%	73.28%	48.25%	8.76%	57.08%	60.18%	78.66%	95.64%	

Com/Res, Fibers Only			**OCC**	**Mags**	**MSP**	**ONP**	**Groundwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			3.43%	0.40%	6.10%	2.03%	0.04%	9.73%	21.73%	0.33%	0.31%	17.51%	1.47%	19.62%	58.64%	100.00%
Median			1.34%	0.00%	6.50%	1.48%	0.00%	8.61%	20.10%	0.00%	0.22%	9.81%	0.93%	14.16%	66.53%	
Range	Low		0.00%	0.00%	1.62%	0.00%	0.00%	3.17%	15.24%	0.00%	0.00%	0.23%	0.00%	0.84%	25.38%	
	High		12.69%	2.41%	9.57%	5.72%	0.23%	21.26%	35.63%	1.97%	0.87%	50.76%	5.16%	52.35%	82.95%	

Com/Res, Fiber/TAP			**OCC**	**Mags**	**MSP**	**ONP**	**Groundwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			3.02%	1.39%	9.39%	6.41%	3.55%	1.79%	25.54%	0.04%	0.63%	9.26%	1.30%	11.22%	63.23%	100.00%
Median			1.36%	0.15%	2.26%	2.79%	0.12%	1.47%	7.60%	0.00%	0.40%	0.95%	1.34%	3.32%	61.15%	
Range	Low		0.37%	0.00%	0.93%	0.00%	0.00%	0.00%	1.87%	0.00%	0.10%	0.00%	0.00%	0.22%	25.73%	
	High		14.23%	9.64%	36.06%	39.19%	18.83%	5.45%	73.28%	0.31%	1.54%	29.63%	2.72%	32.11%	95.64%	

Com, Fiber Only			**OCC**	**Mags**	**MSP**	**ONP**	**Groundwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			2.02%	0.81%	5.82%	0.74%	0.10%	1.08%	10.79%	9.07%	3.05%	13.12%	6.04%	31.29%	57.92%	100.00%
Median			1.36%	0.20%	2.14%	0.41%	0.00%	1.07%	10.24%	5.04%	3.02%	8.34%	4.55%	27.72%	60.69%	
Range	Low		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.77%	13.52%	26.22%	
	High		7.02%	7.14%	17.48%	2.70%	0.71%	2.79%	19.23%	48.25%	7.23%	57.08%	16.42%	62.58%	79.00%	

Com, Fiber/TAP			**OCC**	**Mags**	**MSP**	**ONP**	**Groundwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			1.29%	0.41%	0.66%	0.74%	0.50%	2.17%	5.77%	11.06%	1.72%	1.29%	4.82%	18.89%	75.33%	100.00%
Median			1.67%	0.00%	0.81%	0.54%	0.00%	2.32%	6.76%	9.39%	0.92%	0.92%	5.13%	17.44%	75.80%	
Range	Low		0.26%	0.00%	0.13%	0.26%	0.00%	0.26%	1.80%	8.10%	0.77%	0.26%	1.87%	15.08%	74.04%	
	High		1.94%	1.23%	1.03%	1.42%	1.51%	3.95%	8.76%	15.68%	3.47%	2.70%	7.46%	24.16%	76.17%	

Com/Res, 1-Stream			**OCC**	**Mags**	**MSP**	**ONP**	**Groundwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			4.73%	1.80%	10.86%	1.55%	2.26%	3.44%	24.64%	0.55%	3.43%	9.86%	31.84%	45.68%	29.68%	100.00%
Median			5.48%	0.38%	4.27%	0.60%	2.70%	3.20%	19.01%	0.43%	3.25%	9.13%	24.05%	39.49%	26.76%	
Range	Low		0.91%	0.00%	1.53%	0.23%	0.00%	0.68%	5.83%	0.00%	1.28%	0.00%	21.44%	25.38%	1.76%	
	High		8.55%	12.07%	38.94%	5.84%	4.20%	8.36%	52.21%	1.89%	8.76%	30.78%	60.18%	78.66%	54.67%	

Sampling Results: Paperboard - OCC Mix

				PAPER							OTHER MATERIALS						
Sample #	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other Groundwd	Paperbd	Paper Subtotal	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Other Subtotal	PRO-HIBITIVE	TOTAL
52807	Com	Fiber/TAP	Paperboard/OCC Mix	86.35%	0.00%	2.85%	2.14%	0.00%	6.16%	97.50%	0.00%	0.00%	0.36%	0.00%	0.36%	2.14%	100.00%
62106	Com/Res	1-Stream	Paperboard/OCC Mix	81.69%	0.08%	0.08%	0.31%	0.15%	17.50%	99.81%	0.00%	0.08%	0.00%	0.08%	0.16%	0.03%	100.00%
62104	Com/Res	1-Stream	Paperboard/OCC Mix	79.07%	0.00%	0.27%	0.54%	0.96%	18.20%	99.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.96%	100.00%
61209	Com/Res	1-Stream	Paperboard/OCC Mix	72.10%	0.60%	4.33%	1.86%	0.87%	19.11%	98.88%	0.00%	0.05%	0.07%	0.07%	0.19%	0.93%	100.00%
62105	Com/Res	1-Stream	Paperboard/OCC Mix	72.57%	1.18%	0.96%	0.15%	0.29%	20.86%	96.00%	0.03%	0.00%	0.08%	0.08%	0.18%	3.82%	100.00%
61705	Com/Res	1-Stream	Paperboard/OCC Mix	68.09%	0.43%	1.54%	1.80%	0.68%	23.55%	96.08%	0.03%	0.26%	0.12%	0.34%	0.76%	3.16%	100.00%
60607	Com	Fiber/TAP	Paperboard/OCC Mix	64.58%	0.08%	2.17%	3.42%	1.79%	25.07%	97.11%	0.01%	0.00%	0.01%	0.78%	0.79%	2.10%	100.00%
61704	Com/Res	1-Stream	Paperboard/OCC Mix	68.86%	0.30%	0.69%	0.78%	0.69%	26.53%	97.85%	0.59%	0.20%	0.20%	0.10%	1.08%	1.08%	100.00%
61706	Com/Res	1-Stream	Paperboard/OCC Mix	62.26%	0.30%	2.36%	1.55%	0.96%	28.62%	96.05%	0.52%	0.03%	0.08%	0.30%	0.92%	3.03%	100.00%
61211	Com/Res	1-Stream	Paperboard/OCC Mix	62.98%	0.09%	0.75%	0.33%	1.40%	33.30%	98.85%	0.00%	0.00%	0.00%	0.00%	0.00%	1.15%	100.00%
61208	Com/Res	1-Stream	Paperboard/OCC Mix	55.66%	0.46%	0.54%	0.15%	2.59%	36.45%	95.85%	0.03%	0.08%	0.08%	0.00%	0.19%	3.96%	100.00%

Paperboard/OCC, All Samples			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			70.38%	0.32%	1.50%	1.18%	0.94%	23.21%	97.55%	0.11%	0.06%	0.09%	0.16%	0.42%	2.03%	100.00%
Median			68.86%	0.30%	0.96%	0.78%	0.87%	23.55%	97.50%	0.01%	0.03%	0.08%	0.08%	0.19%	2.10%	
Range	Low		55.66%	0.00%	0.08%	0.15%	0.00%	6.16%	95.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	
	High		86.35%	1.18%	4.33%	3.42%	2.59%	36.45%	99.81%	0.59%	0.26%	0.36%	0.78%	1.08%	3.96%	

Com/Res, 1-Stream (9 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			69.25%	0.38%	1.28%	0.83%	0.96%	24.90%	97.60%	0.13%	0.08%	0.07%	0.11%	0.39%	2.01%	100.00%
Median			68.86%	0.30%	0.75%	0.54%	0.87%	23.55%	97.85%	0.03%	0.05%	0.08%	0.08%	0.19%	1.15%	
Range	Low		55.66%	0.00%	0.08%	0.15%	0.15%	17.50%	95.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	
	High		81.69%	1.18%	4.33%	1.86%	2.59%	36.45%	99.81%	0.59%	0.26%	0.20%	0.34%	1.08%	3.96%	

Com, Fiber/TAP			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			75.46%	0.04%	2.51%	2.78%	0.89%	15.62%	97.31%	0.00%	0.00%	0.18%	0.39%	0.57%	2.12%	100.00%
Median			75.46%	0.04%	2.51%	2.78%	0.89%	15.62%	97.31%	0.00%	0.00%	0.18%	0.39%	0.57%	2.12%	
Range	Low		64.58%	0.00%	2.17%	2.14%	0.00%	6.16%	97.11%	0.00%	0.00%	0.01%	0.00%	0.36%	2.10%	
	High		86.35%	0.08%	2.85%	3.42%	1.79%	25.07%	97.50%	0.01%	0.00%	0.36%	0.78%	0.79%	2.14%	

Sampling Results: Office Pack - 2

				PAPER							OTHER MATERIALS						
Sample #	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other Groundwd	Paperbd	Paper Subtotal	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Other Subtotal	PRO-HIBITIVE	TOTAL
60401	Com	Fibers	OP #2	0.03%	2.42%	93.67%	0.08%	1.13%	0.57%	97.90%	0.00%	0.00%	0.01%	0.32%	0.33%	1.77%	100.00%
60402	Com	Fibers	OP #2	0.24%	2.04%	95.37%	0.63%	0.63%	0.31%	99.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.78%	100.00%
60411	Com	Fibers	OP #2	0.15%	1.77%	95.39%	0.15%	0.31%	1.54%	99.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.69%	100.00%
60412	Com	Fibers	OP #2	0.00%	0.77%	96.30%	1.61%	0.43%	0.09%	99.20%	0.00%	0.00%	0.03%	0.00%	0.03%	0.77%	100.00%

Office Paper #2: All Samples

Average			0.11%	1.75%	95.18%	0.62%	0.62%	0.63%	98.91%	0.00%	0.00%	0.01%	0.08%	0.09%	1.00%	100.00%
Median			0.09%	1.90%	95.38%	0.39%	0.53%	0.44%	99.21%	0.00%	0.00%	0.00%	0.00%	0.02%	0.78%	
Range	Low		0.00%	0.77%	93.67%	0.08%	0.31%	0.09%	97.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.69%	
	High		0.24%	2.42%	96.30%	1.61%	1.13%	1.54%	99.31%	0.00%	0.00%	0.03%	0.32%	0.33%	1.77%	

Sampling Results: Office Pack - 1

				PAPER							OTHER MATERIALS						
Sample #	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other Groundwd	Paperbd	Paper Subtotal	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Other Subtotal	PRO-HIBITIVE	TOTAL
60504	Com	Fibers	OP #1	0.18%	11.96%	70.38%	1.75%	0.28%	13.98%	98.54%	0.00%	0.00%	0.04%	0.04%	0.07%	1.38%	100.00%
60505	Com	Fibers	OP #1	0.55%	9.89%	78.02%	1.19%	0.46%	8.97%	99.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.92%	100.00%
60507	Com	Fibers	OP #1	0.19%	5.34%	83.61%	1.87%	0.66%	7.49%	99.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.85%	100.00%
60407	Com	Fibers	OP #1	0.20%	2.73%	96.15%	0.00%	0.31%	0.31%	99.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	100.00%
60408	Com	Fibers	OP #1	0.35%	3.82%	93.33%	1.39%	0.14%	0.00%	99.02%	0.00%	0.00%	0.01%	0.07%	0.08%	0.90%	100.00%
60410	Com	Fibers	OP #1	0.00%	2.46%	95.45%	0.55%	0.48%	0.03%	98.97%	0.00%	0.00%	0.01%	0.00%	0.01%	1.03%	100.00%

Office Pack#1: All Samples (6)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			0.25%	6.03%	86.15%	1.13%	0.39%	5.13%	99.08%	0.00%	0.00%	0.01%	0.02%	0.03%	0.90%	100.00%
Median			0.19%	4.58%	88.47%	1.29%	0.38%	3.90%	99.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	
Range	Low		0.00%	2.46%	70.38%	0.00%	0.14%	0.00%	98.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	
	High		0.55%	11.96%	96.15%	1.87%	0.66%	13.98%	99.69%	0.00%	0.00%	0.04%	0.07%	0.08%	1.38%	

Sampling Results: ONP #6

				PAPER							OTHER MATERIALS						
Sample #	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other Groundwd	Paperbd	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	PRO-HIBITIVE	TOTAL
53004	Com	Fibers	ONP #6	0.08%	0.15%	1.04%	98.50%	0.00%	0.08%	99.85%	0.08%	0.00%	0.00%	0.00%	0.08%	0.08%	100.00%
53005	Com	Fibers	ONP #6	0.00%	0.40%	1.48%	97.17%	0.27%	0.13%	99.46%	0.07%	0.00%	0.07%	0.27%	0.41%	0.13%	100.00%
53006	Com	Fibers	ONP #6	0.00%	0.47%	1.57%	97.56%	0.00%	0.08%	99.68%	0.08%	0.00%	0.08%	0.00%	0.16%	0.16%	100.00%
60304	Com	Fibers	ONP #6	2.45%	20.53%	41.35%	29.25%	3.53%	0.94%	98.05%	0.00%	0.07%	0.07%	0.22%	0.37%	1.58%	100.00%
60305	Com	Fibers	ONP #6	1.38%	28.02%	50.09%	11.15%	7.38%	0.43%	98.45%	0.03%	0.00%	0.08%	0.00%	0.10%	1.45%	100.00%
60306	Com	Fibers	ONP #6	1.44%	31.99%	41.98%	19.55%	2.66%	0.58%	98.20%	0.00%	0.00%	0.07%	0.00%	0.07%	1.73%	100.00%
60307	Com	Fibers	ONP #6	1.08%	26.99%	45.34%	19.79%	3.42%	0.63%	97.26%	0.00%	0.00%	0.09%	0.04%	0.13%	2.61%	100.00%
60309	Com	Fibers	ONP #6	0.54%	34.70%	39.33%	14.97%	8.08%	0.83%	98.45%	0.00%	0.00%	0.06%	0.00%	0.06%	1.49%	100.00%
60706	Com	Fibers	ONP #6	0.07%	0.00%	0.53%	83.39%	0.34%	0.27%	84.60%	0.47%	0.27%	0.03%	0.60%	1.37%	14.03%	100.00%
61004	Com	Fibers	ONP #6	0.00%	0.00%	2.09%	97.38%	0.00%	0.46%	99.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	100.00%
61005	Com	Fibers	ONP #6	0.28%	1.42%	0.93%	96.01%	0.00%	0.22%	98.86%	0.00%	0.00%	0.00%	0.00%	0.00%	1.14%	100.00%
61201	Com/Res	1-Stream	ONP #6	3.03%	12.92%	27.75%	42.10%	1.28%	5.42%	92.50%	0.08%	3.19%	0.24%	0.64%	4.15%	3.35%	100.00%
61202	Com/Res	1-Stream	ONP #6	3.32%	21.09%	30.01%	28.91%	5.21%	5.61%	94.16%	0.16%	2.21%	0.32%	1.11%	3.79%	2.05%	100.00%
61206	Com/Res	1-Stream	ONP #6	2.90%	18.86%	34.42%	30.67%	2.66%	6.65%	96.16%	0.31%	0.63%	0.24%	0.31%	1.49%	2.35%	100.00%
61401	Com	Fibers	ONP #6	0.14%	20.97%	66.84%	9.29%	1.17%	0.41%	98.82%	0.00%	0.00%	0.03%	0.00%	0.03%	1.16%	100.00%
61402	Com	Fibers	ONP #6	0.00%	31.65%	49.23%	13.80%	3.70%	0.68%	99.05%	0.00%	0.00%	0.07%	0.00%	0.07%	0.88%	100.00%
61403	Com	Fibers	ONP #6	0.37%	11.04%	68.29%	16.57%	0.55%	1.39%	98.21%	0.74%	0.00%	0.18%	0.04%	0.96%	0.83%	100.00%
61404	Com	Fibers	ONP #6	0.08%	13.55%	73.70%	8.22%	1.98%	1.07%	98.59%	0.54%	0.00%	0.00%	0.03%	0.57%	0.84%	100.00%
61502	Com/Res	Fibers	ONP #6	4.48%	18.97%	30.50%	30.80%	5.01%	3.64%	93.39%	0.00%	0.69%	0.08%	0.15%	0.92%	5.69%	100.00%
61503	Com/Res	Fibers	ONP #6	2.85%	17.13%	32.35%	35.52%	2.70%	6.19%	96.75%	0.00%	1.12%	0.06%	0.63%	1.81%	1.43%	100.00%
61701	Com/Res	1-Stream	ONP #6	2.32%	14.15%	20.61%	41.79%	7.11%	7.40%	93.39%	1.09%	0.87%	0.15%	2.40%	4.50%	2.11%	100.00%
61702	Com/Res	1-Stream	ONP #6	2.39%	18.52%	19.72%	43.22%	1.99%	5.38%	91.23%	0.00%	1.30%	0.20%	2.10%	3.59%	5.18%	100.00%
61703	Com/Res	1-Stream	ONP #6	2.47%	25.15%	18.37%	39.20%	4.93%	6.17%	96.29%	0.35%	0.41%	0.07%	0.21%	1.04%	2.68%	100.00%
61805	Com	Fibers	ONP #6	0.71%	17.07%	59.93%	15.42%	4.42%	0.53%	98.09%	0.02%	0.00%	0.06%	0.00%	0.08%	1.83%	100.00%
61806	Com	Fibers	ONP #6	1.14%	16.34%	58.00%	17.14%	3.82%	1.61%	98.05%	0.00%	0.13%	0.07%	0.01%	0.21%	1.74%	100.00%
61807	Com	Fibers	ONP #6	0.37%	17.47%	59.47%	15.02%	5.43%	0.82%	98.58%	0.00%	0.08%	0.08%	0.00%	0.15%	1.27%	100.00%
61808	Com	Fibers	ONP #6	0.31%	13.74%	64.56%	16.48%	2.22%	1.37%	98.67%	0.00%	0.08%	0.03%	0.00%	0.11%	1.22%	100.00%
62003	Com/Res	Fibers	ONP #6	1.74%	9.97%	31.64%	50.78%	2.14%	3.25%	99.52%	0.00%	0.08%	0.00%	0.16%	0.24%	0.24%	100.00%
62004	Com/Res	Fibers	ONP #6	0.68%	7.78%	39.76%	42.98%	4.74%	3.72%	99.65%	0.00%	0.09%	0.09%	0.00%	0.18%	0.17%	100.00%
62005	Com/Res	Fibers	ONP #6	3.97%	10.99%	25.77%	39.29%	13.70%	5.05%	98.77%	0.00%	0.24%	0.18%	0.00%	0.42%	0.81%	100.00%
62101	Com/Res	1-Stream	ONP #6	2.43%	11.43%	39.52%	23.63%	6.20%	10.65%	93.86%	0.04%	2.13%	0.19%	1.26%	3.63%	2.52%	100.00%
62102	Com/Res	1-Stream	ONP #6	3.71%	14.06%	25.19%	33.59%	3.71%	9.37%	89.64%	0.10%	4.30%	0.10%	3.32%	7.82%	2.54%	100.00%
62103	Com/Res	1-Stream	ONP #6	8.03%	16.06%	14.75%	36.88%	6.88%	9.67%	92.29%	0.00%	3.77%	0.25%	1.07%	5.09%	2.62%	100.00%
62403	Com/Res	Fibers	ONP #6	0.00%	9.48%	7.90%	73.92%	3.40%	4.42%	99.12%	0.00%	0.16%	0.08%	0.08%	0.32%	0.56%	100.00%
62404	Com/Res	Fibers	ONP #6	4.70%	6.88%	21.65%	44.30%	9.40%	2.69%	89.62%	0.00%	0.09%	0.09%	0.84%	1.01%	9.37%	100.00%
62501	Com	Fibers	ONP #6	0.09%	0.35%	2.34%	95.60%	0.03%	0.44%	98.84%	0.09%	0.00%	0.03%	0.00%	0.12%	1.04%	100.00%
62502	Com	Fibers	ONP #6	0.62%	0.53%	1.49%	93.12%	0.27%	0.62%	96.63%	0.04%	0.35%	0.35%	0.27%	1.00%	2.37%	100.00%
62503	Com	Fibers	ONP #6	0.39%	0.46%	0.61%	97.81%	0.00%	0.23%	99.51%	0.00%	0.00%	0.03%	0.00%	0.03%	0.46%	100.00%
62504	Com	Fibers	ONP #6	0.24%	0.47%	0.31%	98.20%	0.00%	0.62%	99.84%	0.00%	0.00%	0.01%	0.00%	0.01%	0.16%	100.00%

