Seattle Public Utilities

1994/95

Residential Waste Stream Composition Study

Final Report

prepared by

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in cooperation with

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1. Overview

1.1 Introduction

Effective solid waste management planning begins with knowing what is in the waste stream—how much of which types of material is disposed by each generator type. This basic information is essential to all aspects of policy and program implementation. Thus, the City of Seattle's Solid Waste Utility launched an ongoing waste composition study in 1988. Objectives for the project include:

- obtaining information for characterizing the total waste stream;
- establishing a baseline for continued long-term measurement of system performance;
- understanding the differences between substreams so that specialized recycling programs can be designed, implemented, and monitored;
- determining waste generation factors for various residential and commercial substreams, thereby enabling the City to forecast future composition; and
- creating a database for ongoing evaluation and analysis of waste composition sampling data.

This report summarizes the results of Seattle's 1994-95 waste composition study. The number of samples taken throughout the project's history is listed in Table 1-1.

Table 1-1 Samples per Study Period, by Substream

	Number of Samples			
Year	**Commercial**	**Residential**	**Self-Haul**	**Overall**
1988-89	121	212	217	550
1990	0	114	203	317
1992	251	0	197	448
1994-95	0	368	0	368

This report provides composition estimates for Seattle's residential waste, based on sampling conducted from May 1994 through May 1995. Cascadia Consulting Group served as the prime contractor for this research, Sky Valley Associates conducted the fieldwork, Hopkins Environmental performed the data-entry, Elway Research designed the sampling methodology and E. Ashley Steel provided statistical analysis.

The report is organized into three segments: Section 1 briefly summarizes the results and compares them to 1990 findings, Section 2 outlines the methodology and Section 3 describes the results in detail. Six appendices provide further information regarding waste component definitions, monthly sampling events, the full methodology and the project's database.

1.2 Summary of 1994/95 Sampling Results

1.2.1 Overall Residential

The overall characterization of Seattle's 1994/95 residential waste stream is displayed in Figure 1-1.

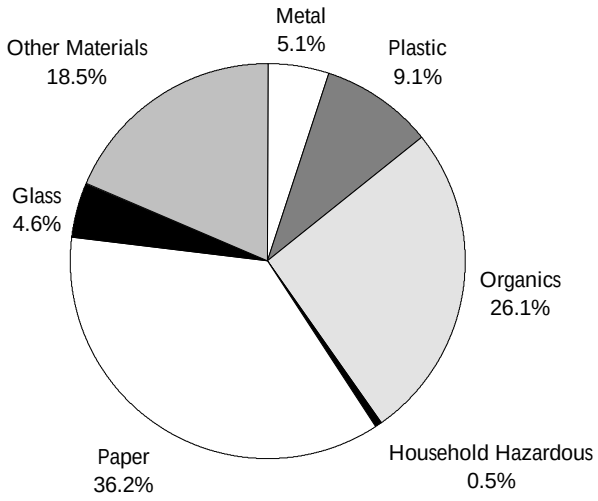
As shown, the paper and organics categories account for most (62.3%) of the tonnage disposed. On a more detailed level, the five most prevalent materials comprised more than half (53.2%) of the residential waste stream:

- Food 20.1%
- Mixed Low Grade Paper 10.4%
- Compostable/Soiled Paper 10.4%
- Newspaper 6.2%
- OCC/Kraft Paper 6.1%

Please see Section 3.2 for more information regarding the overall residential waste characterization.

Figure 1-1 Composition by Weight: Overall Residential

May 1994 - May 1995



	Tons	Mean %	Low %	High %		Tons	Mean %	Low %	High %
PAPER	**52,668**	**36.2%**			**ORGANICS**	**37,973**	**26.1%**		
Newspaper	9,073	6.2%	5.3%	7.2%	Untreated Wood	1,614	1.1%	0.9%	1.4%
OCC/Kraft	8,950	6.1%	5.5%	6.8%	Crates/Pallets	313	0.2%	0.0%	0.4%
Office Paper	875	0.6%	0.5%	0.7%	Treated Wood	1,609	1.1%	0.8%	1.4%
Computer Paper	25	0.0%	0.0%	0.0%	Leaves and Grass	3,896	2.7%	2.0%	3.3%
Mixed Low Grade	15,185	10.4%	9.5%	11.4%	Prunings	1,245	0.9%	0.4%	1.3%
Phone Books	356	0.2%	0.1%	0.3%	Food	29,295	20.1%	19.0%	21.3%
Milk/Juice Polycoats	1,224	0.8%	0.8%	0.9%	**OTHER MATERIALS**	**26,912**	**18.5%**		
Frozen Food Polycoats	411	0.3%	0.2%	0.3%	Textiles	2,956	2.0%	1.8%	2.3%
Compostable/Soiled	15,150	10.4%	9.6%	11.2%	Carpet/Upholstery	3,338	2.3%	1.6%	3.0%
Paper/Other Materials	1,231	0.8%	0.7%	1.0%	Leather	61	0.0%	0.0%	0.1%
Other Paper	189	0.1%	0.1%	0.2%	Disposable Diapers	4,747	3.3%	2.9%	3.6%
PLASTIC	**13,249**	**9.1%**			Animal By-Products	4,477	3.1%	2.7%	3.5%
PET Pop & Liquor	544	0.4%	0.3%	0.4%	Rubber Products	385	0.3%	0.2%	0.3%
Other PET Bottles	102	0.1%	0.1%	0.1%	Tires	56	0.0%	0.0%	0.1%
HDPE Pop & Liquor	487	0.3%	0.3%	0.4%	Ash	69	0.0%	0.0%	0.1%
Other HDPE Bottles	420	0.3%	0.3%	0.3%	Furniture	423	0.3%	0.1%	0.5%
Other Plastic Bottles	536	0.4%	0.3%	0.4%	Mattresses	87	0.1%	0.0%	0.1%
Other Rigid Containers	686	0.5%	0.4%	0.5%	Small Appliances	731	0.5%	0.2%	0.8%
Expanded Polystyrene	751	0.5%	0.5%	0.6%	A/V Equipment	224	0.2%	0.1%	0.2%
Other Rigid Packaging	762	0.5%	0.5%	0.6%	Ceramics/Porcelain	367	0.3%	0.2%	0.3%
Grocery/Bread Bags	2,576	1.8%	1.6%	1.9%	Gypsum Drywall	1,536	1.1%	0.6%	1.6%
Other Film	4,213	2.9%	2.7%	3.1%	Fiberglass Insulation	38	0.0%	0.0%	0.0%
Plastic Products	1,409	1.0%	0.8%	1.1%	Rock/Concrete/Brick	667	0.5%	0.3%	0.6%
Plastic/Other Materials	764	0.5%	0.4%	0.6%	Construction Debris	797	0.5%	0.4%	0.7%
GLASS	**6,684**	**4.6%**			Sand/Soil/Dirt	1,582	1.1%	0.8%	1.4%
Clear Beverage	2,383	1.6%	1.5%	1.8%	Non-distinct Fines	3,375	2.3%	2.0%	2.7%
Green Beverage	1,465	1.0%	0.9%	1.2%	Misc. Organics	525	0.4%	0.3%	0.4%
Brown Beverage	1,166	0.8%	0.7%	0.9%	Misc. Inorganics	469	0.3%	0.2%	0.4%
Container Glass	1,213	0.8%	0.7%	1.0%	**HOUSEHOLD HAZARDOUS**	**670**	**0.5%**		
Other Glass	458	0.3%	0.2%	0.4%	Latex Paints	139	0.1%	0.0%	0.2%
METAL	**7,435**	**5.1%**			Adhesives/Glues	80	0.1%	0.0%	0.1%
Aluminum Cans	770	0.5%	0.5%	0.6%	Oil-based Paints/Solvents	30	0.0%	0.0%	0.0%
Alum. Foil/Containers	326	0.2%	0.2%	0.2%	Cleaners	14	0.0%	0.0%	0.0%
Other Aluminum	79	0.1%	0.0%	0.1%	Pesticides/Herbicides	27	0.0%	0.0%	0.0%
Tin Food Cans	2,156	1.5%	1.4%	1.6%	Dry-Cell Batteries	269	0.2%	0.1%	0.3%
Ferrous	2,032	1.4%	1.0%	1.8%	Wet-Cell Batteries	0	0.0%	0.0%	0.0%
Nonferrous	41	0.0%	0.0%	0.0%	Gasoline/Kerosene	0	0.0%	0.0%	0.0%
Mixed Metals/Materials	2,031	1.4%	1.0%	1.8%	Motor Oil/Diesel Oil	25	0.0%	0.0%	0.0%
					Asbestos	0	0.0%	0.0%	0.0%
					Explosives	0	0.0%	0.0%	0.0%
Total Tons	**145,591**	***Sample Count***		**368**	Other Chemicals	86	0.1%	0.0%	0.1%

1.2.2 By Subpopulation

Composition estimates were calculated for the following Seattle residential sectors:

- by residence type
- by service area
- by season
- by household income
- by household size

Table 1-2 lists all components accounting for more than 5% of any subpopulation's waste. As shown, the same five materials–food and four paper categories–comprise approximately half of nearly every sector's waste stream. (Large households are one exception, with leaves and grass accounting for 5.4% of the disposed waste.)

Detailed results for each subpopulation are presented in Sections 3.3 through 3.6.

Table 1-2 Largest Waste Components, by Sector
May 1994 - May 1995

Subpopulation	Food	Compostable / Soiled Paper	Mixed Low Grade Paper	Newspaper	OCC/Kraft Paper	Leaves & Grass	Sum of Largest Components
Single-Family	23.8%	11.3%	9.7%		5.0%		**49.8%**
Multi-Family	15.5%	9.3%	11.3%	9.3%	7.5%		**52.9%**
North Service Area	18.9%	10.5%	11.4%	7.1%	6.4%		**54.3%**
South Service Area	22.5%	10.3%	8.4%		5.5%		**46.7%**
Spring (Mar., Apr., May)	22.7%	10.2%	8.4%		6.0%		**47.3%**
Summer (Jun., Jul., Aug.)	22.6%	13.2%	11.3%		5.5%		**52.6%**
Fall (Sept., Oct., Nov.)	20.0%	9.8%	10.7%	6.9%	6.0%		**53.4%**
Winter (Dec, Jan., Feb.)	16.9%	9.7%	11.5%	8.0%	6.7%		**52.8%**
Low Income (< $26,615)	25.1%	11.1%	9.1%				**45.3%**
Medium Income (> $26,614 and < $35,895)	23.6%	11.7%	9.6%		5.0%		**49.9%**
High Income (> $35,894)	23.5%	10.5%	10.6%		5.4%		**50.0%**
Small Household (< 2.05)	23.4%	11.0%	10.9%				**45.3%**
Large Household (> 2.48)	24.7%	11.2%	8.3%			5.4%	**49.6%**
Overall Residential	**20.1%**	**10.4%**	**10.4%**	**6.2%**	**6.1%**		**53.2%**

1.2.3 Changes in Composition, 1990 vs. 1994

The seven major waste category groups (shown in Figure 1-1, above) were compared across years. From 1990 to 1994, the relative amount of plastic and glass in Seattle's residential waste stream decreased and the fraction of organic wastes increased. Table 1-3 lists the changes. Variations in the relative amount of metal, household hazardous and other materials were not statistically significant, while the paper category calculations showed borderline results. Please see Appendix E for a full description of the statistical methodology.