All ONP#6, All Mixes (36 samples)			**OCC**	**Mags**	**MSP**	**ONP**	**Grndwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			1.56%	13.38%	29.50%	46.13%	3.34%	2.81%	96.72%	0.11%	0.57%	0.10%	0.40%	1.18%	2.10%	100.00%
Median			0.71%	13.74%	30.01%	36.88%	2.70%	1.07%	98.21%	0.00%	0.08%	0.07%	0.04%	0.32%	1.45%	100.00%
Range	Low		0.00%	0.00%	0.31%	8.22%	0.00%	0.08%	84.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	100.00%
	High		8.03%	34.70%	73.70%	98.50%	13.70%	10.65%	99.93%	1.09%	4.30%	0.35%	3.32%	7.82%	14.03%	100.00%

Com/Res, Fibers Only (7 samples)			**OCC**	**Mags**	**MSP**	**ONP**	**Grndwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			2.63%	11.60%	27.08%	45.37%	5.87%	4.14%	96.69%	0.00%	0.35%	0.08%	0.27%	0.70%	2.61%	100.00%
Median			2.85%	9.97%	30.50%	42.98%	4.74%	3.72%		0.00%	0.16%	0.08%	0.15%	0.42%	0.81%	
Range	Low		0.00%	6.88%	7.90%	30.80%	2.14%	2.69%	89.62%	0.00%	0.08%	0.00%	0.00%	0.18%	0.17%	
	High		4.70%	18.97%	39.76%	73.92%	13.70%	6.19%	99.65%	0.00%	1.12%	0.18%	0.84%	1.81%	9.37%	

Com/Res, Fiber/TAP

No ONP#6 was produced at facilities that handle Commercial/Residential, Fiber/TAP mixtures

Com, Fibers Only (23 samples)			**OCC**	**Mags**	**MSP**	**ONP**	**Grndwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			0.51%	12.54%	31.76%	50.50%	2.14%	0.63%	98.07%	0.09%	0.04%	0.07%	0.06%	0.27%	1.66%	100.00%
Median			0.31%	13.55%	41.35%	19.79%	1.17%	0.58%	98.59%	0.00%	0.00%	0.06%	0.00%	0.11%	1.16%	
Range	Low		0.00%	0.00%	0.31%	8.22%	0.00%	0.08%	84.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	
	High		2.45%	34.70%	73.70%	98.50%	8.08%	1.61%	99.93%	0.74%	0.35%	0.35%	0.60%	1.37%	14.03%	

Com, Fiber/TAP

No ONP#6 was produced at facilities that handle Commercial-Only Fiber/TAP mixtures

Com/Res, 1-Stream (6 samples)			**OCC**	**Mags**	**MSP**	**ONP**	**Grndwd**	**Paperbd**	**PaperSub**	**Glass**	**PlasBots**	**PlasFilm**	**Metal**	**Oth,Sub**	**Prohibs**	**TOTAL**
Average			3.40%	16.92%	25.59%	35.56%	4.44%	7.37%	93.28%	0.24%	2.09%	0.20%	1.38%	3.90%	2.82%	100.00%
Median			2.90%	16.06%	25.19%	36.88%	4.93%	6.65%	93.39%	0.10%	2.13%	0.20%	1.11%	3.79%	2.54%	
Range	Low		2.32%	11.43%	14.75%	23.63%	1.28%	5.38%	89.64%	0.00%	0.41%	0.07%	0.21%	1.04%	2.05%	
	High		8.03%	25.15%	39.52%	43.22%	7.11%	10.65%	96.29%	1.09%	4.30%	0.32%	3.32%	7.82%	5.18%	

Sampling Results: ONP #7

				PAPER							OTHER MATERIALS						
Sample #	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other Groundwd	Paperbd	Paper Subtotal	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Other Subtotal	PRO-HIBITIVE	TOTAL
60605	Com	Fiber/TAP	ONP #7	7.18%	9.38%	45.16%	30.62%	0.29%	5.55%	98.18%	0.00%	0.77%	0.10%	0.00%	0.86%	0.96%	100.00%
60602	Com	Fiber/TAP	ONP #7	1.50%	12.47%	13.11%	37.91%	30.93%	2.64%	98.57%	0.00%	0.86%	0.14%	0.07%	1.07%	0.36%	100.00%
60601	Com	Fiber/TAP	ONP #7	4.13%	12.05%	12.11%	49.27%	15.28%	5.37%	98.21%	0.00%	0.62%	0.21%	0.14%	0.97%	0.83%	100.00%
60606	Com	Fiber/TAP	ONP #7	4.89%	6.64%	23.28%	55.18%	3.61%	4.78%	98.39%	0.05%	0.47%	0.05%	0.23%	0.79%	0.82%	100.00%
61902	Res/Com	Fiber/TAP	ONP #7	0.54%	11.51%	26.77%	57.59%	1.61%	1.35%	99.36%	0.00%	0.00%	0.03%	0.13%	0.16%	0.47%	100.00%
61901	Res/Com	Fiber/TAP	ONP #7	0.50%	10.81%	28.46%	57.77%	1.28%	0.85%	99.68%	0.00%	0.03%	0.00%	0.07%	0.10%	0.22%	100.00%
62609	Res/Com	Fiber/TAP	ONP #7	0.24%	14.78%	20.55%	58.76%	2.49%	2.17%	99.00%	0.03%	0.00%	0.00%	0.08%	0.12%	0.89%	100.00%
61903	Res/Com	Fiber/TAP	ONP #7	0.26%	11.94%	22.56%	60.99%	1.38%	1.97%	99.09%	0.07%	0.03%	0.03%	0.13%	0.25%	0.66%	100.00%
53105	Res/Com	Fiber/TAP	ONP #7	0.34%	12.26%	20.44%	62.33%	0.85%	2.38%	98.60%	0.03%	0.00%	0.00%	0.17%	0.20%	1.19%	100.00%
62608	Res/Com	Fiber/TAP	ONP #7	0.30%	12.12%	17.85%	63.65%	2.83%	2.46%	99.20%	0.00%	0.00%	0.06%	0.30%	0.36%	0.45%	100.00%
53106	Res/Com	Fiber/TAP	ONP #7	0.51%	8.17%	16.09%	68.18%	3.83%	1.92%	98.70%	0.00%	0.00%	0.03%	0.13%	0.15%	1.15%	100.00%
62607	Res/Com	Fiber/TAP	ONP #7	0.59%	10.61%	13.24%	71.29%	1.64%	1.57%	98.95%	0.20%	0.00%	0.00%	0.39%	0.59%	0.46%	100.00%
53107	Res/Com	Fiber/TAP	ONP #7	0.26%	7.98%	14.78%	72.29%	1.71%	1.32%	98.35%	0.00%	0.00%	0.00%	0.73%	0.73%	0.92%	100.00%
52805	Com	Fiber/TAP	ONP #7	4.74%	0.00%	1.09%	91.25%	0.00%	1.54%	98.62%	0.00%	0.32%	0.32%	0.10%	0.74%	0.64%	100.00%
52801	Com	Fiber/TAP	ONP #7	0.78%	0.00%	0.00%	96.30%	0.00%	2.33%	99.41%	0.00%	0.00%	0.20%	0.00%	0.20%	0.39%	100.00%
52802	Com	Fiber/TAP	ONP #7	1.80%	0.00%	0.00%	95.83%	0.00%	1.48%	99.10%	0.00%	0.19%	0.19%	0.00%	0.38%	0.51%	100.00%

ONP#7: All Mixtures (16 Samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			1.79%	8.80%	17.22%	64.33%	4.23%	2.48%	98.84%	0.02%	0.20%	0.08%	0.17%	0.48%	0.68%	100.00%
Median			0.57%	10.71%	16.97%	61.66%	1.63%	2.07%	98.82%	0.00%	0.01%	0.04%	0.13%	0.37%	0.65%	
Range	Low		0.24%	0.00%	0.00%	30.62%	0.00%	0.85%	98.18%	0.00%	0.00%	0.00%	0.00%	0.10%	0.22%	
	High		7.18%	14.78%	45.16%	96.30%	30.93%	5.55%	99.68%	0.20%	0.86%	0.32%	0.73%	1.07%	1.19%	

ONP#7: Com, Fiber/TAP (7 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			3.57%	5.79%	13.54%	65.20%	7.16%	3.38%	98.64%	0.01%	0.46%	0.17%	0.08%	0.72%	0.64%	100.00%
Median			4.13%	6.64%	12.11%	55.18%	0.29%	2.64%	98.57%	0.00%	0.47%	0.19%	0.07%	0.79%	0.64%	
Range	Low		0.78%	0.00%	0.00%	30.62%	0.00%	1.48%	98.18%	0.00%	0.00%	0.05%	0.00%	0.20%	0.36%	
	High		7.18%	12.47%	45.16%	96.30%	30.93%	5.55%	99.41%	0.05%	0.86%	0.32%	0.23%	1.07%	0.96%	

ONP#7: Com/Res, Fiber/TAP (9 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			0.39%	11.13%	20.08%	63.65%	1.96%	1.78%	98.99%	0.04%	0.01%	0.02%	0.24%	0.30%	0.71%	100.00%
Median			0.34%	11.51%	20.44%	62.33%	1.64%	1.92%	99.00%	0.00%	0.00%	0.00%	0.13%	0.20%	0.66%	
Range	Low		0.24%	7.98%	13.24%	57.59%	0.85%	0.85%	98.35%	0.00%	0.00%	0.00%	0.07%	0.10%	0.22%	
	High		0.59%	14.78%	28.46%	72.29%	3.83%	2.46%	99.68%	0.20%	0.03%	0.06%	0.73%	0.73%	1.19%	

Sampling Results of OCC

				PAPER							OTHER MATERIALS						
Sample #	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other Groundwd	Paperbd	Paper Subtotal	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Other Subtotal	PRO-HIBITIVE	TOTAL
62402	Com/Res	Fibers	OCC	38.29%	1.44%	9.21%	11.38%	3.43%	34.13%	97.88%	0.00%	0.36%	0.04%	0.09%	0.49%	1.63%	100.00%
62401	Com/Res	Fibers	OCC	43.45%	2.30%	6.23%	9.79%	2.67%	34.41%	98.85%	0.03%	0.08%	0.15%	0.23%	0.48%	0.67%	100.00%
61204	Com/Res	Fibers	OCC	48.71%	18.01%	5.79%	5.51%	1.10%	15.81%	94.93%	0.10%	0.46%	0.18%	0.65%	1.39%	3.68%	100.00%
61405	Com	Fibers	OCC	55.89%	0.50%	12.80%	1.24%	0.75%	27.57%	98.75%	0.00%	0.00%	0.38%	0.00%	0.38%	0.87%	100.00%
61812	Com	Fibers	OCC	58.10%	0.08%	20.06%	0.64%	0.84%	14.21%	93.93%	0.00%	0.00%	0.22%	0.00%	0.22%	5.85%	100.00%
61412	Com	Fibers	OCC	58.59%	1.38%	20.45%	0.39%	0.16%	18.48%	99.45%	0.00%	0.00%	0.08%	0.00%	0.08%	0.47%	100.00%
61809	Com	Fibers	OCC	62.20%	0.00%	10.90%	2.41%	0.32%	18.92%	94.75%	0.00%	0.17%	0.42%	0.06%	0.65%	4.59%	100.00%
61205	Com/Res	1-Stream	OCC	62.25%	4.60%	6.11%	4.31%	2.40%	15.81%	95.48%	0.00%	0.50%	0.00%	0.10%	0.61%	3.91%	100.00%
60311	Com	Fibers	OCC	67.32%	0.00%	3.11%	0.54%	0.00%	27.96%	98.92%	0.00%	0.00%	0.04%	0.00%	0.04%	1.04%	100.00%
61707	Com/Res	1-Stream	OCC	69.98%	1.73%	4.14%	1.93%	0.76%	20.43%	98.97%	0.03%	0.28%	0.03%	0.21%	0.54%	0.49%	100.00%
61708	Com/Res	1-Stream	OCC	70.81%	2.62%	8.00%	8.20%	0.33%	6.82%	96.78%	0.13%	0.20%	0.26%	0.26%	0.86%	2.36%	100.00%
61203	Com/Res	1-Stream	OCC	75.18%	0.79%	7.10%	5.17%	0.79%	8.94%	97.97%	0.00%	0.27%	0.00%	0.09%	0.36%	1.67%	100.00%
62410	Com/Res	Fibers	OCC	77.91%	0.34%	3.17%	1.71%	1.71%	13.36%	98.20%	0.00%	0.00%	0.09%	0.00%	0.09%	1.71%	100.00%
61001	Com	Fibers	OCC	77.98%	0.18%	1.28%	2.74%	0.37%	15.44%	97.98%	0.00%	0.00%	0.09%	0.00%	0.09%	1.92%	100.00%
62111	Com/Res	1-Stream	OCC	78.22%	0.60%	2.39%	1.88%	0.34%	14.69%	98.11%	0.17%	0.85%	0.00%	0.09%	1.11%	0.77%	100.00%
61107	Com	Fiber/TAP	OCC	78.67%	0.29%	9.42%	4.75%	1.80%	1.44%	96.37%	0.00%	0.03%	0.29%	0.07%	0.39%	3.24%	100.00%
62010	Com/Res	Fibers	OCC	81.30%	0.42%	2.50%	2.50%	0.29%	9.50%	96.50%	0.00%	0.00%	0.67%	0.00%	0.67%	2.83%	100.00%
62110	Com/Res	1-Stream	OCC	81.47%	1.17%	1.37%	2.25%	1.76%	9.38%	97.40%	0.04%	0.08%	0.00%	0.04%	0.16%	2.45%	100.00%
62011	Com/Res	Fibers	OCC	81.49%	0.06%	1.92%	3.68%	0.48%	11.03%	98.65%	0.00%	0.00%	0.08%	0.06%	0.15%	1.20%	100.00%
53104	Com/Res	Fiber/TAP	OCC	82.08%	0.14%	3.40%	0.45%	3.62%	4.60%	94.29%	0.00%	0.14%	0.00%	0.00%	0.14%	5.57%	100.00%
61709	Com/Res	1-Stream	OCC	82.84%	0.28%	3.06%	1.39%	0.93%	10.47%	98.98%	0.00%	0.00%	0.10%	0.00%	0.10%	0.93%	100.00%
62112	Com/Res	1-Stream	OCC	83.20%	0.29%	1.84%	1.77%	2.06%	7.07%	96.24%	0.00%	0.08%	0.00%	0.08%	0.15%	3.61%	100.00%
52806	Com	Fiber/TAP	OCC	83.89%	0.00%	7.22%	2.41%	0.00%	0.00%	93.52%	0.00%	0.05%	0.20%	0.05%	0.31%	6.17%	100.00%
61108	Com	Fiber/TAP	OCC	84.89%	0.49%	3.46%	4.37%	0.49%	1.38%	95.08%	0.00%	0.07%	0.42%	0.00%	0.49%	4.43%	100.00%
60608	Com	Fiber/TAP	OCC	85.96%	0.00%	0.39%	0.77%	0.29%	1.94%	89.35%	0.00%	0.00%	0.00%	0.00%	0.00%	10.65%	100.00%
60701	Com	Fibers	OCC	86.00%	0.00%	0.27%	0.07%	0.00%	10.82%	97.16%	0.00%	0.00%	0.00%	0.00%	0.00%	2.84%	100.00%
60703	Com	Fibers	OCC	86.10%	0.00%	0.41%	0.27%	0.27%	4.07%	91.12%	0.00%	0.00%	0.00%	1.02%	1.02%	7.86%	100.00%
60702	Com	Fibers	OCC	86.68%	0.09%	1.03%	0.61%	0.26%	7.58%	96.26%	0.00%	0.00%	0.00%	0.78%	0.78%	2.96%	100.00%
61003	Com	Fibers	OCC	87.21%	0.67%	0.82%	0.30%	0.97%	2.90%	92.86%	0.00%	0.00%	0.23%	0.00%	0.23%	6.91%	100.00%
60512	Com	Fibers	OCC	87.29%	0.20%	7.79%	0.11%	0.00%	4.30%	99.69%	0.00%	0.00%	0.11%	0.00%	0.11%	0.20%	100.00%
62603	Com/Res	Fiber/TAP	OCC	87.59%	0.29%	0.50%	1.22%	0.57%	6.02%	96.20%	0.00%	0.00%	0.14%	0.07%	0.22%	3.58%	100.00%
61908	Com/Res	Fiber/TAP	OCC	87.83%	0.00%	0.08%	0.00%	0.00%	11.68%	99.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	100.00%
62009	Com/Res	Fibers	OCC	88.01%	0.00%	3.78%	2.81%	4.22%	0.00%	98.82%	0.00%	0.70%	0.04%	0.00%	0.74%	0.44%	100.00%
60604	Com	Fiber/TAP	OCC	88.28%	0.00%	2.40%	0.68%	0.00%	4.71%	96.07%	0.00%	0.00%	0.00%	0.17%	0.17%	3.76%	100.00%
61103	Com	Fiber/TAP	OCC	88.88%	0.08%	0.29%	0.22%	0.00%	3.97%	93.45%	0.00%	0.00%	0.00%	0.22%	0.22%	6.33%	100.00%
52803	Com	Fiber/TAP	OCC	89.71%	0.00%	0.72%	1.00%	0.00%	1.11%	92.53%	0.00%	0.00%	0.17%	0.00%	0.17%	7.30%	100.00%
61104	Com	Fiber/TAP	OCC	89.90%	0.43%	1.15%	0.57%	0.00%	3.52%	95.57%	0.00%	0.00%	0.00%	0.06%	0.06%	4.38%	100.00%
60511	Com	Fibers	OCC	90.26%	0.00%	2.54%	0.44%	0.09%	3.15%	96.49%	0.00%	0.00%	0.18%	0.00%	0.18%	3.33%	100.00%
61505	Com/Res	Fibers	OCC	90.57%	0.00%	4.55%	0.91%	0.99%	1.74%	98.76%	0.00%	0.25%	0.33%	0.00%	0.58%	0.66%	100.00%
60510	Com	Fibers	OCC	90.57%	0.22%	3.03%	0.87%	0.11%	4.33%	99.13%	0.00%	0.00%	0.22%	0.00%	0.22%	0.65%	100.00%
62602	Com/Res	Fiber/TAP	OCC	91.11%	0.16%	5.04%	0.24%	0.08%	3.20%	99.83%	0.00%	0.00%	0.08%	0.00%	0.08%	0.08%	100.00%
61504	Com/Res	Fibers	OCC	91.21%	0.31%	2.67%	2.12%	0.40%	1.10%	97.81%	0.00%	0.55%	0.03%	0.00%	0.58%	1.60%	100.00%
62506	Com	Fibers	OCC	93.71%	0.00%	0.66%	0.56%	0.37%	3.19%	98.49%	0.00%	0.19%	0.01%	0.00%	0.19%	1.31%	100.00%
62601	Com/Res	Fiber/TAP	OCC	94.06%	0.00%	0.17%	0.00%	0.67%	4.61%	99.50%	0.00%	0.00%	0.17%	0.00%	0.17%	0.33%	100.00%
62505	Com	Fibers	OCC	94.13%	0.00%	0.57%	0.16%	0.90%	3.50%	99.27%	0.00%	0.00%	0.16%	0.00%	0.16%	0.57%	100.00%
61102	Com	Fiber/TAP	OCC	94.37%	0.10%	1.20%	0.74%	0.00%	0.74%	97.14%	0.00%	0.00%	0.10%	0.00%	0.10%	2.76%	100.00%
61907	Com/Res	Fiber/TAP	OCC	95.01%	0.00%	0.03%	0.50%	0.00%	4.46%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
61501	Com/Res	Fibers	OCC	95.37%	0.00%	1.06%	0.65%	0.32%	2.27%	99.67%	0.00%	0.00%	0.08%	0.00%	0.08%	0.25%	100.00%
61909	Com/Res	Fiber/TAP	OCC	95.72%	0.00%	0.09%	0.09%	0.00%	3.45%	99.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.66%	100.00%
61002	Com	Fibers	OCC	96.47%	0.00%	0.58%	0.22%	0.08%	0.58%	97.92%	0.00%	0.00%	0.06%	0.00%	0.06%	2.02%	100.00%
53109	Com/Res	Fiber/TAP	OCC	97.82%	0.00%	0.00%	0.00%	0.16%	1.09%	99.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.94%	100.00%
53103	Com/Res	Fiber/TAP	OCC	98.89%	0.00%	0.25%	0.00%	0.00%	0.00%	99.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.86%	100.00%

OCC: All 53 Samples			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			81.41%	0.77%	3.79%	1.88%	0.73%	8.50%	97.08%	0.01%	0.10%	0.11%	0.08%	0.31%	2.61%	100.00%
Median			86.05%	0.12%	2.45%	0.82%	0.34%	4.60%	97.90%	0.00%	0.00%	0.08%	0.00%	0.17%	1.82%	
Range	Low		38.29%	0.00%	0.00%	0.00%	0.00%	0.00%	89.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	High		98.89%	18.01%	20.45%	11.38%	4.22%	34.41%	100.00%	0.17%	0.85%	0.67%	1.02%	1.39%	10.65%	

Comm, Fibers (16 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			79.91%	0.21%	5.39%	0.72%	0.34%	10.44%	97.01%	0.00%	0.02%	0.14%	0.12%	0.28%	2.71%	100.00%
Median			86.39%	0.04%	1.91%	0.49%	0.27%	5.96%	97.95%	0.00%	0.00%	0.10%	0.00%	0.19%	1.97%	
Range	Low		55.89%	0.00%	0.27%	0.07%	0.00%	0.58%	91.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.20%	
	High		96.47%	1.38%	20.45%	2.74%	0.97%	27.96%	99.69%	0.00%	0.19%	0.38%	1.02%	1.02%	7.86%	

Com/Res, Fibers (10 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			76.40%	0.54%	3.90%	3.95%	1.61%	11.95%	98.35%	0.00%	0.22%	0.17%	0.04%	0.43%	1.22%	100.00%
Median			81.40%	0.33%	3.48%	2.65%	1.05%	10.26%	98.43%	0.00%	0.16%	0.09%	0.00%	0.54%	1.40%	
Range	Low		38.29%	0.00%	1.06%	0.65%	0.29%	0.00%	94.93%	0.00%	0.00%	0.03%	0.00%	0.08%	0.25%	
	High		95.37%	18.01%	9.21%	11.38%	4.22%	34.41%	99.67%	0.10%	0.70%	0.67%	0.65%	1.39%	3.68%	

Com, Fiber/TAP (9 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			87.17%	0.15%	2.92%	1.72%	0.29%	2.09%	94.34%	0.00%	0.02%	0.13%	0.06%	0.21%	5.45%	100.00%
Median			88.28%	0.08%	1.20%	0.77%	0.00%	1.44%	95.08%	0.00%	0.00%	0.10%	0.05%	0.17%	4.43%	
Range	Low		78.67%	0.00%	0.29%	0.22%	0.00%	0.00%	89.35%	0.00%	0.00%	0.00%	0.00%	0.00%	2.76%	
	High		94.37%	0.49%	9.42%	4.75%	1.80%	4.71%	97.14%	0.00%	0.07%	0.42%	0.22%	0.49%	10.65%	

Com/Res, Fiber/TAP (9 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			92.23%	0.07%	1.06%	0.28%	0.57%	4.35%	98.55%	0.00%	0.02%	0.04%	0.01%	0.07%	1.38%	100.00%
Median			94.06%	0.00%	0.17%	0.09%	0.08%	4.46%	99.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.66%	
Range	Low		82.08%	0.00%	0.00%	0.00%	0.00%	0.00%	94.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	High		98.89%	0.29%	5.04%	1.22%	3.62%	11.68%	100.00%	0.00%	0.14%	0.17%	0.07%	0.22%	5.57%	

Com/Res, 1-Stream (8 samples)			OCC	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			75.49%	1.51%	4.25%	3.36%	1.17%	11.70%	97.49%	0.05%	0.28%	0.05%	0.11%	0.49%	2.02%	100.00%
Median			76.70%	0.98%	3.60%	2.09%	0.86%	9.93%	97.69%	0.01%	0.23%	0.00%	0.09%	0.45%	2.01%	
Range	Low		62.25%	0.28%	1.37%	1.39%	0.33%	6.82%	95.48%	0.00%	0.00%	0.00%	0.00%	0.10%	0.49%	
	High		62.25%	0.28%	1.37%	1.39%	0.33%	6.82%	95.48%	0.00%	0.00%	0.00%	0.00%	0.10%	0.49%	

Sampling Results: Wh.Ledger

				PAPER									OTHER MATERIALS						
Sample #	Material Source	Material Mixture	Product Sampled	OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other Groundwd	Paperbd	Paper Subtotal	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Other Subtotal	PRO-HIBITIVE	TOTAL
61506	Com/Res	Fibers	Wh.Ledger	5.10%	84.95%	3.52%	0.18%	1.06%	2.46%	0.44%	1.58%	99.29%	0.00%	0.18%	0.09%	0.00%	0.27%	0.44%	100.00%
62006	Com/Res	Fibers	Wh.Ledger	7.38%	85.37%	1.20%	0.55%	0.74%	2.58%	0.65%	0.46%	98.94%	0.01%	0.10%	0.00%	0.04%	0.14%	0.92%	100.00%
61508	Com/Res	Fibers	Wh.Ledger	1.71%	87.13%	2.29%	0.86%	0.86%	2.00%	1.14%	0.57%	96.56%	0.00%	0.57%	0.15%	0.15%	0.87%	2.57%	100.00%
61507	Com/Res	Fibers	Wh.Ledger	2.53%	87.40%	1.27%	0.46%	1.27%	3.89%	1.18%	0.82%	98.82%	0.00%	0.54%	0.18%	0.00%	0.72%	0.46%	100.00%
62405	Com/Res	Fibers	Wh.Ledger	0.56%	88.54%	1.25%	0.21%	2.23%	4.94%	0.91%	0.63%	99.27%	0.00%	0.07%	0.03%	0.00%	0.10%	0.63%	100.00%
62409	Com/Res	Fibers	Wh.Ledger	2.55%	91.05%	0.40%	0.08%	0.24%	1.28%	2.23%	1.52%	99.36%	0.00%	0.16%	0.00%	0.08%	0.24%	0.40%	100.00%
62007	Com/Res	Fibers	Wh.Ledger	0.49%	91.34%	1.47%	0.65%	1.47%	3.52%	0.25%	0.33%	99.54%	0.00%	0.09%	0.13%	0.00%	0.22%	0.25%	100.00%
60501	Com	Fibers	Wh.Ledger	0.04%	92.11%	0.47%	0.47%	5.53%	0.19%	0.04%	0.00%	98.84%	0.00%	0.00%	0.04%	0.00%	0.04%	1.12%	100.00%
61408	Com	Fibers	Wh.Ledger	0.20%	93.61%	0.75%	0.15%	0.75%	0.00%	4.51%	0.01%	99.97%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	100.00%
62408	Com/Res	Fibers	Wh.Ledger	0.50%	96.27%	0.33%	0.09%	0.33%	1.57%	0.42%	0.42%	99.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.09%	100.00%
60404	Comm	Fibers	Wh.Ledger	0.00%	96.37%	0.92%	0.46%	1.92%	0.00%	0.00%	0.03%	99.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	100.00%
60303	Comm	Fibers	Wh.Ledger	0.06%	96.50%	0.22%	0.43%	1.25%	0.32%	0.04%	0.04%	98.86%	0.00%	0.00%	0.00%	0.00%	0.00%	1.14%	100.00%
62406	Com/Res	Fibers	Wh.Ledger	0.08%	97.02%	0.79%	0.32%	0.48%	1.03%	0.08%	0.08%	99.89%	0.00%	0.00%	0.03%	0.00%	0.03%	0.08%	100.00%
61406	Com	Fibers	Wh.Ledger	0.00%	97.02%	1.01%	0.29%	0.00%	0.51%	0.87%	0.14%	99.84%	0.00%	0.00%	0.02%	0.00%	0.02%	0.14%	100.00%
61407	Com	Fibers	Wh.Ledger	0.00%	97.05%	1.12%	0.14%	0.00%	0.35%	1.12%	0.00%	99.78%	0.00%	0.00%	0.01%	0.01%	0.01%	0.21%	100.00%
61409	Com	Fibers	Wh.Ledger	0.00%	97.33%	1.50%	0.00%	0.00%	0.35%	0.60%	0.08%	99.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	100.00%
61804	Com	Fibers	Wh.Ledger	0.00%	97.56%	0.34%	0.34%	0.84%	0.34%	0.09%	0.34%	99.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.17%	100.00%
61803	Com	Fibers	Wh.Ledger	0.17%	97.94%	0.33%	0.09%	0.17%	0.09%	0.42%	0.67%	99.88%	0.00%	0.00%	0.03%	0.00%	0.03%	0.09%	100.00%
60301	Com	Fibers	Wh.Ledger	0.08%	98.09%	0.22%	0.37%	0.58%	0.37%	0.01%	0.03%	99.74%	0.00%	0.00%	0.03%	0.03%	0.06%	0.20%	100.00%
60405	Com	Fibers	Wh.Ledger	0.00%	98.35%	0.44%	0.27%	0.79%	0.00%	0.00%	0.07%	99.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	100.00%
60310	Com	Fibers	Wh.Ledger	0.51%	98.41%	0.44%	0.00%	0.44%	0.07%	0.00%	0.00%	99.87%	0.00%	0.00%	0.00%	0.00%	0.00%	0.13%	100.00%
60302	Com	Fibers	Wh.Ledger	0.09%	98.55%	0.09%	0.00%	0.35%	0.53%	0.18%	0.04%	99.82%	0.00%	0.00%	0.01%	0.00%	0.01%	0.18%	100.00%
60506	Com	Fibers	Wh.Ledger	0.00%	98.78%	0.09%	0.00%	0.44%	0.00%	0.00%	0.00%	99.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	100.00%
60406	Com	Fibers	Wh.Ledger	0.00%	98.83%	0.39%	0.00%	0.58%	0.00%	0.00%	0.10%	99.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	100.00%
61801	Com	Fibers	Wh.Ledger	0.07%	98.85%	0.36%	0.00%	0.21%	0.21%	0.07%	0.07%	99.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	100.00%
61802	Com	Fibers	Wh.Ledger	0.00%	99.53%	0.07%	0.07%	0.07%	0.07%	0.00%	0.00%	99.83%	0.00%	0.00%	0.00%	0.03%	0.03%	0.14%	100.00%

Wh.Ledger, All Mixtures (26 samples)			OCC	Wh. Ledg	Col. Ledg	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			0.85%	94.77%	0.82%	0.25%	0.87%	1.03%	0.59%	0.31%	99.48%	0.00%	0.07%	0.03%	0.01%	0.11%	0.42%	100.00%
Median			0.08%	97.02%	0.46%	0.19%	0.58%	0.35%	0.21%	0.08%	99.80%	0.00%	0.00%	0.00%	0.00%	0.01%	0.19%	
Range	Low		0.00%	84.95%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	96.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	
	High		7.38%	99.53%	3.52%	0.86%	5.53%	4.94%	4.51%	1.58%	99.97%	0.01%	0.57%	0.18%	0.15%	0.87%	2.57%	

Com, Fiber (14 samples)			OCC	Wh. Ledg	Col. Ledg	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			0.07%	97.35%	0.52%	0.18%	0.82%	0.20%	0.47%	0.10%	99.69%	0.00%	0.00%	0.01%	0.00%	0.01%	0.29%	100.00%
Median			0.00%	97.94%	0.39%	0.14%	0.44%	0.19%	0.04%	0.04%	99.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	
Range	Low		0.00%	92.11%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	98.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	
	High		0.51%	99.53%	1.50%	0.47%	5.53%	0.53%	4.51%	0.67%	99.97%	0.00%	0.00%	0.04%	0.03%	0.06%	1.14%	

Com/Res, Fiber			OCC	Wh. Ledg	Col. Ledg	Mags	MSP	ONP	Groundwd	Paperbd	PaperSub	Glass	PlasBots	PlasFilm	Metal	Oth,Sub	Prohibs	TOTAL
Average			2.32%	89.90%	1.39%	0.38%	0.96%	2.59%	0.81%	0.71%	99.06%	0.00%	0.19%	0.07%	0.03%	0.29%	0.65%	100.00%
Median			1.71%	88.54%	1.25%	0.32%	0.86%	2.46%	0.65%	0.57%	99.29%	0.00%	0.10%	0.03%	0.00%	0.22%	0.44%	
Range	Low		0.08%	84.95%	0.33%	0.08%	0.24%	1.03%	0.08%	0.08%	96.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.08%	
	High		7.38%	97.02%	3.52%	0.86%	2.23%	4.94%	2.23%	1.58%	99.91%	0.01%	0.57%	0.18%	0.15%	0.87%	2.57%	

APPENDIX G

PROCESSOR SAMPLING RESULTS

Sampling Results at Processor A

					PAPER											OTHER MATERIALS									
Sample #	Facility Name	Material Source	Material Mix	Product Sampled	OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other GroundW	Paperbd	Other	**Paper Subtotal**		Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**		**PRO-HIBITIVE**		TOTAL		Sample Weight
60308	Proc A	Com	Fibers	Residue	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	20.73%	0.77%	21.50%		78.50%		100.00%		16.88
60312	Proc A	Com	Fibers	Residue	0.00%	0.00%	0.00%	0.00%	17.48%	1.75%	0.00%	0.00%	0.00%	19.23%		48.25%	1.75%	0.00%	4.55%	54.55%		26.22%		100.00%		2.86
61410	Proc A	Com	Fibers	Residue	0.25%	0.00%	0.00%	7.14%	2.08%	0.10%	0.20%	0.79%	0.00%	10.56%		8.13%	0.99%	3.47%	2.18%	14.77%		74.66%		100.00%		252.13
61411	Proc A	Com	Fibers	Residue	3.91%	0.00%	0.00%	0.36%	2.14%	0.71%	0.00%	0.36%	0.00%	7.47%		4.63%	0.36%	0.00%	8.54%	13.52%		79.00%		100.00%		70.25
61810	Proc A	Com	Fibers	Residue	0.30%	0.00%	0.00%	0.20%	16.07%	0.60%	0.20%	1.10%	0.00%	18.47%		10.18%	2.30%	0.80%	2.20%	15.47%		66.06%		100.00%		125.27
61811	Proc A	Com	Fibers	Residue	0.00%	0.00%	0.00%	0.00%	8.08%	0.00%	0.00%	1.07%	0.00%	9.15%		15.04%	3.78%	0.56%	7.00%	26.39%		64.46%		100.00%		23.27
60311	Proc A	Com	Fibers	OCC	67.32%	0.00%	0.00%	0.00%	3.11%	0.54%	0.00%	27.96%	0.00%	98.92%		0.00%	0.00%	0.04%	0.00%	0.04%		1.04%		100.00%		24.14
61405	Proc A	Com	Fibers	OCC	55.89%	0.00%	0.00%	0.50%	12.80%	1.24%	0.75%	27.57%	0.00%	98.75%		0.00%	0.00%	0.38%	0.00%	0.38%		0.87%		100.00%		100.64
61412	Proc A	Com	Fibers	OCC	58.59%	0.00%	0.00%	1.38%	20.45%	0.39%	0.16%	18.48%	0.00%	99.45%		0.00%	0.00%	0.08%	0.00%	0.08%		0.47%		100.00%		63.58
61809	Proc A	Com	Fibers	OCC	62.20%	0.00%	0.00%	0.00%	10.90%	2.41%	0.32%	18.92%	0.00%	94.75%		0.00%	0.17%	0.42%	0.06%	0.65%		4.59%		100.00%		77.97
61812	Proc A	Com	Fibers	OCC	58.10%	0.00%	0.00%	0.08%	20.06%	0.64%	0.84%	14.21%	0.00%	93.93%		0.00%	0.00%	0.22%	0.00%	0.22%		5.85%		100.00%		59.81
60304	Proc A	Com	Fibers	ONP #6	2.45%	0.00%	0.00%	20.53%	41.35%	29.25%	3.53%	0.94%	0.00%	98.05%		0.00%	0.07%	0.07%	0.22%	0.37%		1.58%		100.00%		173.53
60305	Proc A	Com	Fibers	ONP #6	1.38%	0.00%	0.00%	28.02%	50.09%	11.15%	7.38%	0.43%	0.00%	98.45%		0.03%	0.00%	0.08%	0.00%	0.10%		1.45%		100.00%		172.69
60306	Proc A	Com	Fibers	ONP #6	1.44%	0.00%	0.00%	31.99%	41.98%	19.55%	2.66%	0.58%	0.00%	98.20%		0.00%	0.00%	0.07%	0.00%	0.07%		1.73%		100.00%		173.89
60307	Proc A	Com	Fibers	ONP #6	1.08%	0.00%	0.00%	26.99%	45.34%	19.79%	3.42%	0.63%	0.00%	97.26%		0.00%	0.00%	0.09%	0.04%	0.13%		2.61%		100.00%		138.94
60309	Proc A	Com	Fibers	ONP #6	0.54%	0.00%	0.00%	34.70%	39.33%	14.97%	8.08%	0.83%	0.00%	98.45%		0.00%	0.00%	0.06%	0.00%	0.06%		1.49%		100.00%		210.39
61401	Proc A	Com	Fibers	ONP #6	0.14%	0.00%	0.00%	20.97%	66.84%	9.29%	1.17%	0.41%	0.00%	98.82%		0.00%	0.00%	0.03%	0.00%	0.03%		1.16%		100.00%		181.79
61402	Proc A	Com	Fibers	ONP #6	0.00%	0.00%	0.00%	31.65%	49.23%	13.80%	3.70%	0.68%	0.00%	99.05%		0.00%	0.00%	0.07%	0.00%	0.07%		0.88%		100.00%		184.84
61403	Proc A	Com	Fibers	ONP #6	0.37%	0.00%	0.00%	11.04%	68.29%	16.57%	0.55%	1.39%	0.00%	98.21%		0.74%	0.00%	0.18%	0.04%	0.96%		0.83%		100.00%		135.82
61404	Proc A	Com	Fibers	ONP #6	0.08%	0.00%	0.00%	13.55%	73.70%	8.22%	1.98%	1.07%	0.00%	98.59%		0.54%	0.00%	0.00%	0.03%	0.57%		0.84%		100.00%		164.19
61805	Proc A	Com	Fibers	ONP #6	0.71%	0.00%	0.00%	17.07%	59.93%	15.42%	4.42%	0.53%	0.00%	98.09%		0.02%	0.00%	0.06%	0.00%	0.08%		1.83%		100.00%		212.32
61806	Proc A	Com	Fibers	ONP #6	1.14%	0.00%	0.00%	16.34%	58.00%	17.14%	3.82%	1.61%	0.00%	98.05%		0.00%	0.13%	0.07%	0.01%	0.21%		1.74%		100.00%		186.65
61807	Proc A	Com	Fibers	ONP #6	0.37%	0.00%	0.00%	17.47%	59.47%	15.02%	5.43%	0.82%	0.00%	98.58%		0.00%	0.08%	0.08%	0.00%	0.15%		1.27%		100.00%		168.16
61808	Proc A	Com	Fibers	ONP #6	0.31%	0.00%	0.00%	13.74%	64.56%	16.48%	2.22%	1.37%	0.00%	98.67%		0.00%	0.08%	0.03%	0.00%	0.11%		1.22%		100.00%		163.81
60301	Proc A	Com	Fibers	Wh.Ldger	0.08%	98.09%	0.22%	0.37%	0.58%	0.37%	0.01%	0.03%	0.00%	99.74%		0.00%	0.00%	0.03%	0.03%	0.06%		0.20%		100.00%		172.29
60302	Proc A	Com	Fibers	Wh.Ldger	0.09%	98.55%	0.09%	0.00%	0.35%	0.53%	0.18%	0.04%	0.00%	99.82%		0.00%	0.00%	0.01%	0.00%	0.01%		0.18%		100.00%		142.57
60303	Proc A	Com	Fibers	Wh.Ldger	0.06%	96.50%	0.22%	0.43%	1.25%	0.32%	0.04%	0.04%	0.00%	98.86%		0.00%	0.00%	0.00%	0.00%	0.00%		1.14%		100.00%		231.10
60310	Proc A	Com	Fibers	Wh.Ldger	0.51%	98.41%	0.44%	0.00%	0.44%	0.07%	0.00%	0.00%	0.00%	99.87%		0.00%	0.00%	0.00%	0.00%	0.00%		0.13%		100.00%		197.89
61406	Proc A	Com	Fibers	Wh.Ldger	0.00%	97.02%	1.01%	0.29%	0.00%	0.51%	0.87%	0.14%	0.00%	99.84%		0.00%	0.00%	0.02%	0.00%	0.02%		0.14%		100.00%		173.16
61407	Proc A	Com	Fibers	Wh.Ldger	0.00%	97.05%	1.12%	0.14%	0.00%	0.35%	1.12%	0.00%	0.00%	99.78%		0.00%	0.00%	0.01%	0.01%	0.01%		0.21%		100.00%		178.78
61408	Proc A	Com	Fibers	Wh.Ldger	0.20%	93.61%	0.75%	0.15%	0.75%	0.00%	4.51%	0.01%	0.00%	99.97%		0.00%	0.00%	0.00%	0.00%	0.00%		0.03%		100.00%		166.39
61409	Proc A	Com	Fibers	Wh.Ldger	0.00%	97.33%	1.50%	0.00%	0.00%	0.35%	0.60%	0.08%	0.00%	99.86%		0.00%	0.00%	0.00%	0.00%	0.00%		0.14%		100.00%		166.44
61801	Proc A	Com	Fibers	Wh.Ldger	0.07%	98.85%	0.36%	0.00%	0.21%	0.21%	0.07%	0.07%	0.00%	99.86%		0.00%	0.00%	0.00%	0.00%	0.00%		0.14%		100.00%		176.78
61802	Proc A	Com	Fibers	Wh.Ldger	0.00%	99.53%	0.07%	0.07%	0.07%	0.07%	0.00%	0.00%	0.00%	99.83%		0.00%	0.00%	0.00%	0.03%	0.03%		0.14%		100.00%		175.57
61803	Proc A	Com	Fibers	Wh.Ldger	0.17%	97.94%	0.33%	0.09%	0.17%	0.09%	0.42%	0.67%	0.00%	99.88%		0.00%	0.00%	0.03%	0.00%	0.03%		0.09%		100.00%		149.32
61804	Proc A	Com	Fibers	Wh.Ldger	0.00%	97.56%	0.34%	0.34%	0.84%	0.34%	0.09%	0.34%	0.00%	99.83%		0.00%	0.00%	0.00%	0.00%	0.00%		0.17%		100.00%		148.88