Table 1-3 Statistically Significant Changes in Composition
Residential Waste Streams, 1990 to 1994

	Mean Composition	
	1990	*1994*
Plastic	12.6%	9.6%
Glass	5.9%	4.3%
Organics	22.3%	27.8%

2. Methodology

2.1 Source of Disposed Waste

For any specific geographic area, the total waste stream is composed of various substreams. A "substream" is determined by the particular generation, collection, or composition characteristics which make it a unique portion of the total waste stream. In the 1994/95 project, only the residential substream was studied. *No self-haul or commercial loads were sampled.* For comparison purposes, the residential sector was divided into single- and multi-family substreams, defined in Table 2-1.

Table 2-1 Definition of Residential Substreams [1]

Substream	Housing Type	Waste Collection
Single-Family	primarily detached single-family, duplex, triplex or fourplex	City-contracted hauler, from waste cans
Multi-Family	primarily apartments or condominiums with 5 or more units	City-contracted hauler, from dumpsters

It should be noted that this study measures waste disposal, not generation. (Waste generation equals the sum of disposed and recycled amounts.) The samples were taken from loads destined for the landfill and do not include tonnage collected through recycling programs.

[1] Because trucks sometimes collect waste from both cans and dumpsters, a small portion of material believed to be pure multi-family may have actually contained a percentage of single-family waste.

2.2 Sample Selection

At least 360 samples were to be sorted. Actual counts slightly exceeded this goal, for a total of 368 samples measured during May 1994-May 1995. Table 2-2 lists the planned and actual number of samples.

Table 2-2 Planned vs. Actual Sample Count
May 1994 - May 1995

Site	Substream	Planned Samples		Actual Samples	
North	Single-Family	192		197	
	Multi-Family	48		47	
	Overall	240	67%	244	66%
South	Single-Family	96		100	
	Multi-Family	24		24	
	Overall	120	33%	124	34%
Total		**360**		**368**	

Samples were allocated to the north and south service areas, and to the single- and multi-family substreams, according to the best available estimates of tonnage from these areas. Afterwards, more accurate data were available; the actual single- and multi-family proportions were found to be substantially different from the initial disposal estimates.

In order to accurately characterize the overall residential waste stream, weighting factors were calculated to compensate for the estimating error. The factors adjust the sampling data so that the relative influence of each sector reflects Seattle's actual residential tonnage distribution. For more detail, please see Appendix D.

Sampling was conducted on two consecutive days each month. Approximately 15 loads were randomly selected from the "universe" of loads expected to arrive at the sorting location that day. Because more samples were needed from the north area, more sampling days were scheduled there and the north area hauler was asked to occasionally divert loads south for sampling.

Samples of 200 to 300 pounds were mechanically extracted from the vehicle loads and sorted by hand into the prescribed component categories defined in Appendix A. The sorted materials were then weighed. The raw data were checked by the Director of Field Operations, then transmitted to the data entry contractor who input the information into a database designed for this project.

Please see Appendix B for a description of the sampling and sorting methodologies.

2.3 Changes in Methodology: 1990 vs. 1994

The sorting methodology used in this project is different from 1990's in three respects.

- As part of an effort to evaluate the success of recycling and waste reduction programs, "waste reduction indicators" are now studied. Results of the waste indicator research are presented in Section 4.
- The component categories were revised to provide more detail about specific materials in the waste stream. These category changes are tracked in Appendix A.
- Revisions to the component categories—particularly the addition of the "miscellaneous organics" and "miscellaneous inorganics" classifications—significantly decreased the amount and incidence of "supermix" (a residue composed of mixed material, each piece smaller than one half inch). In the rare cases when supermix did remain after sorting the major categories (never more than 10 pounds), the composition was visually estimated. In 1990, a sub-sample of the supermix was sorted.

The statistics employed to identify significant differences between substreams have been refined for the 1994-95 study. For a full description of these calculations, refer to Appendix E.

3. Composition Results

3.1 Overview

All results were derived using a 90% confidence level. This means there is a 90% certainty that the actual composition is within the calculated range. In waste composition charts throughout this report, the values graphed represent the mean component percentage, not the range.

As mentioned in Section 2.2, the proportions used to determine the number of samples allocated to the north and south service areas, and to the single- and multi-family substreams, were later found to be inaccurate. In order to reflect Seattle's actual residential tonnage distribution, weighted averages were calculated across the relevant sectors for each summary waste characterization (overall residential, single-family, multi-family, north service area and south service area). The other waste characterizations presented in this report (by season and household demographics), and the statistical analyses, are unaffected by the sampling misallocation and therefore are not weighted.

Composition estimates were calculated for the following populations:

- overall residential
- by residence type
- by service area
- by season
- by household income
- by household size

Descriptive data about the each sub-group's samples are summarized in Table 3-1.

Table 3-1 Number, Average Size and Sum of Samples, by Subpopulation
May 1994 - May 1995

Subpopulation	Sample Count	Average Sample (lbs)	Sum of Samples (lbs)	Average Load (lbs)
Single-Family	297	238	70,580	13,735
Multi-Family	71	261	18,558	14,895
North Service Area	244	242	59,124	13,956
South Service Area	124	242	30,014	13,963
Spring (Mar., Apr., May)	170	231	24,664	13,615
Summer (Jun., Jul., Aug.)	96	265	25,407	14,653
Fall (Sept., Oct., Nov.)	92	239	22,002	13,645
Winter (Dec, Jan., Feb.)	73	234	17,065	13,944
Low Income (< $26,615)	59	245	14,433	14,160
Medium Income (> $26,614 and < $35,895)	88	234	20,604	13,939
High Income (> $35,894)	77	237	18,204	13,678
Small Household (< 2.05)	59	222	13,094	15,008
Large Household (> 2.48)	63	250	15,776	13,151
Overall Residential	368	242	89,138	13,959

Differences between single- vs. multi-family and north vs. south disposed wastes were measured using t-tests, with a correction for the number of tests performed (thus reducing the risk of falsely identifying statistically significant differences). The number of samples taken during this study permits the detection of very small, yet statistically significant, differences. Please see Appendix E for more details.

Waste categories were chosen for the comparisons using the following criteria:

- Measure the degree to which residents are removing recyclables from the disposed waste stream.
  Comprehensive recycling programs, available to single-and multi-family homes throughout the city, collect all the materials listed in Table 3-2, except those in the non-curbside plastic, household hazardous and food categories.
- Gauge the amount of other plastic products (that are not accepted in current recycling programs) present in different sector's waste streams.
- Examine potential variations in the amount of household hazardous and food wastes disposed by different sectors.

Table 3-2 lists the selected category groups.

Table 3-2 Material Groupings Used for Comparisons

Comparison Label	Sampling Component	Comparison Label	Sampling Component
Newspaper	Newspaper	Curbside Glass	Clear Beverage
OCC/Kraft	OCC/Kraft		Green Beverage
Curbside Paper	Office Paper		Brown Beverage
	Computer Paper		Container Glass
	Mixed Low Grade	Tin	Tin Food Cans
	Phone Books	Yard Debris	Leaves and Grass
Curbside Plastic	PET Pop & Liquor		Prunings
	Other PET Bottles	Food	Food
	HDPE Pop & Liquor	Household Hazardous	Latex Paints
	Other HDPE Bottles		Adhesives/Glues
Non-Curbside Plastic	Other Plastic Bottles		Oil-based Paints/Solvents
	Other Rigid Containers		Cleaners
	Expanded Polystyrene		Pesticides/Herbicides
	Other Rigid Packaging		Dry-Cell Batteries
	Grocery/Bread Bags		Wet-Cell Batteries
	Other Film		Gasoline/Kerosene
	Plastic Products		Motor Oil/Diesel Oil
	Plastic/Other Materials		Asbestos
Aluminum	Aluminum Cans		Explosives
	Alum. Foil/Containers		Other Chemicals

3.2 Overall Residential

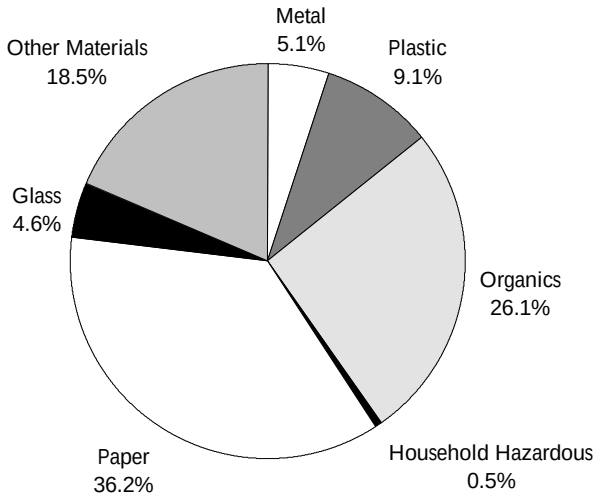
The overall characterization of Seattle's 1994/95 residential waste stream is displayed in Figure 3-1.