Average by Commodity

	OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other Groundwd	Paper-board	Other	**Paper Subtotal**		Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**		**PROHI-BITIVES**		TOTAL		Sample Weight
Residue	0.74%	0.00%	0.00%	1.28%	7.64%	0.53%	0.07%	0.55%	0.00%	10.82%		14.37%	1.53%	4.26%	4.21%	24.37%		64.82%		100.00%		81.78
OCC	60.42%	0.00%	0.00%	0.39%	13.46%	1.04%	0.41%	21.43%	0.00%	97.16%		0.00%	0.03%	0.23%	0.01%	0.27%		2.57%		100.00%		65.23
ONP#6	0.77%	0.00%	0.00%	21.85%	55.24%	15.90%	3.72%	0.87%	0.00%	98.34%		0.10%	0.03%	0.07%	0.03%	0.22%		1.43%		100.00%		174.39
White Ledger	0.10%	97.54%	0.54%	0.16%	0.39%	0.27%	0.66%	0.12%	0.00%	99.76%		0.00%	0.00%	0.01%	0.01%	0.01%		0.23%		100.00%		173.26

Median by Commodity

Residue	0.12%	0.00%	0.00%	0.10%	5.11%	0.35%	0.00%	0.57%	0.00%	9.86%		9.15%	1.37%	0.68%	3.37%	18.49%		70.36%		100.00%		46.76
OCC	58.59%	0.00%	0.00%	0.08%	12.80%	0.64%	0.32%	18.92%	0.00%	98.75%		0.00%	0.00%	0.22%	0.00%	0.22%		1.04%		100.00%		63.58
ONP#6	0.54%	0.00%	0.00%	20.53%	58.00%	15.42%	3.53%	0.82%	0.00%	98.45%		0.00%	0.00%	0.07%	0.00%	0.11%		1.45%		100.00%		173.53
White Ledger	0.06%	97.75%	0.35%	0.11%	0.28%	0.33%	0.13%	0.04%	0.00%	99.84%		0.00%	0.00%	0.00%	0.00%	0.01%		0.14%		100.00%		172.73

Range by Commodity

Residue																					
Low	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	0.77%	13.52%		26.22%		100.00%		2.86
High	3.91%	0.00%	0.00%	7.14%	17.48%	1.75%	0.20%	1.10%	0.00%	19.23%		48.25%	3.78%	20.73%	8.54%	54.55%		79.00%		100.00%		252.13
OCC																					
Low	55.89%	0.00%	0.00%	0.00%	3.11%	0.39%	0.00%	14.21%	0.00%	93.93%		0.00%	0.00%	0.04%	0.00%	0.04%		0.47%		100.00%		24.14
High	67.32%	0.00%	0.00%	1.38%	20.45%	2.41%	0.84%	27.96%	0.00%	99.45%		0.00%	0.17%	0.42%	0.06%	0.65%		5.85%		100.00%		100.64
ONP#6																					
Low	0.00%	0.00%	0.00%	11.04%	39.33%	8.22%	0.55%	0.41%	0.00%	97.26%		0.00%	0.00%	0.00%	0.00%	0.03%		0.83%		100.00%		135.82
High	2.45%	0.00%	0.00%	34.70%	73.70%	29.25%	8.08%	1.61%	0.00%	99.05%		0.74%	0.13%	0.18%	0.22%	0.96%		2.61%		100.00%		212.32
White Ledger																					
Low	0.00%	93.61%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	98.86%		0.00%	0.00%	0.00%	0.00%	0.00%		0.03%		100.00%		142.57
High	0.51%	99.53%	1.50%	0.43%	1.25%	0.53%	4.51%	0.67%	0.00%	99.97%		0.00%	0.00%	0.03%	0.03%	0.06%		1.14%		100.00%		231.10

Sampling Results at Processor B

					PAPER								OTHER MATERIALS							
Sample #	Facility Name	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other GroundW	Paperbd	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PRO-HIBITIVES**	TOTAL	Sample Weight
60609	Proc B	Com	Fibers/TAP	Residue	1.67%	1.23%	0.13%	1.42%	0.00%	2.32%	0.00%	6.76%	9.39%	3.47%	2.70%	1.87%	17.44%	75.80%	100.00%	194.26
61110	Proc B	Com	Fibers/TAP	Residue	1.94%	0.00%	0.81%	0.54%	1.51%	3.95%	0.00%	8.76%	8.10%	0.92%	0.92%	5.13%	15.08%	76.17%	100.00%	231.40
61111	Proc B	Com	Fibers/TAP	Residue	0.26%	0.00%	1.03%	0.26%	0.00%	0.26%	0.00%	1.80%	15.68%	0.77%	0.26%	7.46%	24.16%	74.04%	100.00%	97.25
52804	Proc B	Com	Fibers/TAP	MOP **	2.47%	0.00%	84.68%	0.00%	0.00%	1.06%	0.00%	88.21%	0.86%	3.83%	0.25%	2.27%	7.21%	4.58%	100.00%	248.28
60603	Proc B	Com	Fibers/TAP	MOP **	1.16%	6.51%	55.19%	21.67%	2.17%	4.33%	0.00%	91.03%	0.87%	2.31%	0.15%	1.31%	4.63%	4.33%	100.00%	86.52
61101	Proc B	Com	Fibers/TAP	MOP **	1.46%	18.05%	63.16%	1.46%	8.54%	1.46%	0.00%	94.14%	0.00%	1.35%	0.24%	0.13%	1.72%	4.15%	100.00%	102.51
61105	Proc B	Com	Fibers/TAP	MOP **	3.06%	12.12%	63.76%	9.69%	2.55%	1.53%	0.00%	92.72%	0.00%	4.08%	0.13%	0.90%	5.11%	2.17%	100.00%	98.02
61106	Proc B	Com	Fibers/TAP	MOP **	2.26%	8.70%	55.12%	10.64%	5.65%	2.26%	0.00%	84.62%	0.00%	5.16%	0.06%	1.46%	6.68%	8.70%	100.00%	77.56
61109	Proc B	Com	Fibers/TAP	MOP **	4.42%	14.41%	31.50%	34.96%	7.78%	4.99%	0.00%	98.07%	0.00%	0.77%	0.10%	0.58%	1.44%	0.48%	100.00%	130.14
52803	Proc B	Com	Fibers/TAP	OCC	89.71%	0.00%	0.72%	1.00%	0.00%	1.11%	0.00%	92.53%	0.00%	0.00%	0.17%	0.00%	0.17%	7.30%	100.00%	226.01
52806	Proc B	Com	Fibers/TAP	OCC	83.89%	0.00%	7.22%	2.41%	0.00%	0.00%	0.00%	93.52%	0.00%	0.05%	0.20%	0.05%	0.31%	6.17%	100.00%	249.14
60604	Proc B	Com	Fibers/TAP	OCC	88.28%	0.00%	2.40%	0.68%	0.00%	4.71%	0.00%	96.07%	0.00%	0.00%	0.00%	0.17%	0.17%	3.76%	100.00%	146.13
60608	Proc B	Com	Fibers/TAP	OCC	85.96%	0.00%	0.39%	0.77%	0.29%	1.94%	0.00%	89.35%	0.00%	0.00%	0.00%	0.00%	0.00%	10.65%	100.00%	129.13
61102	Proc B	Com	Fibers/TAP	OCC	94.37%	0.10%	1.20%	0.74%	0.00%	0.74%	0.00%	97.14%	0.00%	0.00%	0.10%	0.00%	0.10%	2.76%	100.00%	135.64
61103	Proc B	Com	Fibers/TAP	OCC	88.88%	0.08%	0.29%	0.22%	0.00%	3.97%	0.00%	93.45%	0.00%	0.00%	0.00%	0.22%	0.22%	6.33%	100.00%	169.89
61104	Proc B	Com	Fibers/TAP	OCC	89.90%	0.43%	1.15%	0.57%	0.00%	3.52%	0.00%	95.57%	0.00%	0.00%	0.00%	0.06%	0.06%	4.38%	100.00%	174.36
61107	Proc B	Com	Fibers/TAP	OCC	78.67%	0.29%	9.42%	4.75%	1.80%	1.44%	0.00%	96.37%	0.00%	0.03%	0.29%	0.07%	0.39%	3.24%	100.00%	173.82
61108	Proc B	Com	Fibers/TAP	OCC	84.89%	0.49%	3.46%	4.37%	0.49%	1.38%	0.00%	95.08%	0.00%	0.07%	0.42%	0.00%	0.49%	4.43%	100.00%	180.52
52801	Proc B	Com	Fibers/TAP	ONP #7	0.78%	0.00%	0.00%	96.30%	0.00%	2.33%	0.00%	99.41%	0.00%	0.00%	0.20%	0.00%	0.20%	0.39%	100.00%	64.38
52802	Proc B	Com	Fibers/TAP	ONP #7	1.80%	0.00%	0.00%	95.83%	0.00%	1.48%	0.00%	99.10%	0.00%	0.19%	0.19%	0.00%	0.38%	0.51%	100.00%	194.88
52805	Proc B	Com	Fibers/TAP	ONP #7	4.74%	0.00%	1.09%	91.25%	0.00%	1.54%	0.00%	98.62%	0.00%	0.32%	0.32%	0.10%	0.74%	0.64%	100.00%	390.13
60601	Proc B	Com	Fibers/TAP	ONP #7	4.13%	12.05%	12.11%	49.27%	15.28%	5.37%	0.00%	98.21%	0.00%	0.62%	0.21%	0.14%	0.97%	0.83%	100.00%	181.64
60602	Proc B	Com	Fibers/TAP	ONP #7	1.50%	12.47%	13.11%	37.91%	30.93%	2.64%	0.00%	98.57%	0.00%	0.86%	0.14%	0.07%	1.07%	0.36%	100.00%	175.40
60605	Proc B	Com	Fibers/TAP	ONP #7	7.18%	9.38%	45.16%	30.62%	0.29%	5.55%	0.00%	98.18%	0.00%	0.77%	0.10%	0.00%	0.86%	0.96%	100.00%	130.64
60606	Proc B	Com	Fibers/TAP	ONP #7	4.89%	6.64%	23.28%	55.18%	3.61%	4.78%	0.00%	98.39%	0.05%	0.47%	0.05%	0.23%	0.79%	0.82%	100.00%	107.37
52807	Proc B	Com	Fibers/TAP	Pprbd/OCC	86.35%	0.00%	2.85%	2.14%	0.00%	6.16%	0.00%	97.50%	0.00%	0.00%	0.36%	0.00%	0.36%	2.14%	100.00%	140.13
60607	Proc B	Com	Fibers/TAP	Pprbd/OCC	64.58%	0.08%	2.17%	3.42%	1.79%	25.07%	0.00%	97.11%	0.01%	0.00%	0.01%	0.78%	0.79%	2.10%	100.00%	161.04

**** Reloaded for additional sorting at another processor.**

Average by Commodity

	OCC	Mags	MSP	ONP	Other Groundwd	Paper-board	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PROHI-BITIVES**	TOTAL	Sample Weight
Residue	1.29%	0.41%	0.66%	0.74%	0.50%	2.17%	0.00%	5.77%	11.06%	1.72%	1.29%	4.82%	18.89%	75.33%	100.00%	174.30
MOP **	2.47%	9.96%	58.90%	13.07%	4.45%	2.61%	0.00%	91.46%	0.29%	2.92%	0.16%	1.11%	4.47%	4.07%	100.00%	123.84
OCC	87.17%	0.15%	2.92%	1.72%	0.29%	2.09%	0.00%	94.34%	0.00%	0.02%	0.13%	0.06%	0.21%	5.45%	100.00%	176.07
ONP #7	3.57%	5.79%	13.54%	65.20%	7.16%	3.38%	0.00%	98.64%	0.01%	0.46%	0.17%	0.08%	0.72%	0.64%	100.00%	177.78
Paperboard/OCC Mix	75.46%	0.04%	2.51%	2.78%	0.89%	15.62%	0.00%	97.31%	0.00%	0.00%	0.18%	0.39%	0.57%	2.12%	100.00%	150.59

Median by Commodity

Residue	1.67%	0.00%	0.81%	0.54%	0.00%	2.32%	0.00%	6.76%	9.39%	0.92%	0.92%	5.13%	17.44%	75.80%	100.00%	194.26
MOP **	2.36%	10.41%	59.18%	10.16%	4.10%	1.89%	0.00%	91.87%	0.00%	3.07%	0.14%	1.10%	4.87%	4.24%	100.00%	100.27
OCC	88.28%	0.08%	1.20%	0.77%	0.00%	1.44%	0.00%	95.08%	0.00%	0.00%	0.10%	0.05%	0.17%	4.43%	100.00%	173.82
ONP #7	4.13%	6.64%	12.11%	55.18%	0.29%	2.64%	0.00%	98.57%	0.00%	0.47%	0.19%	0.07%	0.79%	0.64%	100.00%	175.40
Paperboard/OCC Mix	75.46%	0.04%	2.51%	2.78%	0.89%	15.62%	0.00%	97.31%	0.00%	0.00%	0.18%	0.39%	0.57%	2.12%	100.00%	150.59

Range by Commodity

Residue																
Low	0.26%	0.00%	0.13%	0.26%	0.00%	0.26%	0.00%	1.80%	8.10%	0.77%	0.26%	1.87%	15.08%	74.04%	100.00%	97.25
High	1.94%	1.23%	1.03%	1.42%	1.51%	3.95%	0.00%	8.76%	15.68%	3.47%	2.70%	7.46%	24.16%	76.17%	100.00%	231.40
MOP **																
Low	1.16%	0.00%	31.50%	0.00%	0.00%	1.06%	0.00%	84.62%	0.00%	0.77%	0.06%	0.13%	1.44%	0.48%	100.00%	77.56
High	4.42%	18.05%	84.68%	34.96%	8.54%	4.99%	0.00%	98.07%	0.87%	5.16%	0.25%	2.27%	7.21%	8.70%	100.00%	248.28
OCC																
Low	78.67%	0.00%	0.29%	0.22%	0.00%	0.00%	0.00%	89.35%	0.00%	0.00%	0.00%	0.00%	0.00%	2.76%	100.00%	129.13
High	94.37%	0.49%	9.42%	4.75%	1.80%	4.71%	0.00%	97.14%	0.00%	0.07%	0.42%	0.22%	0.49%	10.65%	100.00%	249.14
ONP #7																
Low	0.78%	0.00%	0.00%	30.62%	0.00%	1.48%	0.00%	98.18%	0.00%	0.00%	0.05%	0.00%	0.20%	0.36%	100.00%	64.38
High	7.18%	12.47%	45.16%	96.30%	30.93%	5.55%	0.00%	99.41%	0.05%	0.86%	0.32%	0.23%	1.07%	0.96%	100.00%	390.13
Paperboard/OCC Mix																
Low	64.58%	0.00%	2.17%	2.14%	0.00%	6.16%	0.00%	97.11%	0.00%	0.00%	0.01%	0.00%	0.36%	2.10%	100.00%	140.13
High	86.35%	0.08%	2.85%	3.42%	1.79%	25.07%	0.00%	97.50%	0.01%	0.00%	0.36%	0.78%	0.79%	2.14%	100.00%	161.04