As shown, the paper and organics categories account for most (62.3%) of the tonnage disposed. On a more detailed level, five materials comprised more than half (53.2%) of the residential waste stream:

- Food 20.1%
- Mixed Low Grade Paper 10.4%
- Compostable/Soiled Paper 10.4%
- Newspaper 6.2%
- OCC/Kraft Paper 6.1%

Figure 3-1 Composition by Weight: Overall Residential

May 1994 - May 1995



	Tons	Mean %	Low %	High %
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Paper/Other Materials	1,231	0.8%	0.7%	1.0%
Other Paper	189	0.1%	0.1%	0.2%
PLASTIC	**13,249**	**9.1%**		
PET Pop & Liquor	544	0.4%	0.3%	0.4%
Other PET Bottles	102	0.1%	0.1%	0.1%
HDPE Pop & Liquor	487	0.3%	0.3%	0.4%
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Other Plastic Bottles	536	0.4%	0.3%	0.4%
Other Rigid Containers	686	0.5%	0.4%	0.5%
Expanded Polystyrene	751	0.5%	0.5%	0.6%
Other Rigid Packaging	762	0.5%	0.5%	0.6%
Grocery/Bread Bags	2,576	1.8%	1.6%	1.9%
Other Film	4,213	2.9%	2.7%	3.1%
Plastic Products	1,409	1.0%	0.8%	1.1%
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Clear Beverage	2,383	1.6%	1.5%	1.8%
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Container Glass	1,213	0.8%	0.7%	1.0%
Other Glass	458	0.3%	0.2%	0.4%
METAL	**7,435**	**5.1%**		
Aluminum Cans	770	0.5%	0.5%	0.6%
Alum. Foil/Containers	326	0.2%	0.2%	0.2%
Other Aluminum	79	0.1%	0.0%	0.1%
Tin Food Cans	2,156	1.5%	1.4%	1.6%
Ferrous	2,032	1.4%	1.0%	1.8%
Nonferrous	41	0.0%	0.0%	0.0%
Mixed Metals/Materials	2,031	1.4%	1.0%	1.8%
Total Tons	**145,591**	***Sample Count***		**368**

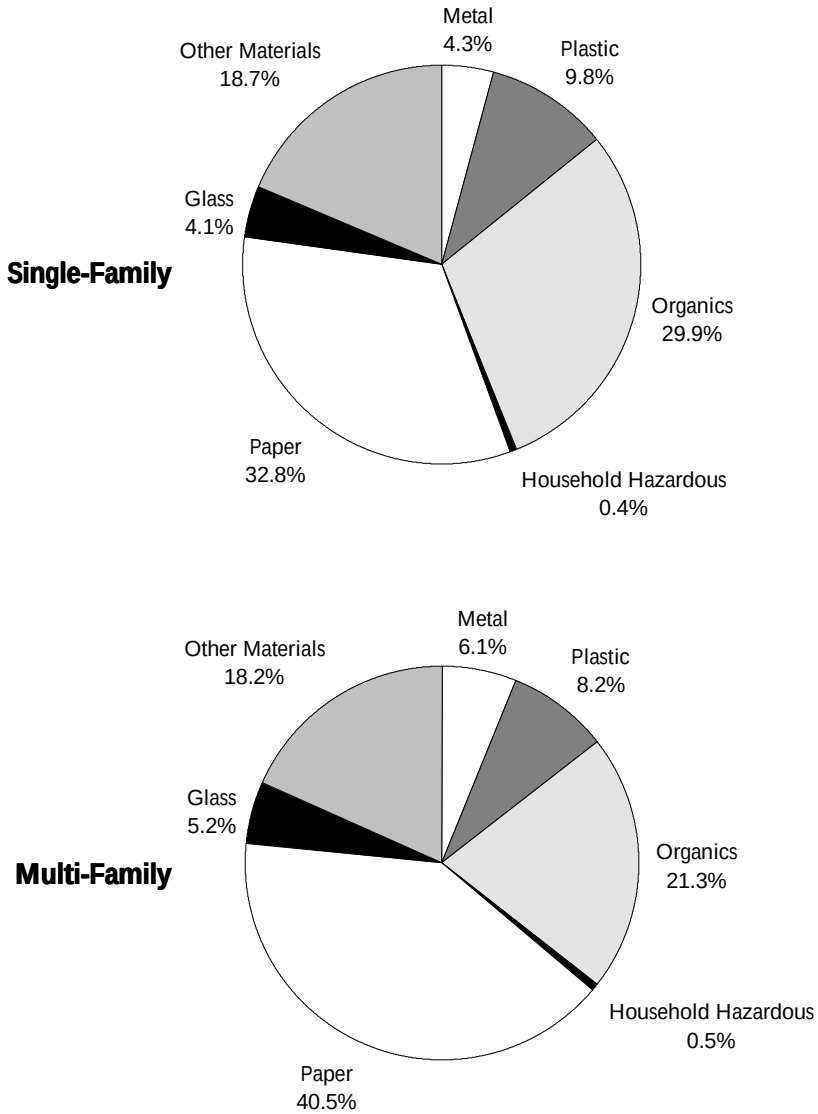
	Tons	Mean %	Low %	High %
ORGANICS	**37,973**	**26.1%**		
Untreated Wood	1,614	1.1%	0.9%	1.4%
Crates/Pallets	313	0.2%	0.0%	0.4%
Treated Wood	1,609	1.1%	0.8%	1.4%
Leaves and Grass	3,896	2.7%	2.0%	3.3%
Prunings	1,245	0.9%	0.4%	1.3%
Food	29,295	20.1%	19.0%	21.3%
OTHER MATERIALS	**26,912**	**18.5%**		
Textiles	2,956	2.0%	1.8%	2.3%
Carpet/Upholstery	3,338	2.3%	1.6%	3.0%
Leather	61	0.0%	0.0%	0.1%
Disposable Diapers	4,747	3.3%	2.9%	3.6%
Animal By-Products	4,477	3.1%	2.7%	3.5%
Rubber Products	385	0.3%	0.2%	0.3%
Tires	56	0.0%	0.0%	0.1%
Ash	69	0.0%	0.0%	0.1%
Furniture	423	0.3%	0.1%	0.5%
Mattresses	87	0.1%	0.0%	0.1%
Small Appliances	731	0.5%	0.2%	0.8%
A/V Equipment	224	0.2%	0.1%	0.2%
Ceramics/Porcelain	367	0.3%	0.2%	0.3%
Gypsum Drywall	1,536	1.1%	0.6%	1.6%
Fiberglass Insulation	38	0.0%	0.0%	0.0%
Rock/Concrete/Brick	667	0.5%	0.3%	0.6%
Construction Debris	797	0.5%	0.4%	0.7%
Sand/Soil/Dirt	1,582	1.1%	0.8%	1.4%
Non-distinct Fines	3,375	2.3%	2.0%	2.7%
Misc. Organics	525	0.4%	0.3%	0.4%
Misc. Inorganics	469	0.3%	0.2%	0.4%
HOUSEHOLD HAZARDOUS	**670**	**0.5%**		
Latex Paints	139	0.1%	0.0%	0.2%
Adhesives/Glues	80	0.1%	0.0%	0.1%
Oil-based Paints/Solvents	30	0.0%	0.0%	0.0%
Cleaners	14	0.0%	0.0%	0.0%
Pesticides/Herbicides	27	0.0%	0.0%	0.0%
Dry-Cell Batteries	269	0.2%	0.1%	0.3%
Wet-Cell Batteries	0	0.0%	0.0%	0.0%
Gasoline/Kerosene	0	0.0%	0.0%	0.0%
Motor Oil/Diesel Oil	25	0.0%	0.0%	0.0%
Asbestos	0	0.0%	0.0%	0.0%
Explosives	0	0.0%	0.0%	0.0%
Other Chemicals	86	0.1%	0.0%	0.1%

3.3 By Residence Type

Figure 3-2 summarizes the broad waste categories for the single- and multi-family substreams, while Tables 3-3 and 3-4 show the full detail.

As shown, the paper and organics categories represent the bulk of both the single- and multi-family waste streams (a total of 62.7% and 61.8%, respectively).

Figure 3-2 Composition Summary, by Residence Type
May 1994 - May 1995



Four components account for nearly half (49.8%) of the single-family substream:

- Food 23.8%
- Compostable/Soiled Paper 11.3%
- Mixed Low Grade Paper 9.7%
- OCC/Kraft Paper 5.0%

Table 3-3 Composition by Weight: Single-Family
May 1994 - May 1995

	Tons	Mean %	Low %	High %		Tons	Mean %	Low %	High %
PAPER	**27,805**	**32.8%**			**ORGANICS**	**25,341**	**29.9%**		
Newspaper	3,238	3.8%	3.5%	4.1%	Untreated Wood	1,123	1.3%	0.9%	1.7%
OCC/Kraft	4,279	5.0%	4.8%	5.3%	Crates/Pallets	54	0.1%	0.0%	0.1%
Office Paper	439	0.5%	0.4%	0.6%	Treated Wood	882	1.0%	0.7%	1.4%
Computer Paper	6	0.0%	0.0%	0.0%	Leaves and Grass	2,503	3.0%	2.1%	3.8%
Mixed Low Grade	8,243	9.7%	9.3%	10.1%	Prunings	581	0.7%	0.2%	1.2%
Phone Books	127	0.1%	0.1%	0.2%	Food	20,199	23.8%	22.8%	24.8%
Milk/Juice Polycoats	821	1.0%	0.9%	1.0%	**OTHER MATERIALS**	**15,860**	**18.7%**		
Frozen Food Polycoats	255	0.3%	0.3%	0.3%	Textiles	1,762	2.1%	1.8%	2.4%
Compostable/Soiled	9,555	11.3%	10.7%	11.9%	Carpet/Upholstery	1,257	1.5%	1.0%	1.9%
Paper/Other Materials	726	0.9%	0.8%	0.9%	Leather	55	0.1%	0.0%	0.1%
Other Paper	115	0.1%	0.1%	0.2%	Disposable Diapers	3,320	3.9%	3.6%	4.2%
PLASTIC	**8,340**	**9.8%**			Animal By-Products	3,028	3.6%	3.2%	4.0%
PET Pop & Liquor	277	0.3%	0.3%	0.4%	Rubber Products	223	0.3%	0.2%	0.3%
Other PET Bottles	63	0.1%	0.1%	0.1%	Tires	6	0.0%	0.0%	0.0%
HDPE Pop & Liquor	280	0.3%	0.3%	0.4%	Ash	72	0.1%	0.0%	0.1%
Other HDPE Bottles	298	0.4%	0.3%	0.4%	Furniture	127	0.2%	0.0%	0.3%
Other Plastic Bottles	366	0.4%	0.4%	0.5%	Mattresses	27	0.0%	0.0%	0.1%
Other Rigid Containers	464	0.5%	0.5%	0.6%	Small Appliances	381	0.4%	0.3%	0.6%
Expanded Polystyrene	507	0.6%	0.6%	0.6%	A/V Equipment	169	0.2%	0.1%	0.3%
Other Rigid Packaging	501	0.6%	0.6%	0.6%	Ceramics/Porcelain	206	0.2%	0.2%	0.3%
Grocery/Bread Bags	1,595	1.9%	1.7%	2.0%	Gypsum Drywall	649	0.8%	0.4%	1.1%
Other Film	2,742	3.2%	3.1%	3.4%	Fiberglass Insulation	39	0.0%	0.0%	0.1%
Plastic Products	823	1.0%	0.9%	1.1%	Rock/Concrete/Brick	516	0.6%	0.4%	0.8%
Plastic/Other Materials	423	0.5%	0.4%	0.6%	Construction Debris	606	0.7%	0.5%	1.0%
GLASS	**3,466**	**4.1%**			Sand/Soil/Dirt	806	1.0%	0.7%	1.3%
Clear Beverage	1,304	1.5%	1.4%	1.7%	Non-distinct Fines	1,834	2.2%	1.9%	2.4%
Green Beverage	689	0.8%	0.7%	0.9%	Misc. Organics	447	0.5%	0.4%	0.7%
Brown Beverage	528	0.6%	0.5%	0.7%	Misc. Inorganics	328	0.4%	0.3%	0.5%
Container Glass	716	0.8%	0.7%	0.9%	**HOUSEHOLD HAZARDOUS**	**369**	**0.4%**		
Other Glass	229	0.3%	0.2%	0.3%	Latex Paints	44	0.1%	0.0%	0.1%
METAL	**3,632**	**4.3%**			Adhesives/Glues	51	0.1%	0.0%	0.1%
Aluminum Cans	360	0.4%	0.4%	0.5%	Oil-based Paints/Solvents	27	0.0%	0.0%	0.1%
Alum. Foil/Containers	213	0.3%	0.2%	0.3%	Cleaners	13	0.0%	0.0%	0.0%
Other Aluminum	53	0.1%	0.0%	0.1%	Pesticides/Herbicides	20	0.0%	0.0%	0.1%
Tin Food Cans	1,227	1.4%	1.4%	1.5%	Dry-Cell Batteries	109	0.1%	0.1%	0.1%
Ferrous	768	0.9%	0.7%	1.1%	Wet-Cell Batteries	0	0.0%	0.0%	0.0%
Nonferrous	21	0.0%	0.0%	0.0%	Gasoline/Kerosene	0	0.0%	0.0%	0.0%
Mixed Metals/Materials	990	1.2%	1.0%	1.4%	Motor Oil/Diesel Oil	21	0.0%	0.0%	0.0%
					Asbestos	0	0.0%	0.0%	0.0%
					Explosives	0	0.0%	0.0%	0.0%
Total Tons	**84,814**	***Sample Count***		**297**	Other Chemicals	83	0.1%	0.1%	0.1%

As shown in Table 3-4, the five most prevalent components make up more than half (52.9%) of the multi-family substream:

- Food 15.5%
- Mixed Low Grade Paper 11.3%
- Newspaper 9.3%
- Compostable/Soiled Paper 9.3%
- OCC/Kraft Paper 7.5%

Table 3-4 Composition by Weight: Multi-Family
May 1994 - May 1995

	Tons	Mean %	Low %	High %		Tons	Mean %	Low %	High %
PAPER	**24,590**	**40.5%**			**ORGANICS**	**12,938**	**21.3%**		
Newspaper	5,640	9.3%	7.7%	10.8%	Untreated Wood	509	0.8%	0.5%	1.2%
OCC/Kraft	4,582	7.5%	6.4%	8.6%	Crates/Pallets	247	0.4%	0.0%	0.9%
Office Paper	429	0.7%	0.5%	0.9%	Treated Wood	722	1.2%	0.8%	1.6%
Computer Paper	18	0.0%	0.0%	0.1%	Leaves and Grass	1,415	2.3%	1.3%	3.3%
Mixed Low Grade	6,884	11.3%	9.9%	12.8%	Prunings	651	1.1%	0.3%	1.9%
Phone Books	222	0.4%	0.2%	0.6%	Food	9,394	15.5%	13.6%	17.3%
Milk/Juice Polycoats	413	0.7%	0.6%	0.8%	**OTHER MATERIALS**	**11,069**	**18.2%**		
Frozen Food Polycoats	158	0.3%	0.2%	0.3%	Textiles	1,198	2.0%	1.6%	2.4%
Compostable/Soiled	5,664	9.3%	8.0%	10.6%	Carpet/Upholstery	2,016	3.3%	1.9%	4.7%
Paper/Other Materials	506	0.8%	0.6%	1.1%	Leather	9	0.0%	0.0%	0.0%
Other Paper	75	0.1%	0.0%	0.2%	Disposable Diapers	1,480	2.4%	1.8%	3.0%
PLASTIC	**4,968**	**8.2%**			Animal By-Products	1,489	2.4%	1.7%	3.2%
PET Pop & Liquor	263	0.4%	0.4%	0.5%	Rubber Products	162	0.3%	0.1%	0.4%
Other PET Bottles	40	0.1%	0.0%	0.1%	Tires	48	0.1%	0.0%	0.2%
HDPE Pop & Liquor	207	0.3%	0.3%	0.4%	Ash	0	0.0%	0.0%	0.0%
Other HDPE Bottles	126	0.2%	0.2%	0.3%	Furniture	284	0.5%	0.0%	0.9%
Other Plastic Bottles	175	0.3%	0.2%	0.3%	Mattresses	58	0.1%	0.0%	0.2%
Other Rigid Containers	228	0.4%	0.3%	0.4%	Small Appliances	345	0.6%	0.0%	1.1%
Expanded Polystyrene	251	0.4%	0.3%	0.5%	A/V Equipment	59	0.1%	0.0%	0.2%
Other Rigid Packaging	267	0.4%	0.4%	0.5%	Ceramics/Porcelain	160	0.3%	0.1%	0.4%
Grocery/Bread Bags	989	1.6%	1.4%	1.9%	Gypsum Drywall	864	1.4%	0.4%	2.4%
Other Film	1,498	2.5%	2.2%	2.7%	Fiberglass Insulation	0	0.0%	0.0%	0.0%
Plastic Products	587	1.0%	0.7%	1.2%	Rock/Concrete/Brick	163	0.3%	0.0%	0.5%
Plastic/Other Materials	339	0.6%	0.3%	0.8%	Construction Debris	204	0.3%	0.1%	0.6%
GLASS	**3,177**	**5.2%**			Sand/Soil/Dirt	765	1.3%	0.7%	1.8%
Clear Beverage	1,071	1.8%	1.5%	2.1%	Non-distinct Fines	1,528	2.5%	1.9%	3.1%
Green Beverage	760	1.3%	1.0%	1.5%	Misc. Organics	92	0.2%	0.1%	0.2%
Brown Beverage	623	1.0%	0.8%	1.3%	Misc. Inorganics	146	0.2%	0.1%	0.4%
Container Glass	498	0.8%	0.6%	1.0%	**HOUSEHOLD HAZARDOUS**	**299**	**0.5%**		
Other Glass	225	0.4%	0.2%	0.5%	Latex Paints	92	0.2%	0.0%	0.3%
METAL	**3,737**	**6.1%**			Adhesives/Glues	30	0.0%	0.0%	0.1%
Aluminum Cans	401	0.7%	0.5%	0.8%	Oil-based Paints/Solvents	3	0.0%	0.0%	0.0%
Alum. Foil/Containers	116	0.2%	0.2%	0.2%	Cleaners	2	0.0%	0.0%	0.0%
Other Aluminum	26	0.0%	0.0%	0.1%	Pesticides/Herbicides	7	0.0%	0.0%	0.0%
Tin Food Cans	926	1.5%	1.3%	1.7%	Dry-Cell Batteries	155	0.3%	0.0%	0.5%
Ferrous	1,225	2.0%	1.1%	3.0%	Wet-Cell Batteries	0	0.0%	0.0%	0.0%
Nonferrous	20	0.0%	0.0%	0.1%	Gasoline/Kerosene	0	0.0%	0.0%	0.0%
Mixed Metals/Materials	1,023	1.7%	0.9%	2.5%	Motor Oil/Diesel Oil	4	0.0%	0.0%	0.0%
					Asbestos	0	0.0%	0.0%	0.0%
					Explosives	0	0.0%	0.0%	0.0%
Total Tons	**60,777**	***Sample Count***		**71**	Other Chemicals	6	0.0%	0.0%	0.0%

Eleven waste category groups (listed in Table 3-2, above) were compared across residence type. As shown in Table 3-5, there are greater percentages of non-curbside plastic and food in the single-family substream and more newspaper, OCC/Kraft, curbside glass and aluminum in the multi-family waste. (These figures measure disposed waste only, and do not include tonnage collected through recycling programs.) Variations in the relative amount of curbside paper, curbside plastic, tin, yard debris and household hazardous materials were not statistically significant. Please see Appendix E for a detailed description of how these calculations were performed.

Table 3-5 Statistically Significant Differences, by Residence Type
May 1994 - May 1995

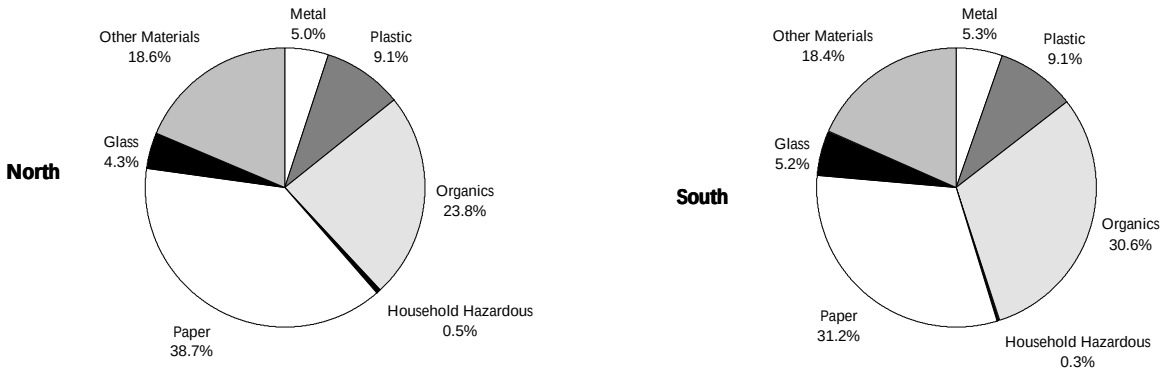
	Mean Composition	
	Single-Family	*Multi-Family*
Newspaper	3.8%	8.9%
OCC/Kraft	5.2%	7.7%
Non-Curbside Plastic	8.8%	7.2%
Curbside Glass	3.4%	4.4%
Aluminum	0.7%	0.9%
Food	23.8%	15.9%

3.4 By Service Area

Figure 3-3 summarizes the broad waste categories for the north and south service areas; detailed results for each region are presented in Tables 3-6 and 3-7.