Sampling Results at Processor C

					PAPER								OTHER MATERIALS							
Sample #	Facility Name	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other GroundW	Paperbd	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PRO-HIBITIVE**	TOTAL	Sample Weight
53101	Proc C	Com/Res	Fibers/TAP	Residue	3.85%	0.00%	1.28%	0.00%	0.00%	0.00%	0.00%	5.13%	0.00%	0.64%	0.00%	2.68%	3.32%	91.55%	100.00%	116.88
53102	Proc C	Com/Res	Fibers/TAP	Residue	0.77%	0.00%	1.10%	0.00%	0.00%	0.00%	0.00%	1.87%	0.00%	1.15%	0.00%	1.34%	2.49%	95.64%	100.00%	130.44
53108	Proc C	Com/Res	Fibers/TAP	Residue	3.30%	0.29%	4.16%	39.19%	0.46%	0.34%	1.21%	48.96%	0.00%	0.14%	0.00%	0.07%	0.22%	50.82%	100.00%	174.13
61904	Proc C	Com/Res	Fibers/TAP	Residue	1.94%	9.64%	34.77%	3.18%	18.83%	4.92%	0.00%	73.28%	0.00%	0.40%	0.60%	0.00%	0.99%	25.73%	100.00%	251.64
61905	Proc C	Com/Res	Fibers/TAP	Residue	0.74%	1.63%	36.06%	2.79%	12.14%	1.47%	0.00%	54.83%	0.00%	1.11%	0.95%	0.02%	2.07%	43.10%	100.00%	237.82
61906	Proc C	Com/Res	Fibers/TAP	Residue	1.36%	0.12%	2.26%	2.04%	0.12%	1.70%	0.00%	7.60%	0.00%	0.23%	28.31%	2.72%	31.25%	61.15%	100.00%	110.39
62610	Proc C	Com/Res	Fibers/TAP	Residue	0.37%	0.10%	1.56%	4.85%	0.10%	0.28%	0.00%	7.24%	0.01%	0.10%	29.63%	2.38%	32.11%	60.64%	100.00%	136.67
62611	Proc C	Com/Res	Fibers/TAP	Residue	0.62%	0.15%	0.93%	1.39%	0.31%	0.70%	0.00%	4.10%	0.31%	1.54%	21.78%	1.39%	25.02%	70.89%	100.00%	161.88
62612	Proc C	Com/Res	Fibers/TAP	Residue	14.23%	0.62%	2.38%	4.22%	0.00%	5.45%	0.00%	26.89%	0.00%	0.35%	2.11%	1.05%	3.51%	69.59%	100.00%	142.26
53110	Proc C	Com/Res	Fibers/TAP	MSP **	46.78%	0.42%	4.20%	3.92%	2.24%	34.15%	0.00%	91.71%	0.00%	0.14%	0.00%	0.14%	0.28%	8.01%	100.00%	178.50
53111	Proc C	Com/Res	Fibers/TAP	MSP **	41.67%	0.97%	9.16%	5.45%	5.06%	33.69%	0.00%	96.01%	0.10%	0.19%	0.00%	0.00%	0.29%	3.70%	100.00%	128.39
61910	Proc C	Com/Res	Fibers/TAP	MSP **	48.38%	1.12%	4.08%	2.63%	7.49%	30.10%	0.00%	93.80%	0.00%	0.00%	0.03%	0.39%	0.42%	5.78%	100.00%	190.18
61911	Proc C	Com/Res	Fibers/TAP	MSP **	42.54%	2.76%	7.68%	2.61%	11.06%	29.48%	0.00%	96.13%	0.00%	0.46%	0.00%	0.03%	0.49%	3.38%	100.00%	162.80
61912	Proc C	Com/Res	Fibers/TAP	MSP **	36.38%	0.84%	6.48%	2.65%	9.20%	36.93%	0.00%	92.48%	0.00%	0.06%	0.07%	0.14%	0.27%	7.25%	100.00%	179.37
62604	Proc C	Com/Res	Fibers/TAP	MSP **	37.18%	11.15%	18.73%	4.72%	2.00%	22.16%	0.00%	95.94%	0.50%	0.06%	0.07%	0.06%	0.69%	3.36%	100.00%	174.84
62605	Proc C	Com/Res	Fibers/TAP	MSP **	19.47%	9.16%	35.80%	8.59%	10.31%	14.37%	0.00%	97.70%	0.29%	0.29%	0.14%	0.29%	1.00%	1.29%	100.00%	174.59
62606	Proc C	Com/Res	Fibers/TAP	MSP **	37.42%	12.89%	23.96%	5.40%	2.66%	15.28%	0.00%	97.61%	0.00%	0.14%	0.21%	0.07%	0.43%	1.96%	100.00%	178.39
53103	Proc C	Com/Res	Fibers/TAP	OCC	98.89%	0.00%	0.25%	0.00%	0.00%	0.00%	0.00%	99.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.86%	100.00%	203.00
53104	Proc C	Com/Res	Fibers/TAP	OCC	82.08%	0.14%	3.40%	0.45%	3.62%	4.60%	0.00%	94.29%	0.00%	0.14%	0.00%	0.00%	0.14%	5.57%	100.00%	179.40
53109	Proc C	Com/Res	Fibers/TAP	OCC	97.82%	0.00%	0.00%	0.00%	0.16%	1.09%	0.00%	99.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.94%	100.00%	160.25
61907	Proc C	Com/Res	Fibers/TAP	OCC	95.01%	0.00%	0.03%	0.50%	0.00%	4.46%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	151.30
61908	Proc C	Com/Res	Fibers/TAP	OCC	87.83%	0.00%	0.08%	0.00%	0.00%	11.68%	0.00%	99.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	100.00%	156.26
61909	Proc C	Com/Res	Fibers/TAP	OCC	95.72%	0.00%	0.09%	0.09%	0.00%	3.45%	0.00%	99.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.66%	100.00%	152.01
62601	Proc C	Com/Res	Fibers/TAP	OCC	94.06%	0.00%	0.17%	0.00%	0.67%	4.61%	0.00%	99.50%	0.00%	0.00%	0.17%	0.00%	0.17%	0.33%	100.00%	149.38
62602	Proc C	Com/Res	Fibers/TAP	OCC	91.11%	0.16%	5.04%	0.24%	0.08%	3.20%	0.00%	99.83%	0.00%	0.00%	0.08%	0.00%	0.08%	0.08%	100.00%	156.40
62603	Proc C	Com/Res	Fibers/TAP	OCC	87.59%	0.29%	0.50%	1.22%	0.57%	6.02%	0.00%	96.20%	0.00%	0.00%	0.14%	0.07%	0.22%	3.58%	100.00%	174.39
53105	Proc C	Com/Res	Fibers/TAP	ONP #7	0.34%	12.26%	20.44%	62.33%	0.85%	2.38%	0.00%	98.60%	0.03%	0.00%	0.00%	0.17%	0.20%	1.19%	100.00%	146.80
53106	Proc C	Com/Res	Fibers/TAP	ONP #7	0.51%	8.17%	16.09%	68.18%	3.83%	1.92%	0.00%	98.70%	0.00%	0.00%	0.03%	0.13%	0.15%	1.15%	100.00%	195.80
53107	Proc C	Com/Res	Fibers/TAP	ONP #7	0.26%	7.98%	14.78%	72.29%	1.71%	1.32%	0.00%	98.35%	0.00%	0.00%	0.00%	0.73%	0.73%	0.92%	100.00%	189.51
61901	Proc C	Com/Res	Fibers/TAP	ONP #7	0.50%	10.81%	28.46%	57.77%	1.28%	0.85%	0.00%	99.68%	0.00%	0.03%	0.00%	0.07%	0.10%	0.22%	100.00%	175.69
61902	Proc C	Com/Res	Fibers/TAP	ONP #7	0.54%	11.51%	26.77%	57.59%	1.61%	1.35%	0.00%	99.36%	0.00%	0.00%	0.03%	0.13%	0.16%	0.47%	100.00%	185.81
61903	Proc C	Com/Res	Fibers/TAP	ONP #7	0.26%	11.94%	22.56%	60.99%	1.38%	1.97%	0.00%	99.09%	0.07%	0.03%	0.03%	0.13%	0.25%	0.66%	100.00%	190.61
62607	Proc C	Com/Res	Fibers/TAP	ONP #7	0.59%	10.61%	13.24%	71.29%	1.64%	1.57%	0.00%	98.95%	0.20%	0.00%	0.00%	0.39%	0.59%	0.46%	100.00%	190.77
62608	Proc C	Com/Res	Fibers/TAP	ONP #7	0.30%	12.12%	17.85%	63.65%	2.83%	2.46%	0.00%	99.20%	0.00%	0.00%	0.06%	0.30%	0.36%	0.45%	100.00%	168.11
62609	Proc C	Com/Res	Fibers/TAP	ONP #7	0.24%	14.78%	20.55%	58.76%	2.49%	2.17%	0.00%	99.00%	0.03%	0.00%	0.00%	0.08%	0.12%	0.89%	100.00%	155.71

**** Reloaded for additional sorting at another processor.**

Average by Commodity

	OCC	Mags	MSP	ONP	Other Groundwd	Paper-board	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PROHI-BITIVES**	TOTAL	Sample Weight
Residue	3.02%	1.39%	9.39%	6.41%	3.55%	1.65%	0.13%	25.54%	0.04%	0.63%	9.26%	1.30%	11.22%	63.23%	100.00%	162.46
MSP **	38.73%	4.92%	13.76%	4.50%	6.25%	27.02%	0.00%	95.17%	0.11%	0.17%	0.07%	0.14%	0.48%	4.34%	100.00%	170.88
OCC	92.23%	0.07%	1.06%	0.28%	0.57%	4.35%	0.00%	98.55%	0.00%	0.02%	0.04%	0.01%	0.07%	1.38%	100.00%	164.71
ONP #7	0.39%	11.13%	20.08%	63.65%	1.96%	1.78%	0.00%	98.99%	0.04%	0.01%	0.02%	0.24%	0.30%	0.71%	100.00%	177.65

Median by Commodity

Residue	1.36%	0.15%	2.26%	2.79%	0.12%	0.70%	0.00%	7.60%	0.00%	0.40%	0.95%	1.34%	3.32%	61.15%	100.00%	142.26
MSP **	39.54%	1.94%	8.42%	4.32%	6.28%	29.79%	0.00%	95.98%	0.00%	0.14%	0.05%	0.11%	0.42%	3.54%	100.00%	176.62
OCC	94.06%	0.00%	0.17%	0.09%	0.08%	4.46%	0.00%	99.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.66%	100.00%	156.40
ONP #7	0.34%	11.51%	20.44%	62.33%	1.64%	1.92%	0.00%	99.00%	0.00%	0.00%	0.00%	0.13%	0.20%	0.66%	100.00%	185.81

Range by Commodity

Residue																
Low	0.37%	0.00%	0.93%	0.00%	0.00%	0.00%	0.00%	1.87%	0.00%	0.10%	0.00%	0.00%	0.22%	25.73%	100.00%	110.39
High	14.23%	9.64%	36.06%	39.19%	18.83%	5.45%	1.21%	73.28%	0.31%	1.54%	29.63%	2.72%	32.11%	95.64%	100.00%	251.64
MSP																
Low	19.47%	0.42%	4.08%	2.61%	2.00%	14.37%	0.00%	91.71%	0.00%	0.00%	0.00%	0.00%	0.27%	1.29%	100.00%	128.39
High	48.38%	12.89%	35.80%	8.59%	11.06%	36.93%	0.00%	97.70%	0.50%	0.46%	0.21%	0.39%	1.00%	8.01%	100.00%	190.18
OCC																
Low	82.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	94.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	149.38
High	98.89%	0.29%	5.04%	1.22%	3.62%	11.68%	0.00%	100.00%	0.00%	0.14%	0.17%	0.07%	0.22%	5.57%	100.00%	203.00
ONP #7																
Low	0.24%	7.98%	13.24%	57.59%	0.85%	0.85%	0.00%	98.35%	0.00%	0.00%	0.00%	0.07%	0.10%	0.22%	100.00%	146.80
High	0.59%	14.78%	28.46%	72.29%	3.83%	2.46%	0.00%	99.68%	0.20%	0.03%	0.06%	0.73%	0.73%	1.19%	100.00%	195.80

Sampling Results at Processor D

					PAPER									OTHER MATERIALS								
Sample #	Facility Name	Facility's Mix	Facility's Materials	Material Sampled	OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other GroundW	Paperbd	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PRO-HIBITIVES**	TOTAL	Sample Weight
61510	Proc D	Com/Res	Fibers	Residue	0.00%	0.00%	0.00%	2.41%	7.42%	0.00%	0.00%	6.11%	0.00%	15.94%	0.00%	0.44%	0.44%	0.23%	1.10%	82.95%	100.00%	57.26
61511	Proc D	Com/Res	Fibers	Residue	5.24%	0.00%	0.00%	0.00%	4.80%	3.49%	0.23%	9.61%	0.00%	23.37%	1.97%	0.87%	18.77%	1.31%	22.93%	53.70%	100.00%	57.26
62008	Proc D	Com/Res	Fibers	Residue	0.00%	0.00%	0.00%	0.00%	1.62%	5.72%	0.00%	10.59%	0.00%	17.93%	0.00%	0.00%	0.84%	0.00%	0.84%	81.22%	100.00%	15.39
62013	Proc D	Com/Res	Fibers	Residue	2.68%	0.00%	0.00%	0.00%	9.57%	2.13%	0.00%	21.26%	0.00%	35.63%	0.00%	0.55%	34.01%	0.55%	35.12%	29.25%	100.00%	23.52
62411	Proc D	Com/Res	Fibers	Residue	0.00%	0.00%	0.00%	0.00%	7.62%	0.00%	0.00%	7.62%	0.00%	15.24%	0.00%	0.00%	0.23%	5.16%	5.40%	79.36%	100.00%	55.76
62412	Proc D	Com/Res	Fibers	Residue	12.69%	0.00%	0.00%	0.00%	5.58%	0.82%	0.00%	3.17%	0.00%	22.27%	0.00%	0.00%	50.76%	1.59%	52.35%	25.38%	100.00%	15.76
61509	Proc D	Com/Res	Fibers	MSP	4.42%	0.00%	0.00%	27.89%	34.64%	17.20%	4.91%	4.30%	0.00%	93.36%	0.00%	0.00%	0.62%	0.74%	1.36%	5.29%	100.00%	101.77
62001	Proc D	Com/Res	Fibers	MSP	6.40%	0.00%	0.00%	11.46%	38.82%	23.54%	3.72%	9.70%	0.00%	93.64%	0.04%	0.04%	0.41%	0.50%	0.99%	5.37%	100.00%	121.08
62002	Proc D	Com/Res	Fibers	MSP	6.05%	0.00%	0.00%	5.12%	43.40%	18.29%	4.34%	13.80%	0.00%	91.00%	0.00%	0.16%	0.31%	0.31%	0.78%	8.22%	100.00%	80.65
62012	Proc D	Com/Res	Fibers	MSP	2.18%	0.00%	0.00%	12.05%	48.19%	20.72%	5.07%	7.00%	0.00%	95.20%	0.10%	0.10%	0.02%	0.25%	0.46%	4.34%	100.00%	51.88
62407	Proc D	Com/Res	Fibers	MSP	3.50%	0.00%	0.00%	7.84%	46.18%	33.68%	1.91%	5.41%	0.00%	98.51%	0.00%	0.21%	0.11%	0.42%	0.75%	0.75%	100.00%	118.02
61501	Proc D	Com/Res	Fibers	OCC	95.37%	0.00%	0.00%	0.00%	1.06%	0.65%	0.32%	2.27%	0.00%	99.67%	0.00%	0.00%	0.08%	0.00%	0.08%	0.25%	100.00%	154.14
61504	Proc D	Com/Res	Fibers	OCC	91.21%	0.00%	0.00%	0.31%	2.67%	2.12%	0.40%	1.10%	0.00%	97.81%	0.00%	0.55%	0.03%	0.00%	0.58%	1.60%	100.00%	159.24
61505	Proc D	Com/Res	Fibers	OCC	90.57%	0.00%	0.00%	0.00%	4.55%	0.91%	0.99%	1.74%	0.00%	98.76%	0.00%	0.25%	0.33%	0.00%	0.58%	0.66%	100.00%	151.27
62009	Proc D	Com/Res	Fibers	OCC	88.01%	0.00%	0.00%	0.00%	3.78%	2.81%	4.22%	0.00%	0.00%	98.82%	0.00%	0.70%	0.04%	0.00%	0.74%	0.44%	100.00%	142.31
62010	Proc D	Com/Res	Fibers	OCC	81.30%	0.00%	0.00%	0.42%	2.50%	2.50%	0.29%	9.50%	0.00%	96.50%	0.00%	0.00%	0.67%	0.00%	0.67%	2.83%	100.00%	150.06
62011	Proc D	Com/Res	Fibers	OCC	81.49%	0.00%	0.00%	0.06%	1.92%	3.68%	0.48%	11.03%	0.00%	98.65%	0.00%	0.00%	0.08%	0.06%	0.15%	1.20%	100.00%	156.46
62401	Proc D	Com/Res	Fibers	OCC	43.45%	0.00%	0.00%	2.30%	6.23%	9.79%	2.67%	34.41%	0.00%	98.85%	0.03%	0.08%	0.15%	0.23%	0.48%	0.67%	100.00%	168.57
62402	Proc D	Com/Res	Fibers	OCC	38.29%	0.00%	0.00%	1.44%	9.21%	11.38%	3.43%	34.13%	0.00%	97.88%	0.00%	0.36%	0.04%	0.09%	0.49%	1.63%	100.00%	138.43
62410	Proc D	Com/Res	Fibers	OCC	77.91%	0.00%	0.00%	0.34%	3.17%	1.71%	1.71%	13.36%	0.00%	98.20%	0.00%	0.00%	0.09%	0.00%	0.09%	1.71%	100.00%	146.01
61502	Proc D	Com/Res	Fibers	ONP #6	4.48%	0.00%	0.00%	18.97%	30.50%	30.80%	5.01%	3.64%	0.00%	93.39%	0.00%	0.69%	0.08%	0.15%	0.92%	5.69%	100.00%	164.77
61503	Proc D	Com/Res	Fibers	ONP #6	2.85%	0.00%	0.00%	17.13%	32.35%	35.52%	2.70%	6.19%	0.00%	96.75%	0.00%	1.12%	0.06%	0.63%	1.81%	1.43%	100.00%	78.82
62003	Proc D	Com/Res	Fibers	ONP #6	1.74%	0.00%	0.00%	9.97%	31.64%	50.78%	2.14%	3.25%	0.00%	99.52%	0.00%	0.08%	0.00%	0.16%	0.24%	0.24%	100.00%	158.02
62004	Proc D	Com/Res	Fibers	ONP #6	0.68%	0.00%	0.00%	7.78%	39.76%	42.98%	4.74%	3.72%	0.00%	99.65%	0.00%	0.09%	0.09%	0.00%	0.18%	0.17%	100.00%	147.76
62005	Proc D	Com/Res	Fibers	ONP #6	3.97%	0.00%	0.00%	10.99%	25.77%	39.29%	13.70%	5.05%	0.00%	98.77%	0.00%	0.24%	0.18%	0.00%	0.42%	0.81%	100.00%	138.71
62403	Proc D	Com/Res	Fibers	ONP #6	0.00%	0.00%	0.00%	9.48%	7.90%	73.92%	3.40%	4.42%	0.00%	99.12%	0.00%	0.16%	0.08%	0.08%	0.32%	0.56%	100.00%	158.27
62404	Proc D	Com/Res	Fibers	ONP #6	4.70%	0.00%	0.00%	6.88%	21.65%	44.30%	9.40%	2.69%	0.00%	89.62%	0.00%	0.09%	0.09%	0.84%	1.01%	9.37%	100.00%	148.97
61506	Proc D	Com/Res	Fibers	W.Ledger	5.10%	84.95%	3.52%	0.18%	1.06%	2.46%	0.44%	1.58%	0.00%	99.29%	0.00%	0.18%	0.09%	0.00%	0.27%	0.44%	100.00%	142.14
61507	Proc D	Com/Res	Fibers	W.Ledger	2.53%	87.40%	1.27%	0.46%	1.27%	3.89%	1.18%	0.82%	0.00%	98.82%	0.00%	0.54%	0.18%	0.00%	0.72%	0.46%	100.00%	138.15
61508	Proc D	Com/Res	Fibers	W.Ledger	1.71%	87.13%	2.29%	0.86%	0.86%	2.00%	1.14%	0.57%	0.00%	96.56%	0.00%	0.57%	0.15%	0.15%	0.87%	2.57%	100.00%	87.51
62006	Proc D	Com/Res	Fibers	W.Ledger	7.38%	85.37%	1.20%	0.55%	0.74%	2.58%	0.65%	0.46%	0.00%	98.94%	0.01%	0.10%	0.00%	0.04%	0.14%	0.92%	100.00%	135.58
62007	Proc D	Com/Res	Fibers	W.Ledger	0.49%	91.34%	1.47%	0.65%	1.47%	3.52%	0.25%	0.33%	0.00%	99.54%	0.00%	0.09%	0.13%	0.00%	0.22%	0.25%	100.00%	152.72
62405	Proc D	Com/Res	Fibers	W.Ledger	0.56%	88.54%	1.25%	0.21%	2.23%	4.94%	0.91%	0.63%	0.00%	99.27%	0.00%	0.07%	0.03%	0.00%	0.10%	0.63%	100.00%	179.58
62406	Proc D	Com/Res	Fibers	W.Ledger	0.08%	97.02%	0.79%	0.32%	0.48%	1.03%	0.08%	0.08%	0.00%	99.89%	0.00%	0.00%	0.03%	0.00%	0.03%	0.08%	100.00%	157.70
62408	Proc D	Com/Res	Fibers	W.Ledger	0.50%	96.27%	0.33%	0.09%	0.33%	1.57%	0.42%	0.42%	0.00%	99.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.09%	100.00%	151.40
62409	Proc D	Com/Res	Fibers	W.Ledger	2.55%	91.05%	0.40%	0.08%	0.24%	1.28%	2.23%	1.52%	0.00%	99.36%	0.00%	0.16%	0.00%	0.08%	0.24%	0.40%	100.00%	156.78