Paper and organics are prevalent in both the north (a total of 62.5%) and south (a total of 61.8%).

Figure 3-3 Composition Summary, by Service Area
May 1994 - May 1995



Combined, the following six components account for the majority (54.3%) of the north's waste:

- Food 18.9%
- Mixed Low Grade Paper 11.4%
- Compostable/Soiled Paper 10.5%
- Newspaper 7.1%
- OCC/Kraft Paper 6.4%

Table 3-6 Composition by Weight: North Service Area
May 1994 - May 1995

	Tons	Mean %	Low %	High %		Tons	Mean %	Low %	High %
PAPER	**37,167**	**38.7%**			**ORGANICS**	**22,916**	**23.8%**		
Newspaper	6,828	7.1%	5.7%	8.5%	Untreated Wood	907	0.9%	0.7%	1.2%
OCC/Kraft	6,198	6.4%	5.5%	7.4%	Crates/Pallets	285	0.3%	0.0%	0.6%
Office Paper	662	0.7%	0.5%	0.9%	Treated Wood	1,056	1.1%	0.8%	1.4%
Computer Paper	21	0.0%	0.0%	0.0%	Leaves and Grass	1,779	1.9%	1.3%	2.4%
Mixed Low Grade	10,976	11.4%	10.1%	12.8%	Prunings	700	0.7%	0.2%	1.2%
Phone Books	251	0.3%	0.1%	0.4%	Food	18,187	18.9%	17.3%	20.5%
Milk/Juice Polycoats	856	0.9%	0.8%	1.0%	**OTHER MATERIALS**	**17,834**	**18.6%**		
Frozen Food Polycoats	277	0.3%	0.2%	0.3%	Textiles	1,788	1.9%	1.5%	2.2%
Compostable/Soiled	10,055	10.5%	9.3%	11.6%	Carpet/Upholstery	2,089	2.2%	1.3%	3.1%
Paper/Other Materials	886	0.9%	0.7%	1.1%	Leather	47	0.0%	0.0%	0.1%
Other Paper	155	0.2%	0.1%	0.2%	Disposable Diapers	2,636	2.7%	2.3%	3.2%
PLASTIC	**8,770**	**9.1%**			Animal By-Products	3,169	3.3%	2.7%	3.8%
PET Pop & Liquor	371	0.4%	0.3%	0.4%	Rubber Products	225	0.2%	0.2%	0.3%
Other PET Bottles	67	0.1%	0.1%	0.1%	Tires	56	0.1%	0.0%	0.1%
HDPE Pop & Liquor	336	0.3%	0.3%	0.4%	Ash	50	0.1%	0.0%	0.1%
Other HDPE Bottles	265	0.3%	0.2%	0.3%	Furniture	258	0.3%	0.1%	0.5%
Other Plastic Bottles	360	0.4%	0.3%	0.4%	Mattresses	82	0.1%	0.0%	0.2%
Other Rigid Containers	478	0.5%	0.4%	0.6%	Small Appliances	583	0.6%	0.2%	1.0%
Expanded Polystyrene	460	0.5%	0.4%	0.5%	A/V Equipment	127	0.1%	0.0%	0.2%
Other Rigid Packaging	535	0.6%	0.5%	0.6%	Ceramics/Porcelain	206	0.2%	0.1%	0.3%
Grocery/Bread Bags	1,687	1.8%	1.5%	2.0%	Gypsum Drywall	1,295	1.3%	0.6%	2.1%
Other Film	2,748	2.9%	2.6%	3.1%	Fiberglass Insulation	22	0.0%	0.0%	0.0%
Plastic Products	916	1.0%	0.8%	1.1%	Rock/Concrete/Brick	430	0.4%	0.3%	0.6%
Plastic/Other Materials	547	0.6%	0.4%	0.7%	Construction Debris	474	0.5%	0.3%	0.7%
GLASS	**4,129**	**4.3%**			Sand/Soil/Dirt	1,116	1.2%	0.8%	1.6%
Clear Beverage	1,344	1.4%	1.2%	1.6%	Non-distinct Fines	2,547	2.6%	2.2%	3.1%
Green Beverage	958	1.0%	0.8%	1.2%	Misc. Organics	318	0.3%	0.3%	0.4%
Brown Beverage	779	0.8%	0.6%	1.0%	Misc. Inorganics	319	0.3%	0.2%	0.4%
Container Glass	723	0.8%	0.6%	0.9%	**HOUSEHOLD HAZARDOUS**	**498**	**0.5%**		
Other Glass	326	0.3%	0.2%	0.5%	Latex Paints	126	0.1%	0.0%	0.3%
METAL	**4,824**	**5.0%**			Adhesives/Glues	52	0.1%	0.0%	0.1%
Aluminum Cans	502	0.5%	0.4%	0.6%	Oil-based Paints/Solvents	16	0.0%	0.0%	0.0%
Alum. Foil/Containers	207	0.2%	0.2%	0.2%	Cleaners	9	0.0%	0.0%	0.0%
Other Aluminum	61	0.1%	0.0%	0.1%	Pesticides/Herbicides	27	0.0%	0.0%	0.0%
Tin Food Cans	1,363	1.4%	1.2%	1.6%	Dry-Cell Batteries	217	0.2%	0.1%	0.4%
Ferrous	1,622	1.7%	1.0%	2.3%	Wet-Cell Batteries	0	0.0%	0.0%	0.0%
Nonferrous	29	0.0%	0.0%	0.1%	Gasoline/Kerosene	0	0.0%	0.0%	0.0%
Mixed Metals/Materials	1,039	1.1%	0.8%	1.4%	Motor Oil/Diesel Oil	4	0.0%	0.0%	0.0%
					Asbestos	0	0.0%	0.0%	0.0%
					Explosives	0	0.0%	0.0%	0.0%
Total Tons	**96,139**	***Sample Count***		**244**	Other Chemicals	47	0.0%	0.0%	0.1%

Four components in the south service area account for 46.7% of the substream's total waste:

- Food 22.5%
- Compostable/Soiled Paper 10.3%
- Mixed Low Grade Paper 8.4%
- OCC/Kraft Paper 5.5%

Table 3-7 Composition by Weight: South Service Area
May 1994 - May 1995

	Tons	Mean %	Low %	High %		Tons	Mean %	Low %	High %
PAPER	**15,422**	**31.2%**			**ORGANICS**	**15,128**	**30.6%**		
Newspaper	2,217	4.5%	3.9%	5.1%	Untreated Wood	712	1.4%	0.8%	2.0%
OCC/Kraft	2,742	5.5%	4.8%	6.3%	Crates/Pallets	24	0.0%	0.0%	0.1%
Office Paper	210	0.4%	0.3%	0.5%	Treated Wood	553	1.1%	0.6%	1.6%
Computer Paper	4	0.0%	0.0%	0.0%	Leaves and Grass	2,143	4.3%	2.8%	5.9%
Mixed Low Grade	4,178	8.4%	7.9%	9.0%	Prunings	549	1.1%	0.3%	1.9%
Phone Books	104	0.2%	0.1%	0.3%	Food	11,146	22.5%	21.1%	24.0%
Milk/Juice Polycoats	366	0.7%	0.7%	0.8%	**OTHER MATERIALS**	**9,075**	**18.4%**		
Frozen Food Polycoats	134	0.3%	0.2%	0.3%	Textiles	1,174	2.4%	1.9%	2.8%
Compostable/Soiled	5,093	10.3%	9.6%	11.0%	Carpet/Upholstery	1,254	2.5%	1.4%	3.7%
Paper/Other Materials	342	0.7%	0.6%	0.8%	Leather	14	0.0%	0.0%	0.0%
Other Paper	34	0.1%	0.0%	0.1%	Disposable Diapers	2,128	4.3%	3.8%	4.8%
PLASTIC	**4,478**	**9.1%**			Animal By-Products	1,302	2.6%	2.1%	3.2%
PET Pop & Liquor	173	0.3%	0.3%	0.4%	Rubber Products	161	0.3%	0.2%	0.5%
Other PET Bottles	35	0.1%	0.1%	0.1%	Tires	0	0.0%	0.0%	0.0%
HDPE Pop & Liquor	151	0.3%	0.3%	0.3%	Ash	18	0.0%	0.0%	0.1%
Other HDPE Bottles	155	0.3%	0.3%	0.4%	Furniture	166	0.3%	0.0%	0.8%
Other Plastic Bottles	176	0.4%	0.3%	0.4%	Mattresses	5	0.0%	0.0%	0.0%
Other Rigid Containers	207	0.4%	0.4%	0.5%	Small Appliances	145	0.3%	0.2%	0.4%
Expanded Polystyrene	292	0.6%	0.5%	0.7%	A/V Equipment	98	0.2%	0.1%	0.3%
Other Rigid Packaging	226	0.5%	0.4%	0.5%	Ceramics/Porcelain	163	0.3%	0.2%	0.5%
Grocery/Bread Bags	889	1.8%	1.6%	2.0%	Gypsum Drywall	232	0.5%	0.2%	0.7%
Other Film	1,465	3.0%	2.7%	3.2%	Fiberglass Insulation	16	0.0%	0.0%	0.1%
Plastic Products	493	1.0%	0.8%	1.2%	Rock/Concrete/Brick	238	0.5%	0.1%	0.8%
Plastic/Other Materials	216	0.4%	0.3%	0.5%	Construction Debris	325	0.7%	0.3%	1.0%
GLASS	**2,564**	**5.2%**			Sand/Soil/Dirt	463	0.9%	0.5%	1.4%
Clear Beverage	1,046	2.1%	1.9%	2.4%	Non-distinct Fines	818	1.7%	1.3%	2.0%
Green Beverage	507	1.0%	0.8%	1.2%	Misc. Organics	208	0.4%	0.2%	0.6%
Brown Beverage	387	0.8%	0.6%	0.9%	Misc. Inorganics	150	0.3%	0.2%	0.4%
Container Glass	493	1.0%	0.9%	1.1%	**HOUSEHOLD HAZARDOUS**	**170**	**0.3%**		
Other Glass	132	0.3%	0.2%	0.4%	Latex Paints	12	0.0%	0.0%	0.0%
METAL	**2,614**	**5.3%**			Adhesives/Glues	28	0.1%	0.0%	0.1%
Aluminum Cans	268	0.5%	0.5%	0.6%	Oil-based Paints/Solvents	14	0.0%	0.0%	0.1%
Alum. Foil/Containers	120	0.2%	0.2%	0.3%	Cleaners	5	0.0%	0.0%	0.0%
Other Aluminum	18	0.0%	0.0%	0.1%	Pesticides/Herbicides	0	0.0%	0.0%	0.0%
Tin Food Cans	795	1.6%	1.5%	1.7%	Dry-Cell Batteries	51	0.1%	0.1%	0.1%
Ferrous	400	0.8%	0.6%	1.0%	Wet-Cell Batteries	0	0.0%	0.0%	0.0%
Nonferrous	12	0.0%	0.0%	0.0%	Gasoline/Kerosene	0	0.0%	0.0%	0.0%
Mixed Metals/Materials	1,002	2.0%	1.1%	3.0%	Motor Oil/Diesel Oil	21	0.0%	0.0%	0.1%
					Asbestos	0	0.0%	0.0%	0.0%
					Explosives	0	0.0%	0.0%	0.0%
Total Tons	**49,452**	***Sample Count***		**124**	Other Chemicals	39	0.1%	0.0%	0.1%