Average by Commodity

	OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other Groundwd	Paper-board	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PROHI-BITIVES**	TOTAL	Sample Weight
Residue	3.43%	0.00%	0.00%	0.40%	6.10%	2.03%	0.04%	9.73%	0.00%	21.73%	0.33%	0.31%	17.51%	1.47%	19.62%	58.64%	100.00%	37.49
Mixed Scrap Paper	4.51%	0.00%	0.00%	12.87%	42.24%	22.68%	3.99%	8.04%	0.00%	94.34%	0.03%	0.10%	0.29%	0.44%	0.87%	4.79%	100.00%	94.68
OCC	76.40%	0.00%	0.00%	0.54%	3.90%	3.95%	1.61%	11.95%	0.00%	98.35%	0.00%	0.22%	0.17%	0.04%	0.43%	1.22%	100.00%	151.83
ONP #6	2.63%	0.00%	0.00%	11.60%	27.08%	45.37%	5.87%	4.14%	0.00%	96.69%	0.00%	0.35%	0.08%	0.27%	0.70%	2.61%	100.00%	142.19
White Ledger	2.32%	89.90%	1.39%	0.38%	0.96%	2.59%	0.81%	0.71%	0.00%	99.06%	0.00%	0.19%	0.07%	0.03%	0.29%	0.65%	100.00%	144.62

Median by Commodity

Residue	1.34%	0.00%	0.00%	0.00%	6.50%	1.48%	0.00%	8.61%	0.00%	20.10%	0.00%	0.22%	9.81%	0.93%	14.16%	66.53%	100.00%	39.64
MSP	4.42%	0.00%	0.00%	11.46%	43.40%	20.72%	4.34%	7.00%	0.00%	93.64%	0.00%	0.10%	0.31%	0.42%	0.78%	5.29%	100.00%	101.77
OCC	81.49%	0.00%	0.00%	0.31%	3.17%	2.50%	0.99%	9.50%	0.00%	98.65%	0.00%	0.08%	0.08%	0.00%	0.49%	1.20%	100.00%	151.27
ONP #6	2.85%	0.00%	0.00%	9.97%	30.50%	42.98%	4.74%	3.72%	0.00%	98.77%	0.00%	0.16%	0.08%	0.15%	0.42%	0.81%	100.00%	148.97
White Ledger	1.71%	88.54%	1.25%	0.32%	0.86%	2.46%	0.65%	0.57%	0.00%	99.29%	0.00%	0.10%	0.03%	0.00%	0.22%	0.44%	100.00%	151.40

Range by Commodity

Residue																		
Low	0.00%	0.00%	0.00%	0.00%	1.62%	0.00%	0.00%	3.17%	0.00%	15.24%	0.00%	0.00%	0.23%	0.00%	0.84%	25.38%	100.00%	15.39
High	12.69%	0.00%	0.00%	2.41%	9.57%	5.72%	0.23%	21.26%	0.00%	35.63%	1.97%	0.87%	50.76%	5.16%	52.35%	82.95%	100.00%	57.26
MSP																		
Low	2.18%	0.00%	0.00%	5.12%	34.64%	17.20%	1.91%	4.30%	0.00%	91.00%	0.00%	0.00%	0.02%	0.25%	0.46%	0.75%	100.00%	51.88
High	6.40%	0.00%	0.00%	27.89%	48.19%	33.68%	5.07%	13.80%	0.00%	98.51%	0.10%	0.21%	0.62%	0.74%	1.36%	8.22%	100.00%	121.08
OCC																		
Low	38.29%	0.00%	0.00%	0.00%	1.06%	0.65%	0.29%	0.00%	0.00%	96.50%	0.00%	0.00%	0.03%	0.00%	0.08%	0.25%	100.00%	138.43
High	95.37%	0.00%	0.00%	2.30%	9.21%	11.38%	4.22%	34.41%	0.00%	99.67%	0.03%	0.70%	0.67%	0.23%	0.74%	2.83%	100.00%	168.57
ONP #6																		
Low	0.00%	0.00%	0.00%	6.88%	7.90%	30.80%	2.14%	2.69%	0.00%	89.62%	0.00%	0.08%	0.00%	0.00%	0.18%	0.17%	100.00%	78.82
High	4.70%	0.00%	0.00%	18.97%	39.76%	73.92%	13.70%	6.19%	0.00%	99.65%	0.00%	1.12%	0.18%	0.84%	1.81%	9.37%	100.00%	164.77
White Ledger																		
Low	0.08%	84.95%	0.33%	0.08%	0.24%	1.03%	0.08%	0.08%	0.00%	96.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.08%	100.00%	87.51
High	7.38%	97.02%	3.52%	0.86%	2.23%	4.94%	2.23%	1.58%	0.00%	99.91%	0.01%	0.57%	0.18%	0.15%	0.87%	2.57%	100.00%	179.58

Sampling Results at Processor E

					PAPER									OTHER MATERIALS								
Sample #	Facility Name	Material Source	Material Mixture	Product Sampled	OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other GroundW	Paperbd	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PRO-HIBITIVES**	TOTAL	Sample Weight
60509	Proc E	Com	Fibers	Residue	1.63%	0.00%	0.00%	0.72%	10.47%	1.27%	0.00%	0.55%	0.00%	14.64%	2.71%	2.89%	23.10%	6.50%	35.20%	50.17%	100.00%	69.27
60502	Proc E	**Comm**	Fibers	MSP	4.40%	0.00%	0.00%	1.88%	22.31%	56.50%	6.19%	5.54%	0.00%	96.81%	0.00%	0.16%	0.08%	0.00%	0.25%	2.94%	100.00%	153.53
60503	Proc E	**Comm**	Fibers	MSP	2.85%	0.00%	0.00%	2.93%	17.73%	47.66%	16.31%	5.22%	0.00%	92.70%	0.00%	0.00%	0.08%	0.08%	0.16%	7.13%	100.00%	157.90
60508	Proc E	**Comm**	Fibers	MSP	1.36%	0.00%	0.00%	1.15%	19.14%	68.25%	2.91%	1.87%	0.00%	94.69%	0.00%	0.00%	0.11%	0.00%	0.11%	5.20%	100.00%	120.14
60510	Proc E	**Comm**	Fibers	OCC	90.57%	0.00%	0.00%	0.22%	3.03%	0.87%	0.11%	4.33%	0.00%	99.13%	0.00%	0.00%	0.22%	0.00%	0.22%	0.65%	100.00%	115.38
60511	Proc E	**Comm**	Fibers	OCC	90.26%	0.00%	0.00%	0.00%	2.54%	0.44%	0.09%	3.15%	0.00%	96.49%	0.00%	0.00%	0.18%	0.00%	0.18%	3.33%	100.00%	142.64
60512	Proc E	**Comm**	Fibers	OCC	87.29%	0.00%	0.00%	0.20%	7.79%	0.11%	0.00%	4.30%	0.00%	99.69%	0.00%	0.00%	0.11%	0.00%	0.11%	0.20%	100.00%	122.01
60504	Proc E	**Comm**	Fibers	OP #1	0.18%	0.00%	0.00%	11.96%	70.38%	1.75%	0.28%	13.98%	0.00%	98.54%	0.00%	0.00%	0.04%	0.04%	0.07%	1.38%	100.00%	135.87
60505	Proc E	**Comm**	Fibers	OP #1	0.55%	0.00%	0.00%	9.89%	78.02%	1.19%	0.46%	8.97%	0.00%	99.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.92%	100.00%	136.51
60507	Proc E	**Comm**	Fibers	OP #1	0.19%	0.00%	0.00%	5.34%	83.61%	1.87%	0.66%	7.49%	0.00%	99.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.85%	100.00%	133.52
60501	Proc E	**Comm**	Fibers	W.Ledger	0.04%	92.11%	0.47%	0.47%	5.53%	0.19%	0.04%	0.00%	0.00%	98.84%	0.00%	0.00%	0.04%	0.00%	0.04%	1.12%	100.00%	133.54
60506	Proc E	**Comm**	Fibers	W.Ledger	0.00%	98.78%	0.09%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	99.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	100.00%	143.76

Average by Commodity

	OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other Groundwd	Paper-board	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PROHI-BITIVES**	TOTAL	Sample Weight
Residue	1.63%	0.00%	0.00%	0.72%	10.47%	1.27%	0.00%	0.55%	0.00%	14.64%	2.71%	2.89%	23.10%	6.50%	35.20%	50.17%	100.00%	
MSP	2.87%	0.00%	0.00%	1.99%	19.73%	57.47%	8.47%	4.21%	0.00%	94.74%	0.00%	0.05%	0.09%	0.03%	0.17%	5.09%	100.00%	
OCC	89.37%	0.00%	0.00%	0.14%	4.45%	0.47%	0.07%	3.93%	0.00%	98.44%	0.00%	0.00%	0.17%	0.00%	0.17%	1.39%	100.00%	
OP#1	0.31%	0.00%	0.00%	9.06%	77.34%	1.61%	0.47%	10.15%	0.00%	98.93%	0.00%	0.00%	0.01%	0.01%	0.02%	1.05%	100.00%	
White Ledger	0.02%	95.44%	0.28%	0.24%	2.98%	0.09%	0.02%	0.00%	0.00%	99.07%	0.00%	0.00%	0.02%	0.00%	0.02%	0.91%	100.00%	

Median by Commodity

Residue	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MSP	2.85%	0.00%	0.00%	1.88%	19.14%	56.50%	6.19%	5.22%	0.00%	94.69%	0.00%	0.00%	0.08%	0.00%	0.16%	5.20%	100.00%	153.53
OCC	90.26%	0.00%	0.00%	0.20%	3.03%	0.44%	0.09%	4.30%	0.00%	99.13%	0.00%	0.00%	0.18%	0.00%	0.18%	0.65%	100.00%	122.01
OP #1	0.19%	0.00%	0.00%	9.89%	78.02%	1.75%	0.46%	8.97%	0.00%	99.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.92%	100.00%	135.87
White Ledger	0.02%	95.44%	0.28%	0.24%	2.98%	0.09%	0.02%	0.00%	0.00%	99.07%	0.00%	0.00%	0.02%	0.00%	0.02%	0.91%	100.00%	138.65

Range by Commodity

Residue																		
Low	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
High	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MSP																		
Low	1.36%	0.00%	0.00%	1.15%	17.73%	47.66%	2.91%	1.87%	0.00%	92.70%	0.00%	0.00%	0.08%	0.00%	0.11%	2.94%	100.00%	120.14
High	4.40%	0.00%	0.00%	2.93%	22.31%	68.25%	16.31%	5.54%	0.00%	96.81%	0.00%	0.16%	0.11%	0.08%	0.25%	7.13%	100.00%	157.90
OCC																		
Low	87.29%	0.00%	0.00%	0.00%	2.54%	0.11%	0.00%	3.15%	0.00%	96.49%	0.00%	0.00%	0.11%	0.00%	0.11%	0.20%	100.00%	115.38
High	90.57%	0.00%	0.00%	0.22%	7.79%	0.87%	0.11%	4.33%	0.00%	99.69%	0.00%	0.00%	0.22%	0.00%	0.22%	3.33%	100.00%	142.64
OP #1																		
Low	0.18%	0.00%	0.00%	5.34%	70.38%	1.19%	0.28%	7.49%	0.00%	98.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.85%	100.00%	133.52
High	0.55%	0.00%	0.00%	11.96%	83.61%	1.87%	0.66%	13.98%	0.00%	99.15%	0.00%	0.00%	0.04%	0.04%	0.07%	1.38%	100.00%	136.51
White Ledger																		
Low	0.00%	92.11%	0.09%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	98.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	100.00%	133.54
High	0.04%	98.78%	0.47%	0.47%	5.53%	0.19%	0.04%	0.00%	0.00%	99.30%	0.00%	0.00%	0.04%	0.00%	0.04%	1.12%	100.00%	143.76

Sampling Results at Processor F

					PAPER								OTHER MATERIALS							
Sample #	Facility Name	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other GroundW	Paperbd	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PRO-HIBITIVE**	**TOTAL**	Sample Weight
61207	Proc F	Com/Res	1-Stream	Residue	2.79%	0.70%	4.38%	0.60%	0.00%	8.36%	0.00%	16.82%	0.00%	8.76%	4.38%	27.66%	40.79%	42.39%	100.00%	125.63
61210	Proc F	Com/Res	1-Stream	Residue	2.59%	0.60%	33.19%	5.84%	3.78%	4.97%	0.00%	50.97%	0.76%	3.78%	4.76%	23.35%	32.65%	16.38%	100.00%	231.26
61212	Proc F	Com/Res	1-Stream	Residue	5.48%	2.17%	38.94%	0.48%	2.88%	2.26%	0.00%	52.21%	0.58%	3.37%	0.00%	21.44%	25.38%	22.40%	100.00%	260.01
61710	Proc F	Com/Res	1-Stream	Residue	8.55%	12.07%	4.27%	2.03%	3.85%	3.20%	0.00%	33.98%	0.43%	1.28%	4.27%	23.18%	29.17%	36.86%	100.00%	117.02
61711	Proc F	Com/Res	1-Stream	Residue	7.93%	0.38%	1.53%	0.38%	4.20%	4.58%	0.00%	19.01%	0.00%	3.25%	9.55%	22.73%	35.53%	45.46%	100.00%	130.88
61712	Proc F	Com/Res	1-Stream	Residue	5.88%	0.08%	3.40%	2.40%	0.15%	4.10%	0.00%	16.02%	0.24%	2.17%	30.78%	24.05%	57.23%	26.76%	100.00%	161.65
62107	Proc F	Com/Res	1-Stream	Residue	6.77%	0.00%	6.90%	1.51%	2.64%	1.76%	0.00%	19.58%	1.89%	3.51%	15.56%	57.71%	78.66%	1.76%	100.00%	99.64
62108	Proc F	Com/Res	1-Stream	Residue	0.91%	0.00%	3.54%	0.23%	0.12%	1.03%	0.00%	5.83%	0.91%	3.20%	9.13%	26.25%	39.49%	54.67%	100.00%	109.52
62109	Proc F	Com/Res	1-Stream	Residue	1.69%	0.17%	1.61%	0.51%	2.70%	0.68%	0.00%	7.36%	0.17%	1.52%	10.31%	60.18%	72.19%	20.46%	100.00%	147.88
61203	Proc F	Com/Res	1-Stream	OCC	75.18%	0.79%	7.10%	5.17%	0.79%	8.94%	0.00%	97.97%	0.00%	0.27%	0.00%	0.09%	0.36%	1.67%	100.00%	142.66
61204	Proc F	Com/Res	1-Stream	OCC	48.71%	18.01%	5.79%	5.51%	1.10%	15.81%	0.00%	94.93%	0.10%	0.46%	0.18%	0.65%	1.39%	3.68%	100.00%	136.02
61205	Proc F	Com/Res	1-Stream	OCC	62.25%	4.60%	6.11%	4.31%	2.40%	15.81%	0.00%	95.48%	0.00%	0.50%	0.00%	0.10%	0.61%	3.91%	100.00%	124.90
61707	Proc F	Com/Res	1-Stream	OCC	69.98%	1.73%	4.14%	1.93%	0.76%	20.43%	0.00%	98.97%	0.03%	0.28%	0.03%	0.21%	0.54%	0.49%	100.00%	181.12
61708	Proc F	Com/Res	1-Stream	OCC	70.81%	2.62%	8.00%	8.20%	0.33%	6.82%	0.00%	96.78%	0.13%	0.20%	0.26%	0.26%	0.86%	2.36%	100.00%	190.64
61709	Proc F	Com/Res	1-Stream	OCC	82.84%	0.28%	3.06%	1.39%	0.93%	10.47%	0.00%	98.98%	0.00%	0.00%	0.10%	0.00%	0.10%	0.93%	100.00%	134.90
62110	Proc F	Com/Res	1-Stream	OCC	81.47%	1.17%	1.37%	2.25%	1.76%	9.38%	0.00%	97.40%	0.04%	0.08%	0.00%	0.04%	0.16%	2.45%	100.00%	127.96
62111	Proc F	Com/Res	1-Stream	OCC	78.22%	0.60%	2.39%	1.88%	0.34%	14.69%	0.00%	98.11%	0.17%	0.85%	0.00%	0.09%	1.11%	0.77%	100.00%	146.39
62112	Proc F	Com/Res	1-Stream	OCC	83.20%	0.29%	1.84%	1.77%	2.06%	7.07%	0.00%	96.24%	0.00%	0.08%	0.00%	0.08%	0.15%	3.61%	100.00%	169.77
61201	Proc F	Com/Res	1-Stream	ONP #6	3.03%	12.92%	27.75%	42.10%	1.28%	5.42%	0.00%	92.50%	0.08%	3.19%	0.24%	0.64%	4.15%	3.35%	100.00%	156.76
61202	Proc F	Com/Res	1-Stream	ONP #6	3.32%	21.09%	30.01%	28.91%	5.21%	5.61%	0.00%	94.16%	0.16%	2.21%	0.32%	1.11%	3.79%	2.05%	100.00%	158.26
61206	Proc F	Com/Res	1-Stream	ONP #6	2.90%	18.86%	34.42%	30.67%	2.66%	6.65%	0.00%	96.16%	0.31%	0.63%	0.24%	0.31%	1.49%	2.35%	100.00%	159.77
61701	Proc F	Com/Res	1-Stream	ONP #6	2.32%	14.15%	20.61%	41.79%	7.11%	7.40%	0.00%	93.39%	1.09%	0.87%	0.15%	2.40%	4.50%	2.11%	100.00%	172.27
61702	Proc F	Com/Res	1-Stream	ONP #6	2.39%	18.52%	19.72%	43.22%	1.99%	5.38%	0.00%	91.23%	0.00%	1.30%	0.20%	2.10%	3.59%	5.18%	100.00%	125.51
61703	Proc F	Com/Res	1-Stream	ONP #6	2.47%	25.15%	18.37%	39.20%	4.93%	6.17%	0.00%	96.29%	0.35%	0.41%	0.07%	0.21%	1.04%	2.68%	100.00%	182.40
62101	Proc F	Com/Res	1-Stream	ONP #6	2.43%	11.43%	39.52%	23.63%	6.20%	10.65%	0.00%	93.86%	0.04%	2.13%	0.19%	1.26%	3.63%	2.52%	100.00%	129.06
62102	Proc F	Com/Res	1-Stream	ONP #6	3.71%	14.06%	25.19%	33.59%	3.71%	9.37%	0.00%	89.64%	0.10%	4.30%	0.10%	3.32%	7.82%	2.54%	100.00%	128.01
62103	Proc F	Com/Res	1-Stream	ONP #6	8.03%	16.06%	14.75%	36.88%	6.88%	9.67%	0.00%	92.29%	0.00%	3.77%	0.25%	1.07%	5.09%	2.62%	100.00%	152.51
61208	Proc F	Com/Res	1-Stream	Pprbd/OCC	55.66%	0.46%	0.54%	0.15%	2.59%	36.45%	0.00%	95.85%	0.03%	0.08%	0.08%	0.00%	0.19%	3.96%	100.00%	163.94
61209	Proc F	Com/Res	1-Stream	Pprbd/OCC	72.10%	0.60%	4.33%	1.86%	0.87%	19.11%	0.00%	98.88%	0.00%	0.05%	0.07%	0.07%	0.19%	0.93%	100.00%	187.76
61211	Proc F	Com/Res	1-Stream	Pprbd/OCC	62.98%	0.09%	0.75%	0.33%	1.40%	33.30%	0.00%	98.85%	0.00%	0.00%	0.00%	0.00%	0.00%	1.15%	100.00%	151.64
61704	Proc F	Com/Res	1-Stream	Pprbd/OCC	68.86%	0.30%	0.69%	0.78%	0.69%	26.53%	0.00%	97.85%	0.59%	0.20%	0.20%	0.10%	1.08%	1.08%	100.00%	128.15
61705	Proc F	Com/Res	1-Stream	Pprbd/OCC	68.09%	0.43%	1.54%	1.80%	0.68%	23.55%	0.00%	96.08%	0.03%	0.26%	0.12%	0.34%	0.76%	3.16%	100.00%	146.50
61706	Proc F	Com/Res	1-Stream	Pprbd/OCC	62.26%	0.30%	2.36%	1.55%	0.96%	28.62%	0.00%	96.05%	0.52%	0.03%	0.08%	0.30%	0.92%	3.03%	100.00%	169.45
62104	Proc F	Com/Res	1-Stream	Pprbd/OCC	79.07%	0.00%	0.27%	0.54%	0.96%	18.20%	0.00%	99.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.96%	100.00%	92.01
62105	Proc F	Com/Res	1-Stream	Pprbd/OCC	72.57%	1.18%	0.96%	0.15%	0.29%	20.86%	0.00%	96.00%	0.03%	0.00%	0.08%	0.08%	0.18%	3.82%	100.00%	170.19
62106	Proc F	Com/Res	1-Stream	Pprbd/OCC	81.69%	0.08%	0.08%	0.31%	0.15%	17.50%	0.00%	99.81%	0.00%	0.08%	0.00%	0.08%	0.16%	0.03%	100.00%	162.82

Average by Commodity

	OCC	Mags	MSP	ONP	Other Groundwd	Paper-board	Other	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PROHI-BITIVES**	TOTAL	Sample Weight
Residue	4.73%	1.80%	10.86%	1.55%	2.26%	3.44%	0.00%	24.64%	0.55%	3.43%	9.86%	31.84%	45.68%	29.68%	100.00%	153.72
OCC	72.52%	3.35%	4.42%	3.60%	1.16%	12.16%	0.00%	97.21%	0.05%	0.30%	0.06%	0.17%	0.59%	2.21%	100.00%	150.48
ONP #6	3.40%	16.92%	25.59%	35.56%	4.44%	7.37%	0.00%	93.28%	0.24%	2.09%	0.20%	1.38%	3.90%	2.82%	100.00%	151.62
Paperboard/OCC mix	69.25%	0.38%	1.28%	0.83%	0.96%	24.90%	0.00%	97.60%	0.13%	0.08%	0.07%	0.11%	0.39%	2.01%	100.00%	152.50

Median by Commodity

Residue	5.48%	0.38%	4.27%	0.60%	2.70%	3.20%	0.00%	19.01%	0.43%	3.25%	9.13%	24.05%	39.49%	26.76%	100.00%	130.88
OCC	75.18%	1.17%	4.14%	2.25%	0.93%	10.47%	0.00%	97.40%	0.03%	0.27%	0.00%	0.09%	0.54%	2.36%	100.00%	142.66
ONP#6	2.90%	16.06%	25.19%	36.88%	4.93%	6.65%	0.00%	93.39%	0.10%	2.13%	0.20%	1.11%	3.79%	2.54%	100.00%	156.76
Paperbrd/OCC mix	68.86%	0.30%	0.75%	0.54%	0.87%	23.55%	0.00%	97.85%	0.03%	0.05%	0.08%	0.08%	0.19%	1.15%	100.00%	162.82

Range by Commodity

Residue																
Low	0.91%	0.00%	1.53%	0.23%	0.00%	0.68%	0.00%	5.83%	0.00%	1.28%	0.00%	21.44%	25.38%	1.76%	100.00%	99.64
High	8.55%	12.07%	38.94%	5.84%	4.20%	8.36%	0.00%	52.21%	1.89%	8.76%	30.78%	60.18%	78.66%	54.67%	100.00%	260.01
OCC																
Low	48.71%	0.28%	1.37%	1.39%	0.33%	6.82%	0.00%	94.93%	0.00%	0.00%	0.00%	0.00%	0.10%	0.49%	100.00%	124.90
High	83.20%	18.01%	8.00%	8.20%	2.40%	20.43%	0.00%	98.98%	0.17%	0.85%	0.26%	0.65%	1.39%	3.91%	100.00%	190.64
ONP#6																
Low	2.32%	11.43%	14.75%	23.63%	1.28%	5.38%	0.00%	89.64%	0.00%	0.41%	0.07%	0.21%	1.04%	2.05%	100.00%	125.51
High	8.03%	25.15%	39.52%	43.22%	7.11%	10.65%	0.00%	96.29%	1.09%	4.30%	0.32%	3.32%	7.82%	5.18%	100.00%	182.40
Paperbrd/OCC mix																
Low	55.66%	0.00%	0.08%	0.15%	0.15%	17.50%	0.00%	95.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	100.00%	92.01
High	81.69%	1.18%	4.33%	1.86%	2.59%	36.45%	0.00%	99.81%	0.59%	0.26%	0.20%	0.34%	1.08%	3.96%	100.00%	187.76

Sampling Results at Processor G

					PAPER							OTHER MATERIALS							
Sample #	Facility Name	Material Source	Material Mixture	Product Sampled	OCC	Mags	MSP	ONP	Other GroundW	Paperbd	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PRO-HIBITIVE**	TOTAL	Sample Weight
60704	Proc G	Com	Fibers	Residue	6.98%	0.00%	7.32%	0.23%	0.00%	1.13%	15.66%	9.13%	4.95%	14.86%	2.03%	30.97%	53.37%	100.00%	111.01
60705	Proc G	Com	Fibers	Residue	7.02%	0.00%	0.84%	0.31%	0.00%	2.06%	10.24%	5.04%	4.89%	15.57%	16.42%	41.91%	47.85%	100.00%	163.74
61009	Proc G	Com	Fibers	Residue	2.48%	0.31%	1.86%	0.41%	0.21%	2.79%	8.07%	6.20%	7.23%	19.63%	1.45%	34.50%	57.43%	100.00%	121.01
61010	Proc G	Com	Fibers	Residue	4.77%	0.00%	1.35%	2.70%	0.00%	0.09%	8.92%	3.06%	4.32%	6.48%	13.86%	27.72%	63.36%	100.00%	138.89
61011	Proc G	Com	Fibers	Residue	1.43%	1.32%	6.86%	0.11%	0.05%	1.83%	11.59%	4.17%	3.20%	8.34%	12.00%	27.72%	60.69%	100.00%	218.74
62509	Proc G	Com	Fibers	Residue	0.18%	0.54%	1.06%	1.42%	0.71%	2.31%	6.23%	1.42%	3.02%	57.08%	1.06%	62.58%	31.20%	100.00%	70.52
53001	Proc G	Com	Fibers	MSP **	9.35%	0.00%	45.11%	34.30%	0.00%	6.24%	94.99%	0.11%	0.32%	0.00%	0.11%	0.53%	4.47%	100.00%	120.27
53002	Proc G	Com	Fibers	MSP **	12.21%	0.00%	47.58%	20.22%	2.02%	7.46%	89.49%	0.08%	0.00%	0.39%	0.78%	1.25%	9.26%	100.00%	160.77
53003	Proc G	Com	Fibers	MSP **	15.13%	9.09%	33.13%	28.94%	1.55%	5.02%	92.88%	0.66%	0.24%	0.18%	0.18%	1.26%	5.86%	100.00%	209.02
53007	Proc G	Com	Fibers	MSP **	13.05%	5.02%	36.78%	28.34%	2.87%	6.29%	92.35%	0.32%	0.08%	0.00%	0.24%	0.64%	7.01%	100.00%	157.03
61006	Proc G	Com	Fibers	MSP **	6.69%	8.96%	56.38%	12.42%	5.73%	5.38%	95.58%	0.00%	0.00%	0.12%	0.00%	0.12%	4.30%	100.00%	104.64
61007	Proc G	Com	Fibers	MSP **	5.38%	14.61%	58.60%	10.13%	2.69%	4.30%	95.70%	0.00%	0.18%	0.18%	0.18%	0.54%	3.76%	100.00%	139.51
61008	Proc G	Com	Fibers	MSP **	4.68%	13.21%	58.13%	11.79%	2.85%	5.89%	96.55%	0.00%	0.08%	0.11%	0.31%	0.50%	2.95%	100.00%	122.99
61012	Proc G	Com	Fibers	MSP **	5.78%	8.80%	50.89%	15.13%	2.34%	5.78%	88.71%	0.42%	0.83%	0.00%	0.28%	1.52%	9.77%	100.00%	90.89
62507	Proc G	Com	Fibers	MSP **	3.67%	12.48%	64.10%	11.91%	3.35%	2.04%	97.55%	0.74%	0.00%	0.16%	0.00%	0.90%	1.55%	100.00%	153.28
62508	Proc G	Com	Fibers	MSP **	6.47%	6.96%	59.69%	19.90%	1.25%	1.99%	96.25%	0.01%	0.09%	0.09%	0.17%	0.34%	3.40%	100.00%	150.78
62510	Proc G	Com	Fibers	MSP **	2.93%	13.74%	42.23%	17.30%	4.97%	5.85%	87.02%	0.00%	0.25%	0.25%	0.76%	1.27%	11.70%	100.00%	98.26
62511	Proc G	Com	Fibers	MSP **	4.56%	8.31%	55.39%	22.95%	1.00%	3.96%	96.15%	0.08%	0.00%	0.21%	0.00%	0.28%	3.56%	100.00%	63.19
60701	Proc G	Com	Fibers	OCC	86.00%	0.00%	0.27%	0.07%	0.00%	10.82%	97.16%	0.00%	0.00%	0.00%	0.00%	0.00%	2.84%	100.00%	184.88
60702	Proc G	Com	Fibers	OCC	86.68%	0.09%	1.03%	0.61%	0.26%	7.58%	96.26%	0.00%	0.00%	0.00%	0.78%	0.78%	2.96%	100.00%	145.07
60703	Proc G	Com	Fibers	OCC	86.10%	0.00%	0.41%	0.27%	0.27%	4.07%	91.12%	0.00%	0.00%	0.00%	1.02%	1.02%	7.86%	100.00%	184.38
61001	Proc G	Com	Fibers	OCC	77.98%	0.18%	1.28%	2.74%	0.37%	15.44%	97.98%	0.00%	0.00%	0.09%	0.00%	0.09%	1.92%	100.00%	136.89
61002	Proc G	Com	Fibers	OCC	96.47%	0.00%	0.58%	0.22%	0.08%	0.58%	97.92%	0.00%	0.00%	0.06%	0.00%	0.06%	2.02%	100.00%	173.11
61003	Proc G	Com	Fibers	OCC	87.21%	0.67%	0.82%	0.30%	0.97%	2.90%	92.86%	0.00%	0.00%	0.23%	0.00%	0.23%	6.91%	100.00%	168.28
62505	Proc G	Com	Fibers	OCC	94.13%	0.00%	0.57%	0.16%	0.90%	3.50%	99.27%	0.00%	0.00%	0.16%	0.00%	0.16%	0.57%	100.00%	153.77
62506	Proc G	Com	Fibers	OCC	93.71%	0.00%	0.66%	0.56%	0.37%	3.19%	98.49%	0.00%	0.19%	0.01%	0.00%	0.19%	1.31%	100.00%	133.39
53004	Proc G	Com	Fibers	ONP #6	0.08%	0.15%	1.04%	98.50%	0.00%	0.08%	99.85%	0.08%	0.00%	0.00%	0.00%	0.08%	0.08%	100.00%	168.02
53005	Proc G	Com	Fibers	ONP #6	0.00%	0.40%	1.48%	97.17%	0.27%	0.13%	99.46%	0.07%	0.00%	0.07%	0.27%	0.41%	0.13%	100.00%	185.76
53006	Proc G	Com	Fibers	ONP #6	0.00%	0.47%	1.57%	97.56%	0.00%	0.08%	99.68%	0.08%	0.00%	0.08%	0.00%	0.16%	0.16%	100.00%	159.64
60706	Proc G	Com	Fibers	ONP #6	0.07%	0.00%	0.53%	83.39%	0.34%	0.27%	84.60%	0.47%	0.27%	0.03%	0.60%	1.37%	14.03%	100.00%	187.07
61004	Proc G	Com	Fibers	ONP #6	0.00%	0.00%	2.09%	97.38%	0.00%	0.46%	99.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	100.00%	191.26
61005	Proc G	Com	Fibers	ONP #6	0.28%	1.42%	0.93%	96.01%	0.00%	0.22%	98.86%	0.00%	0.00%	0.00%	0.00%	0.00%	1.14%	100.00%	175.76
62501	Proc G	Com	Fibers	ONP #6	0.09%	0.35%	2.34%	95.60%	0.03%	0.44%	98.84%	0.09%	0.00%	0.03%	0.00%	0.12%	1.04%	100.00%	144.62
62502	Proc G	Com	Fibers	ONP #6	0.62%	0.53%	1.49%	93.12%	0.27%	0.62%	96.63%	0.04%	0.35%	0.35%	0.27%	1.00%	2.37%	100.00%	142.83
62503	Proc G	Com	Fibers	ONP #6	0.39%	0.46%	0.61%	97.81%	0.00%	0.23%	99.51%	0.00%	0.00%	0.03%	0.00%	0.03%	0.46%	100.00%	162.81
62504	Proc G	Com	Fibers	ONP #6	0.24%	0.47%	0.31%	98.20%	0.00%	0.62%	99.84%	0.00%	0.00%	0.01%	0.00%	0.01%	0.16%	100.00%	160.64

**** Reloaded for additional sorting at another processor.**

Average by Commodity

	OCC	Mags	MSP	ONP	Other Groundwd	Paper-board	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PROHI-BITIVES**	TOTAL	Sample Weight
Residue	3.81%	0.36%	3.22%	0.86%	0.16%	1.70%	10.12%	4.84%	4.60%	20.33%	7.80%	37.57%	52.32%	100.00%	137.32
MSP **	7.49%	8.43%	50.67%	19.44%	2.55%	5.02%	93.60%	0.20%	0.17%	0.14%	0.25%	0.76%	5.63%	100.00%	130.89
OCC	88.54%	0.12%	0.70%	0.62%	0.40%	6.01%	96.38%	0.00%	0.02%	0.07%	0.22%	0.32%	3.30%	100.00%	159.97
ONP #6	0.18%	0.42%	1.24%	95.47%	0.09%	0.31%	97.72%	0.08%	0.06%	0.06%	0.11%	0.32%	1.96%	100.00%	167.84

Median by Commodity

Residue	3.63%	0.16%	1.61%	0.36%	0.02%	1.95%	9.58%	4.61%	4.60%	15.22%	7.01%	32.74%	55.40%	100.00%	129.95
MSP **	6.12%	8.88%	53.14%	18.60%	2.52%	5.58%	95.28%	0.08%	0.08%	0.14%	0.18%	0.59%	4.39%	100.00%	131.25
OCC	86.94%	0.00%	0.62%	0.28%	0.32%	3.78%	97.54%	0.00%	0.00%	0.03%	0.00%	0.18%	2.43%	100.00%	161.03
ONP #6	0.08%	0.43%	1.26%	97.27%	0.00%	0.25%	99.48%	0.05%	0.00%	0.03%	0.00%	0.10%	0.31%	100.00%	165.42

Range by Commodity

Residue															
Low	0.18%	0.00%	0.84%	0.11%	0.00%	0.09%	6.23%	1.42%	3.02%	6.48%	1.06%	27.72%	31.20%	100.00%	70.52
High	7.02%	1.32%	7.32%	2.70%	0.71%	2.79%	15.66%	9.13%	7.23%	57.08%	16.42%	62.58%	63.36%	100.00%	218.74
MSP															
Low	2.93%	0.00%	33.13%	10.13%	0.00%	1.99%	87.02%	0.00%	0.00%	0.00%	0.00%	0.12%	1.55%	100.00%	63.19
High	15.13%	14.61%	64.10%	34.30%	5.73%	7.46%	97.55%	0.74%	0.83%	0.39%	0.78%	1.52%	11.70%	100.00%	209.02
OCC															
Low	77.98%	0.00%	0.27%	0.07%	0.00%	0.58%	91.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.57%	100.00%	133.39
High	96.47%	0.67%	1.28%	2.74%	0.97%	15.44%	99.27%	0.00%	0.19%	0.23%	1.02%	1.02%	7.86%	100.00%	184.88
ONP #6															
Low	0.00%	0.00%	0.31%	83.39%	0.00%	0.08%	84.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	100.00%	142.83
High	0.62%	1.42%	2.34%	98.50%	0.34%	0.62%	99.93%	0.47%	0.35%	0.35%	0.60%	1.37%	14.03%	100.00%	191.26

Sampling Results at Processor H

					PAPER								OTHER MATERIALS								
Sample #	Facility Name	Material Source	Material Mixture	Product Sampled	OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other GroundW	Paperbd	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PRO-HIBITIVE**	TOTAL	Sample Weight
60403	Proc H	Comm	Fibers	Residue	1.36%	0.00%	0.00%	1.71%	17.01%	0.35%	10.89%	1.36%	32.69%	0.00%	0.14%	3.40%	0.14%	3.67%	63.64%	100.00%	36.74
60409	Proc H	Comm	Fibers	Residue	0.00%	0.00%	0.00%	9.96%	5.18%	0.00%	0.00%	0.00%	15.14%	0.00%	0.00%	5.18%	0.00%	5.18%	79.68%	100.00%	2.51
60407	Proc H	Comm	Fibers	OP #1	0.20%	0.00%	0.00%	2.73%	96.15%	0.00%	0.31%	0.31%	99.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	100.00%	123.77
60408	Proc H	Comm	Fibers	OP #1	0.35%	0.00%	0.00%	3.82%	93.33%	1.39%	0.14%	0.00%	99.02%	0.00%	0.00%	0.01%	0.07%	0.08%	0.90%	100.00%	180.28
60410	Proc H	Comm	Fibers	OP #1	0.00%	0.00%	0.00%	2.46%	95.45%	0.55%	0.48%	0.03%	98.97%	0.00%	0.00%	0.01%	0.00%	0.01%	1.03%	100.00%	182.82
60401	Proc H	Comm	Fibers	OP #2	0.03%	0.00%	0.00%	2.42%	93.67%	0.08%	1.13%	0.57%	97.90%	0.00%	0.00%	0.01%	0.32%	0.33%	1.77%	100.00%	155.20
60402	Proc H	Comm	Fibers	OP #2	0.24%	0.00%	0.00%	2.04%	95.37%	0.63%	0.63%	0.31%	99.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.78%	100.00%	159.38
60411	Proc H	Comm	Fibers	OP #2	0.15%	0.00%	0.00%	1.77%	95.39%	0.15%	0.31%	1.54%	99.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.69%	100.00%	162.76
60412	Proc H	Comm	Fibers	OP #2	0.00%	0.00%	0.00%	0.77%	96.30%	1.61%	0.43%	0.09%	99.20%	0.00%	0.00%	0.03%	0.00%	0.03%	0.77%	100.00%	147.45
60404	Proc H	Comm	Fibers	W.Ledger	0.00%	96.37%	0.92%	0.46%	1.92%	0.00%	0.00%	0.03%	99.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	100.00%	163.43
60405	Proc H	Comm	Fibers	W. Ledger	0.00%	98.35%	0.44%	0.27%	0.79%	0.00%	0.00%	0.07%	99.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	100.00%	182.76
60406	Proc H	Comm	Fibers	W. Ledger	0.00%	98.83%	0.39%	0.00%	0.58%	0.00%	0.00%	0.10%	99.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	100.00%	128.76