Eleven waste category groups (listed in Table 3-2, above) were compared across the two service areas. As shown in Table 3-8, there is more curbside paper in the north than the south, while there are greater proportions of curbside glass, tin and yard debris in the south. (These figures measure disposed waste only, and do not include tonnage collected through recycling programs.) Variations in the relative amount of newspaper, OCC/Kraft, curbside plastic, non-curbside plastic, aluminum, food and household hazardous materials were not statistically significant. Please see Appendix E for a detailed description of how these calculations were performed.

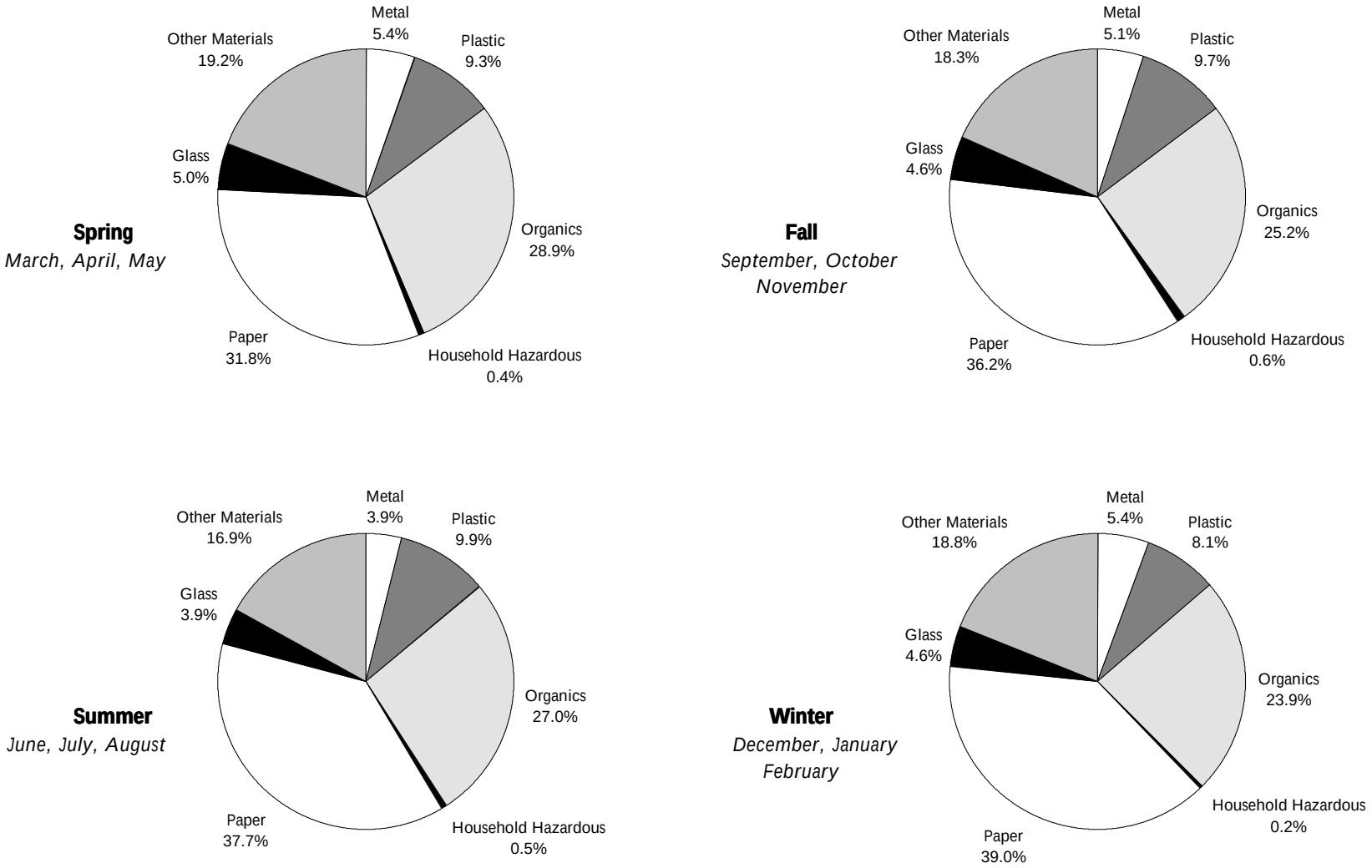
Table 3-8 Statistically Significant Differences, by Service Area
May 1994 - May 1995

	Mean Composition	
	North	*South*
Curbside Paper	11.8%	9.1%
Curbside Glass	3.2%	4.3%
Tin	1.3%	1.6%
Yard Debris	2.3%	5.5%

3.5 By Season

The waste composition remained quite stable throughout the sampling period, as shown in the seasonal summary at Figure 3-4.

Figure 3-4 Composition Summary, by Season
May 1994 - May 1995



As shown in Table 3-9, the four most prevalent materials in the disposed waste stream during the spring (March, April and May) are:

- Food 22.7%
- Compostable/Soiled Paper 10.2%
- Mixed Low Grade Paper 8.4%
- OCC/Kraft Paper 6.0%

Table 3-9 Composition by Weight: Spring
May 1994 and March, April & May 1995

	Mean %	Low %	High %		Mean %	Low %	High %
PAPER	**31.8%**			**ORGANICS**	**28.9%**		
Newspaper	4.6%	3.7%	5.5%	Untreated Wood	1.3%	0.5%	2.2%
OCC/Kraft	6.0%	4.8%	7.1%	Crates/Pallets	0.0%	0.0%	0.1%
Office Paper	0.5%	0.3%	0.6%	Treated Wood	0.6%	0.2%	0.9%
Computer Paper	0.0%	0.0%	0.0%	Leaves and Grass	3.7%	1.6%	5.8%
Mixed Low Grade	8.4%	7.5%	9.3%	Prunings	0.6%	0.1%	1.1%
Phone Books	0.2%	0.0%	0.4%	Food	22.7%	20.3%	25.0%
Milk/Juice Polycoats	0.9%	0.8%	1.0%	**OTHER MATERIALS**	**19.2%**		
Frozen Food Polycoats	0.3%	0.2%	0.4%	Textiles	2.1%	1.7%	2.4%
Compostable/Soiled	10.2%	9.2%	11.2%	Carpet/Upholstery	2.7%	0.9%	4.5%
Paper/Other Materials	0.8%	0.6%	1.0%	Leather	0.0%	0.0%	0.1%
Other Paper	0.0%	0.0%	0.1%	Disposable Diapers	4.0%	3.3%	4.7%
PLASTIC	**9.3%**			Animal By-Products	3.2%	2.4%	4.0%
PET Pop & Liquor	0.3%	0.3%	0.4%	Rubber Products	0.3%	0.1%	0.6%
Other PET Bottles	0.1%	0.0%	0.1%	Tires	0.0%	0.0%	0.0%
HDPE Pop & Liquor	0.3%	0.2%	0.3%	Ash	0.0%	0.0%	0.1%
Other HDPE Bottles	0.3%	0.3%	0.4%	Furniture	0.4%	0.0%	1.1%
Other Plastic Bottles	0.4%	0.3%	0.4%	Mattresses	0.0%	0.0%	0.0%
Other Rigid Containers	0.5%	0.4%	0.6%	Small Appliances	0.3%	0.1%	0.5%
Expanded Polystyrene	0.6%	0.5%	0.7%	A/V Equipment	0.2%	0.0%	0.4%
Other Rigid Packaging	0.5%	0.4%	0.6%	Ceramics/Porcelain	0.4%	0.1%	0.7%
Grocery/Bread Bags	1.8%	1.5%	2.0%	Gypsum Drywall	0.5%	0.2%	0.9%
Other Film	3.1%	2.7%	3.4%	Fiberglass Insulation	0.0%	0.0%	0.1%
Plastic Products	1.1%	0.8%	1.3%	Rock/Concrete/Brick	0.5%	0.0%	1.0%
Plastic/Other Materials	0.5%	0.3%	0.6%	Construction Debris	0.7%	0.3%	1.2%
GLASS	**5.0%**			Sand/Soil/Dirt	1.1%	0.4%	1.8%
Clear Beverage	1.8%	1.5%	2.2%	Non-distinct Fines	2.0%	1.5%	2.6%
Green Beverage	1.1%	0.8%	1.4%	Misc. Organics	0.3%	0.2%	0.5%
Brown Beverage	0.8%	0.6%	1.1%	Misc. Inorganics	0.3%	0.2%	0.5%
Container Glass	0.9%	0.8%	1.1%	**HOUSEHOLD HAZARDOUS**	**0.4%**		
Other Glass	0.3%	0.2%	0.4%	Latex Paints	0.0%	0.0%	0.0%
METAL	**5.4%**			Adhesives/Glues	0.1%	0.0%	0.2%
Aluminum Cans	0.5%	0.4%	0.6%	Oil-based Paints/Solvents	0.0%	0.0%	0.1%
Alum. Foil/Containers	0.3%	0.2%	0.3%	Cleaners	0.0%	0.0%	0.0%
Other Aluminum	0.0%	0.0%	0.1%	Pesticides/Herbicides	0.0%	0.0%	0.0%
Tin Food Cans	1.6%	1.4%	1.8%	Dry-Cell Batteries	0.1%	0.1%	0.2%
Ferrous	0.8%	0.5%	1.1%	Wet-Cell Batteries	0.0%	0.0%	0.0%
Nonferrous	0.0%	0.0%	0.0%	Gasoline/Kerosene	0.0%	0.0%	0.0%
Mixed Metals/Materials	2.2%	0.7%	3.7%	Motor Oil/Diesel Oil	0.0%	0.0%	0.1%
				Asbestos	0.0%	0.0%	0.0%
				Explosives	0.0%	0.0%	0.0%
	Sample Count		**170**	Other Chemicals	0.1%	0.0%	0.2%