Average by Commodity

	OCC	White Ledger	Colored Ledger	Mags	MSP	ONP	Other Groundwd	Paper-board	**Paper Subtotal**	Glass Bottles	Plastic Bottles	Plastic Film	Metal	**Other Subtotal**	**PROHI-BITIVES**	TOTAL	Sample Weight
Residue	0.68%	0.00%	0.00%	5.84%	11.10%	0.18%	5.44%	0.68%	23.91%	0.00%	0.07%	4.29%	0.07%	4.43%	71.66%	100.00%	19.63
OP#1	0.18%	0.00%	0.00%	3.00%	94.97%	0.64%	0.31%	0.11%	99.23%	0.00%	0.00%	0.00%	0.02%	0.03%	0.75%	100.00%	162.29
OP#2	0.11%	0.00%	0.00%	1.75%	95.18%	0.62%	0.62%	0.63%	98.91%	0.00%	0.00%	0.01%	0.08%	0.09%	1.00%	100.00%	156.20
White Ledger	0.00%	97.85%	0.58%	0.24%	1.10%	0.00%	0.00%	0.07%	99.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.16%	100.00%	158.32

Median by Commodity

Residue	0.68%	0.00%	0.00%	5.84%	11.10%	0.18%	5.44%	0.68%	23.91%	0.00%	0.07%	4.29%	0.07%	4.43%	71.66%	100.00%	19.63
OP#1	0.20%	0.00%	0.00%	2.73%	95.45%	0.55%	0.31%	0.03%	99.02%	0.00%	0.00%	0.01%	0.00%	0.01%	0.90%	100.00%	180.28
OP#2	0.09%	0.00%	0.00%	1.90%	95.38%	0.39%	0.53%	0.44%	99.21%	0.00%	0.00%	0.00%	0.00%	0.02%	0.78%	100.00%	157.29
White Ledger	0.00%	98.35%	0.44%	0.27%	0.79%	0.00%	0.00%	0.07%	99.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	100.00%	163.43

Range by Commodity

Residue																	
Low	0.00%	0.00%	0.00%	1.71%	5.18%	0.00%	0.00%	0.00%	15.14%	0.00%	0.00%	3.40%	0.00%	3.67%	63.64%	100.00%	2.51
High	1.36%	0.00%	0.00%	9.96%	17.01%	0.35%	10.89%	1.36%	32.69%	0.00%	0.14%	5.18%	0.14%	5.18%	79.68%	100.00%	36.74
OP#1																	
Low	0.00%	0.00%	0.00%	2.46%	93.33%	0.00%	0.14%	0.00%	98.97%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	100.00%	123.77
High	0.35%	0.00%	0.00%	3.82%	96.15%	1.39%	0.48%	0.31%	99.69%	0.00%	0.00%	0.01%	0.07%	0.08%	1.03%	100.00%	182.82
OP#2																	
Low	0.00%	0.00%	0.00%	0.77%	93.67%	0.08%	0.31%	0.09%	97.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.69%	100.00%	147.45
High	0.24%	0.00%	0.00%	2.42%	96.30%	1.61%	1.13%	1.54%	99.31%	0.00%	0.00%	0.03%	0.32%	0.33%	1.77%	100.00%	162.76
White Ledger																	
Low	0.00%	96.37%	0.39%	0.00%	0.58%	0.00%	0.00%	0.03%	99.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	100.00%	128.76
High	0.00%	98.83%	0.92%	0.46%	1.92%	0.00%	0.00%	0.10%	99.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	100.00%	182.76

APPENDIX H

STATISTICAL SIGNIFICANCE OF SAMPLING RESULTS BY FIBER SOURCE AND MIXTURE

Appendix H

STATISTICAL SIGNIFICANCE OF SAMPLING RESULTS BY FIBER SOURCE AND MIXTURE

Appendix C and *Table C* present statistical significance of differences between average out-throw and prohibitive levels and total commodity contamination (out-throws plus prohibitives) for all fiber commodity samples in the study.

This appendix presents results for each commodity without regard to which facility produced the commodity, which source the commodity came from (residential or commercial), or what mixtures were processed (fibers only, fiber/TAP or single stream.)

Table C shows the statistical significance (in a sense, the reliability) of average out-throw and prohibitive levels for each commodity sampled and for apparent differences between commodities, based on confidence intervals that take into account the full range of results for all samples of these commodities. Use of the 90% confidence interval means that, were the measurements to be repeated many times, 90% of those times the average value would fall within the confidence intervals shown, and 10% of the time the value would be outside that confidence interval.

Explanation of confidence intervals. For the most part, confidence intervals in *Table C* bear out the significance of average differences between commodities. The same commodities likely would have higher or lower out-throw levels, prohibitives and contamination totals (out-throws plus prohibitives) than each other if more samples were taken. Minor overlap occurs at the upper or lower extremes between confidence intervals for some commodities, showing a statistical possibility, though not a likelihood, that average differences could reverse in another study.

When confidence intervals overlap <u>entirely</u> for any two materials (one pair of intervals falls entirely within the other), the average difference between the materials is not statistically significant at the 90% confidence level. Two commodities in *Table C* have entirely overlapping intervals for any factor measured, indicating that no significant difference can be asserted at the 90% confidence level.

- Out-throw intervals for OCC (0.23% - 0.38%) fall within the out-throw intervals for Paperboard/OCC (0.21% - 0.63%).
- Prohibitive and sort loss (prohibitive plus out-throw) intervals for Office Paper #2 encompass those of Office Paper #1. On the other hand, out-throw intervals for these two grades overlap only slightly, leaving OP#1 the cleaner commodity on average.

When two pairs of intervals overlap <u>partially</u>, as they do for several commodities, we cannot eliminate the possibility of significant differences without further statistical tests. In the absence of the need to make any key decisions related to differences between these commodities, the study team has not performed such tests. For example, <u>prohibitives</u> intervals for OCC (2.06% - 3.16%) partly overlap those for ONP#6 (1.36% - 2.81%). Therefore, the difference between average prohibitives for OCC (2.6%) and ONP#6 (2.1%) may or may not be significant at the 90% level of confidence. It is possible, and even likely (but not necessarily 90% likely), that more samples of these two commodities would continue to show similar average differences in prohibitives content.

On the other hand, <u>out-throw</u> intervals for these two commodities (OCC and ONP#6) do not overlap at all, which means the average out-throw differences (0.3% for OCC and 1.2% for ONP#6) are statistically significant at better than the 95% level. (The intervals for each commodity are calculated at the 90% confidence level; entirely non-congruent intervals establish differences at greater than 95% confidence.)

Caveats. It is important to recognize that this study did not control all factors that could influence outcomes. In some facilities, certain samples were taken from commercial loads that contained fibers only, while other samples at the same facility came from commercial Fiber/TAP mixtures or even commercial/residential mixtures. This sampling reflected the way the facilities receive, handle and sort loads on a regular basis, and the commodities they produce. More samples of more controlled mixtures over a longer time frame could change average results—though likely not outside the intervals shown, and not necessarily with more fidelity to the actual situation that exists at each facility.

Statisticians will hedge almost any assertion. When making paired comparisons between many members in a group (e.g., all the commodities), some comparisons may appear to be statistically significant when in fact they could be the one time in 20 when results just happen to exceed the 95% confidence interval by chance. If paired comparisons are made between eight individual items, a total of 21 comparisons will be made. Because a false significance finding is expected about once for each 20 comparisons (using the 95% significance level), it would be expected that an average of one comparison, just by chance, would appear to show a significant difference, even if all of the groups were in fact (would be found over many more samples) equivalent to each other.

That said, 19 times out of 20, the comparisons would hold up.

Samples of partially sorted material that will be shipped to a second processor introduce another variable, and perhaps should be considered separately from samples of commodities going directly to end-use markets. Sampling reloaded ONP#6 and MSP at two facilities may have skewed results for these two grades as well as for the two facilities reloading these commodities. Nonetheless, Metro staff research found that the out-throws and prohibitives in these reloads would not be recovered by the secondary sorters, indicating if not statistically proving that reloading results in contamination levels and loss of recyclables as measured.

Out-throws. Significant (95% level) out-throw differences among commodities, shown in Table B.1, are as follows:

1. White Ledger and Office Pack #1 both have out-throw confidence intervals significantly lower than any other commodity. These materials are produced from commercial fibers only.

2. Office Pack #2 has significantly lower out-throw intervals than any commodity except White Ledger and Office Pack #1, and OP#2 out-throw intervals only slightly overlap the lower extremes of OCC and Paperboard/OCC. OP#2 is produced from commercial fibers only.

3. OCC and Paperboard/OCC have out-throw levels significantly lower than ONP#6 and MSP.

4. ONP#7 (average out-throws of 0.48%) has confidence intervals significantly lower than ONP#6 and Mixed scrap paper, but not statistically different from Paperboard/OCC and slightly overlapping OCC.

5. ONP#6 (average 1.18% out-throws) and Mixed scrap paper (average 1.31%) have nearly overlapping confidence intervals that both are higher than for all other commodities.

Prohibitives. Significant (95% level) prohibitives differences among these commodities, as shown in Table B.1, are as follows:

1. White Ledger (0.24% - 0.60%) and Office Pack #1 (0.61% - 1.18%) both have prohibitives intervals entirely lower than those for OCC, ONP#6, Mixed scrap paper and Paperboard/OCC.

2. Office Pack #2 (0.40% - 1.61%) has prohibitives intervals that entirely overlap (enclose) those for Office Pack #1, but are entirely lower than for OCC and Mixed scrap paper. (The higher end of the interval for OP#2 overlaps the lower extremes for ONP#6 and Paperboard/OCC).

3. ONP#7 prohibitives intervals (0.55% - 0.81%) are lower than those for OCC, ONP#6, MSP or Paperboard/OCC.

4. ONP#6 prohibitives intervals (1.39% - 2.81%) are entirely lower only than those for Mixed scrap paper (4.1% - 5.66%).

Sort loss (out-throws plus prohibitives). Significant (95% level) sort loss differences among these commodities, as shown in Table B.1, are as follows:

1. White Ledger (0.29% - 0.76%) is significantly lower than OCC (2.35% - 3.46%), ONP#6 (2.32% - 4.24%), ONP#7 (0.96% - 1.36%), MSP (5.22% - 7.17%) and Paperboard/OCC (1.67% to 3.24%). White Ledger overlaps both Office Paper grades.

2. Office Pack #2 (0.40% - 1.61%) has prohibitives intervals that entirely overlap (enclose) those for Office Pack #1, but are entirely lower than for OCC and Mixed scrap paper. (The higher end of the interval for OP#2 overlaps the lower extremes for ONP#6 and Paperboard/OCC).

3. ONP#7 prohibitives intervals (0.55% - 0.81%) are lower than those for OCC, ONP#6, MSP or Paperboard/OCC.

4. ONP#6 prohibitives intervals (1.39% - 2.81%) are entirely lower only than those for Mixed scrap paper (4.1% - 5.66%).

Table H presents the means and confidence intervals associated out-throws, prohibitives and total contamination from different fiber sources and mixtures. Total contamination is the sum of out-throws and prohibitives. Differences between fiber sources and mixtures are statistically significant at the 95% level when the confidence intervals do not overlap. If the confidence intervals have some degree of overlap, there may be a statistical difference at the 90% level. However, further testing would need to be done, which was not part of this analysis.

The key observations from Table H are:

- Differences between commercial fibers-only processor samples and the single-stream processor sample were statistically significant at the 95% level for out-throws, prohibitives and total contamination.
- Fiber/TAP samples from either residential or commercial sources were not statistically significant at the 95% level from fibers-only or single-stream processor samples.

TABLE H: Confidence Intervals for Contamination Levels, By Facility

Commingled Commercial Recyclables Processing (May/June 2002)

Percentages of Out-Throws and Prohibitives in Fiber Commodities, with Total Contamination Segregated by Source and Mixture of Material Processed (Averages; Facilities Indicated That Handle Each Type of Source/Mixture)

Source, Mixture (Facility)	Glass Bottles	Plastic Bottles	Plastic Film	Metal	Out-Throw Subtotal	Confidence Interval 90%	Prohibi-tives	Confidence Interval 90%	Total Contamination	Confidence Interval 90%
All Fiber Samples (All Facilities)	0.06%	0.29%	0.09%	0.20%	**0.65%**	(0.50-0.80%)	**2.33%**	(2.02-2.63%)	**2.98%**	(2.60-3.35%)
Commercial Fiber Only (A,E,H)	0.03%	0.01%	0.06%	0.02%	**0.12%**	(0.07-0.16%)	**1.28%**	(0.92-1.64%)	**1.40%**	(1.03-1.77%)
Commercial Fibers (G)	0.11%	0.10%	0.09%	0.20%	**0.50%**	(0.35-0.65%)	**3.79%**	(2.63-4.94%)	**4.28%**	(3.01-5.56%)
Com/Res Fiber and Fiber/TAP (D)	0.01%	0.22%	0.14%	0.16%	**0.52%**	(0.39-0.65%)	**1.97%**	(1.20-2.74%)	**2.49%**	(1.64-3.34%)
Com. Fiber & Com/Res Fiber/TAP (C)	0.05%	0.06%	0.04%	0.13%	**0.27%**	(0.19-0.36%)	**2.06%**	(1.29-2.83%)	**2.34%**	(1.54-3.13%)
Commercial Fiber/TAP (B)	0.07%	0.87%	0.15%	0.36%	**1.45%**	(0.71-2.20%)	**3.42%**	(2.43-4.42%)	**4.88%**	(3.53-6.22%)
Com/Res Single Stream (F)	0.14%	0.82%	0.11%	0.55%	**1.62%**	(0.97-2.28%)	**2.35%**	(1.93-2.76%)	**3.97%**	(3.11-4.83%)

APPENDIX I

CONTAINER LOSS AT PROCESSORS

Appendix I
Container Loss at Processors

Commingled Containers and Plastic Film in 2000, in tons

Program	Source Separated	Commingled	Total
Residential curbside	12,883	6,318	19,201
Commercial	1,933	8,603	10,535
Subtotal	14,816	14,921	29,736
Bottle Bill containers	35,205	0	35,205
Total marketed	50,021	14,921	64,941

Commingled Container Flow, in tons [1]

Containers and film marketed	14,921	86%
Container loss		
Processor residue	1,112	6%
Out-throws to mills	1,349	8%
Total Container Loss	2,461	14%
Delivered to processor	17,382	100%

[1] Includes glass, plastic and metal containers; scrap metal and plastic film.

Source: Oregon DEQ recovery data; Metro hauler reports.

APPENDIX J

LOSS OF RECYCLABLES AND CONTAMINATION AT MARKETS

APPENDIX J: Loss of Recyclables and Contamination at Markets

Table J1 -- Metro region fiber recovery by grade in 2000, in tons

Commodities (1)	All Fiber (2)	Residential Commingled (3)	Commercial Hauler Commingled (4)	Total Commingled	Commingled Percent of All Fiber
OCC	170,507	14,855	15,015	29,870	18%
ONP	122,620	50,051	10,798	60,849	50%
High Grade	41,101	150	3,619	3,769	9%
Mixed Paper	74,181	34,273	6,532	40,806	55%
TOTAL	408,409	99,329	35,964	135,293	33%

(1) The commodities are the marketed grades as reported by Oregon DEQ in its annual recovery report.
(2) All fiber is the total of source-separated collection, mostly from private recycling collectors, and commingled collection from haulers.
(3) Residential fiber is 26% of all fiber from DEQ in 2000. Commingled fiber is 93% of residential fiber based on hauler reports in 2001.
(4) Commercial fiber is 74% of all fiber in 2000. Hauler fiber is 34% of all commercial fiber. Commingled fiber is 35% of commercial hauler fiber based on hauler reports in 2001.

Table J2 -- Contamination by fiber grade

Commodities	Mean Out-throws(1) ·cent	Mean Prohibitives (2) ·cent	Mean Contamination (3) ·cent	High Out-throws(1) ·cent	High Prohibitives (2) ·cent	High Contamination (3) ·cent
OCC	0.31%	2.61%	2.92%	0.38%	3.16%	3.46%
ONP #6	1.18%	2.10%	3.28%	1.67%	2.81%	4.24%
High Grade/ White Ledger	0.11%	0.42%	0.53%	0.18%	0.60%	0.76%
Mixed Scrap Paper	1.31%	4.88%	6.19%	1.84%	5.66%	7.17%

Note: The "mean" out-throw represents the current mix of commingling sorts. As more fibers and containers get mixed, e.g., Fiber/TAP, then there will be greater contamination. The "high" out-throw value was selected to represent this situation.
(1) Non-paper recyclables, such as bottles, mis-sorted into paper that will be garbage at the mill.
(2) All non-recyclable materials, e.g. plastic toys.
(3) Total contamination is the sum of out-throws and prohibitives at the mill, ie garbage.

Scenario A: Current Commingling Mixes, Volume of Commingled Fiber Unchanged (1)

Commodities	Mean Out-throws tons	Mean Prohibitives tons	Mean Contamination (2) tons
OCC	93	780	872
ONP	718	1,278	1,996
High Grade	4	16	20
Mixed Paper	535	1,991	2,526
TOTAL	1,349	4,065	5,414
PERCENT of COMMINGLED	**1.0%**	**3.0%**	**4.0%**

(1) Assumes mean out-throws, prohibitives and contamination generated from 135,293 tons of commingled fiber.
(2) Total contamination is the sum of out-throws and prohibitives.

Scenario B: More Containers in Fiber, Volume of Commingled Fiber Unchanged

Commodities	High Out-throws tons	High Prohibitives tons	High Contamination (2) tons
OCC	114	944	1,033
ONP	1,016	1,710	2,580
High Grade	7	23	29
Mixed Paper	751	2,310	2,926
TOTAL	1,887	4,986	6,568
PERCENT of COMMINGLED	**1.4%**	**3.7%**	**4.9%**

(1) Assumes greater commingling (fiber/TAP) so high values from confidence intervals for out-throws, prohibitives and contamination are applied to the 135,293 tons of commingled fiber generated.
(2) Total contamination is the sum of out-throws and prohibitives.

Scenario C: More Containers in Fiber, All Fiber is Commingled (1)

Commodities	High Out-throws tons	High Prohibitives tons	High Contamination (2) tons
OCC	648	5,388	5,900
ONP	2,048	3,446	5,199
High Grade	74	247	312
Mixed Paper	1,365	4,199	5,319
TOTAL	4,135	13,279	16,730
PERCENT of ALL FIBER	**1.0%**	**3.3%**	**4.1%**

(1) Assumes greater commingling (fiber/TAP) so high values from confidence intervals for out-throws, prohibitives and contamination are used. Also assumes all fiber, or 408,409 tons, is now collected commingled as fiber/TAP.
(2) Total contamination is the sum of out-throws and prohibitives.