As shown in Table 3-10, four materials account for a combined total of 52.6% of the summer's (June, July and August) waste:

- Food 22.6%
- Compostable/Soiled Paper 13.2%
- Mixed Low Grade Paper 11.3%
- OCC/Kraft Paper 5.5%

Table 3-10 Composition by Weight: Summer
June, July and August 1994

	Mean %	Low %	High %		Mean %	Low %	High %
PAPER	**37.7%**			**ORGANICS**	**27.0%**		
Newspaper	4.3%	3.8%	4.8%	Untreated Wood	1.2%	0.7%	1.7%
OCC/Kraft	5.5%	5.0%	6.1%	Crates/Pallets	0.0%	0.0%	0.1%
Office Paper	0.7%	0.5%	0.9%	Treated Wood	1.0%	0.6%	1.5%
Computer Paper	0.0%	0.0%	0.0%	Leaves and Grass	1.9%	1.3%	2.6%
Mixed Low Grade	11.3%	10.5%	12.0%	Prunings	0.2%	0.1%	0.3%
Phone Books	0.1%	0.0%	0.2%	Food	22.6%	21.3%	24.0%
Milk/Juice Polycoats	1.1%	1.0%	1.2%	**OTHER MATERIALS**	**16.9%**		
Frozen Food Polycoats	0.3%	0.3%	0.4%	Textiles	1.8%	1.6%	2.0%
Compostable/Soiled	13.2%	12.1%	14.4%	Carpet/Upholstery	1.3%	0.7%	1.8%
Paper/Other Materials	1.0%	0.9%	1.1%	Leather	0.0%	0.0%	0.1%
Other Paper	0.2%	0.1%	0.2%	Disposable Diapers	3.0%	2.6%	3.4%
PLASTIC	**9.9%**			Animal By-Products	3.1%	2.5%	3.6%
PET Pop & Liquor	0.4%	0.3%	0.4%	Rubber Products	0.2%	0.0%	0.4%
Other PET Bottles	0.1%	0.1%	0.1%	Tires	0.0%	0.0%	0.0%
HDPE Pop & Liquor	0.4%	0.3%	0.4%	Ash	0.2%	0.0%	0.3%
Other HDPE Bottles	0.4%	0.3%	0.4%	Furniture	0.4%	0.0%	0.8%
Other Plastic Bottles	0.4%	0.3%	0.4%	Mattresses	0.1%	0.0%	0.1%
Other Rigid Containers	0.6%	0.5%	0.6%	Small Appliances	0.3%	0.1%	0.4%
Expanded Polystyrene	0.6%	0.6%	0.7%	A/V Equipment	0.1%	0.0%	0.2%
Other Rigid Packaging	0.7%	0.6%	0.8%	Ceramics/Porcelain	0.2%	0.1%	0.3%
Grocery/Bread Bags	1.8%	1.6%	2.0%	Gypsum Drywall	0.7%	0.4%	1.0%
Other Film	3.2%	3.0%	3.4%	Fiberglass Insulation	0.1%	0.0%	0.1%
Plastic Products	0.7%	0.6%	0.9%	Rock/Concrete/Brick	0.5%	0.3%	0.8%
Plastic/Other Materials	0.6%	0.4%	0.8%	Construction Debris	0.4%	0.2%	0.5%
GLASS	**3.9%**			Sand/Soil/Dirt	1.2%	0.7%	1.7%
Clear Beverage	1.3%	1.0%	1.5%	Non-distinct Fines	2.3%	1.9%	2.8%
Green Beverage	0.9%	0.7%	1.1%	Misc. Organics	0.8%	0.5%	1.0%
Brown Beverage	0.6%	0.5%	0.8%	Misc. Inorganics	0.4%	0.2%	0.6%
Container Glass	0.8%	0.7%	1.0%	**HOUSEHOLD HAZARDOUS**	**0.5%**		
Other Glass	0.3%	0.2%	0.4%	Latex Paints	0.1%	0.0%	0.2%
METAL	**3.9%**			Adhesives/Glues	0.1%	0.0%	0.2%
Aluminum Cans	0.4%	0.4%	0.5%	Oil-based Paints/Solvents	0.0%	0.0%	0.0%
Alum. Foil/Containers	0.2%	0.2%	0.3%	Cleaners	0.0%	0.0%	0.0%
Other Aluminum	0.0%	0.0%	0.1%	Pesticides/Herbicides	0.0%	0.0%	0.0%
Tin Food Cans	1.4%	1.3%	1.5%	Dry-Cell Batteries	0.2%	0.1%	0.2%
Ferrous	0.8%	0.6%	1.0%	Wet-Cell Batteries	0.0%	0.0%	0.0%
Nonferrous	0.0%	0.0%	0.1%	Gasoline/Kerosene	0.0%	0.0%	0.0%
Mixed Metals/Materials	1.0%	0.8%	1.2%	Motor Oil/Diesel Oil	0.0%	0.0%	0.0%
				Asbestos	0.0%	0.0%	0.0%
				Explosives	0.0%	0.0%	0.0%
	Sample Count		**96**	Other Chemicals	0.1%	0.0%	0.2%

As shown in Table 3-11, the most prevalent components in the disposed waste stream during the fall (September, October and November) are:

- Food 20.0%
- Mixed Low Grade Paper 10.7%
- Compostable/Soiled Paper 9.8%
- Newspaper 6.9%
- OCC/Kraft Paper 6.0%

Table 3-11 Composition by Weight: Fall
September, October and November 1994

	Mean %	Low %	High %		Mean %	Low %	High %
PAPER	**36.2%**			**ORGANICS**	**25.2%**		
Newspaper	6.9%	4.2%	9.5%	Untreated Wood	0.7%	0.4%	1.0%
OCC/Kraft	6.0%	4.5%	7.5%	Crates/Pallets	0.6%	0.0%	1.4%
Office Paper	0.7%	0.4%	0.9%	Treated Wood	1.1%	0.6%	1.5%
Computer Paper	0.0%	0.0%	0.0%	Leaves and Grass	2.2%	1.2%	3.2%
Mixed Low Grade	10.7%	8.5%	12.8%	Prunings	0.7%	0.2%	1.2%
Phone Books	0.3%	0.1%	0.5%	Food	20.0%	17.1%	23.0%
Milk/Juice Polycoats	0.7%	0.6%	0.8%	**OTHER MATERIALS**	**18.3%**		
Frozen Food Polycoats	0.3%	0.2%	0.3%	Textiles	1.9%	1.4%	2.4%
Compostable/Soiled	9.8%	7.6%	12.1%	Carpet/Upholstery	1.2%	0.8%	1.6%
Paper/Other Materials	0.7%	0.5%	0.8%	Leather	0.1%	0.0%	0.1%
Other Paper	0.2%	0.1%	0.3%	Disposable Diapers	2.9%	2.1%	3.6%
PLASTIC	**9.7%**			Animal By-Products	3.4%	2.6%	4.3%
PET Pop & Liquor	0.4%	0.3%	0.6%	Rubber Products	0.2%	0.1%	0.3%
Other PET Bottles	0.1%	0.0%	0.1%	Tires	0.2%	0.0%	0.0%
HDPE Pop & Liquor	0.3%	0.3%	0.4%	Ash	0.0%	0.0%	0.1%
Other HDPE Bottles	0.3%	0.2%	0.4%	Furniture	0.1%	0.0%	0.2%
Other Plastic Bottles	0.4%	0.4%	0.5%	Mattresses	0.1%	0.0%	0.2%
Other Rigid Containers	0.5%	0.4%	0.6%	Small Appliances	0.8%	0.3%	1.4%
Expanded Polystyrene	0.5%	0.4%	0.6%	A/V Equipment	0.3%	0.0%	0.5%
Other Rigid Packaging	0.5%	0.4%	0.6%	Ceramics/Porcelain	0.1%	0.1%	0.2%
Grocery/Bread Bags	1.9%	1.4%	2.4%	Gypsum Drywall	1.6%	0.3%	3.0%
Other Film	3.1%	2.7%	3.5%	Fiberglass Insulation	0.0%	0.0%	0.0%
Plastic Products	1.0%	0.7%	1.3%	Rock/Concrete/Brick	0.4%	0.2%	0.6%
Plastic/Other Materials	0.6%	0.2%	0.9%	Construction Debris	0.7%	0.3%	1.1%
GLASS	**4.6%**			Sand/Soil/Dirt	1.1%	0.3%	1.9%
Clear Beverage	1.4%	1.0%	1.9%	Non-distinct Fines	2.8%	2.0%	3.6%
Green Beverage	1.0%	0.6%	1.3%	Misc. Organics	0.2%	0.1%	0.3%
Brown Beverage	0.9%	0.5%	1.3%	Misc. Inorganics	0.2%	0.1%	0.3%
Container Glass	0.9%	0.5%	1.3%	**HOUSEHOLD HAZARDOUS**	**0.6%**		
Other Glass	0.4%	0.1%	0.6%	Latex Paints	0.3%	0.0%	0.6%
METAL	**5.1%**			Adhesives/Glues	0.0%	0.0%	0.1%
Aluminum Cans	0.6%	0.4%	0.9%	Oil-based Paints/Solvents	0.0%	0.0%	0.1%
Alum. Foil/Containers	0.2%	0.1%	0.2%	Cleaners	0.0%	0.0%	0.0%
Other Aluminum	0.1%	0.0%	0.2%	Pesticides/Herbicides	0.1%	0.0%	0.0%
Tin Food Cans	1.3%	1.0%	1.6%	Dry-Cell Batteries	0.4%	0.0%	0.8%
Ferrous	2.0%	0.8%	3.2%	Wet-Cell Batteries	0.0%	0.0%	0.0%
Nonferrous	0.1%	0.0%	0.1%	Gasoline/Kerosene	0.0%	0.0%	0.0%
Mixed Metals/Materials	0.9%	0.6%	1.1%	Motor Oil/Diesel Oil	0.0%	0.0%	0.0%
				Asbestos	0.0%	0.0%	0.0%
				Explosives	0.0%	0.0%	0.0%
	Sample Count		**92**	Other Chemicals	0.1%	0.0%	0.1%

Table 3-12 displays the results of the winter (December, January and February) sampling. Five materials, accounting for 52.8% of the season's waste, are listed below:

- Food 16.9%
- Mixed Low Grade Paper 11.5%
- Compostable/Soiled Paper 9.7%
- Newspaper 8.0%
- OCC/Kraft Paper 6.7%

Table 3-12 Composition by Weight: Winter
December 1994 and January & February 1995

	Mean %	Low %	High %		Mean %	Low %	High %
PAPER	**39.0%**			**ORGANICS**	**23.9%**		
Newspaper	8.0%	6.3%	9.8%	Untreated Wood	1.2%	0.8%	1.6%
OCC/Kraft	6.7%	5.2%	8.1%	Crates/Pallets	0.2%	0.0%	0.4%
Office Paper	0.6%	0.3%	0.8%	Treated Wood	1.6%	0.9%	2.3%
Computer Paper	0.0%	0.0%	0.1%	Leaves and Grass	2.6%	1.5%	3.6%
Mixed Low Grade	11.5%	9.5%	13.4%	Prunings	1.5%	0.3%	2.7%
Phone Books	0.3%	0.1%	0.6%	Food	16.9%	15.0%	18.8%
Milk/Juice Polycoats	0.8%	0.6%	0.9%	**OTHER MATERIALS**	**18.8%**		
Frozen Food Polycoats	0.3%	0.2%	0.3%	Textiles	2.2%	1.6%	2.8%
Compostable/Soiled	9.7%	8.3%	11.0%	Carpet/Upholstery	3.2%	1.5%	5.0%
Paper/Other Materials	1.0%	0.6%	1.3%	Leather	0.0%	0.0%	0.0%
Other Paper	0.2%	0.0%	0.3%	Disposable Diapers	3.1%	2.5%	3.7%
PLASTIC	**8.1%**			Animal By-Products	2.7%	1.9%	3.6%
PET Pop & Liquor	0.4%	0.3%	0.4%	Rubber Products	0.3%	0.1%	0.4%
Other PET Bottles	0.1%	0.0%	0.1%	Tires	0.0%	0.0%	0.0%
HDPE Pop & Liquor	0.3%	0.3%	0.4%	Ash	0.0%	0.0%	0.0%
Other HDPE Bottles	0.2%	0.2%	0.3%	Furniture	0.3%	0.0%	0.7%
Other Plastic Bottles	0.3%	0.3%	0.4%	Mattresses	0.1%	0.0%	0.2%
Other Rigid Containers	0.4%	0.3%	0.5%	Small Appliances	0.5%	0.0%	1.2%
Expanded Polystyrene	0.4%	0.3%	0.4%	A/V Equipment	0.1%	0.0%	0.1%
Other Rigid Packaging	0.5%	0.4%	0.5%	Ceramics/Porcelain	0.2%	0.1%	0.4%
Grocery/Bread Bags	1.6%	1.5%	1.8%	Gypsum Drywall	1.3%	0.1%	2.4%
Other Film	2.5%	2.2%	2.8%	Fiberglass Insulation	0.0%	0.0%	0.0%
Plastic Products	1.0%	0.7%	1.2%	Rock/Concrete/Brick	0.4%	0.1%	0.7%
Plastic/Other Materials	0.5%	0.3%	0.6%	Construction Debris	0.4%	0.1%	0.7%
GLASS	**4.6%**			Sand/Soil/Dirt	1.0%	0.5%	1.6%
Clear Beverage	1.8%	1.5%	2.1%	Non-distinct Fines	2.2%	1.5%	2.9%
Green Beverage	1.0%	0.7%	1.3%	Misc. Organics	0.3%	0.1%	0.4%
Brown Beverage	0.8%	0.6%	1.0%	Misc. Inorganics	0.3%	0.1%	0.6%
Container Glass	0.7%	0.5%	0.9%	**HOUSEHOLD HAZARDOUS**	**0.2%**		
Other Glass	0.3%	0.1%	0.4%	Latex Paints	0.0%	0.0%	0.0%
METAL	**5.4%**			Adhesives/Glues	0.0%	0.0%	0.0%
Aluminum Cans	0.5%	0.4%	0.6%	Oil-based Paints/Solvents	0.0%	0.0%	0.0%
Alum. Foil/Containers	0.2%	0.2%	0.3%	Cleaners	0.0%	0.0%	0.0%
Other Aluminum	0.0%	0.0%	0.0%	Pesticides/Herbicides	0.0%	0.0%	0.0%
Tin Food Cans	1.6%	1.4%	1.8%	Dry-Cell Batteries	0.1%	0.1%	0.1%
Ferrous	1.7%	0.8%	2.7%	Wet-Cell Batteries	0.0%	0.0%	0.0%
Nonferrous	0.0%	0.0%	0.0%	Gasoline/Kerosene	0.0%	0.0%	0.0%
Mixed Metals/Materials	1.3%	0.8%	1.9%	Motor Oil/Diesel Oil	0.0%	0.0%	0.0%
				Asbestos	0.0%	0.0%	0.0%
				Explosives	0.0%	0.0%	0.0%
	Sample Count		**73**	Other Chemicals	0.0%	0.0%	0.0%

3.6 By Demographics

Samples were grouped according to household income and size using Census tract information corresponding to the collection routes. If the collection route covered multiple Census tracts, and if the household income and size of the various Census tracts fell into different categories (as defined below in Sections 3.6.1 and 3.6.2), the sample was excluded from the analysis.

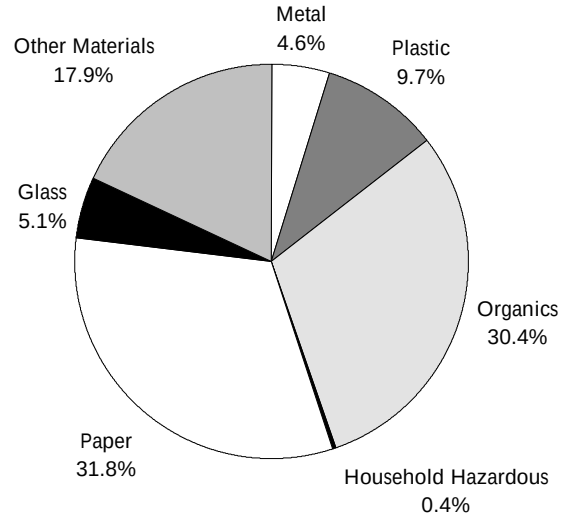
3.6.1 Income

Figure 3-5 summarizes the material categories for the low (< $26,615), medium (> $26,614 to < $35,895) and high (> $35,894) income households. The income levels were determined by first identifying the median income of each Census tract included in the study, then dividing the samples into three groups of roughly equal size.

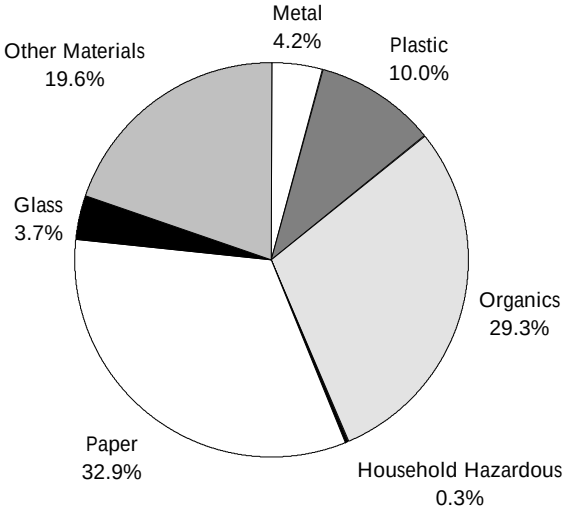
The waste composition of each is very similar, with the paper and organics categories accounting for the majority of each substream's waste (62.2% for all three income levels).

Figure 3-5 Composition Summary, by Household Income
May 1994 - May 1995

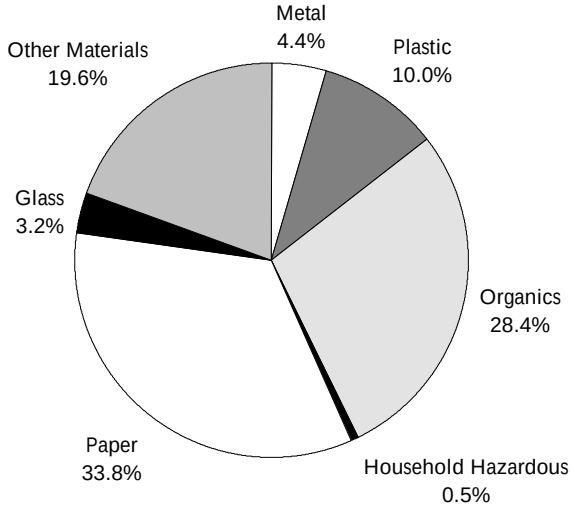
Low Income



Medium Income



High Income



Detailed results of the waste composition calculations for low income households are shown in Table 3-13. Three components account for a combined total of 45.3% of this sector's waste:

- Food 25.1%
- Compostable/Soiled Paper 11.1%
- Mixed Low Grade Paper 9.1%

Table 3-13 Composition by Weight: Low Income
May 1994 - May 1995

	Mean %	Low %	High %		Mean %	Low %	High %
PAPER	**31.8%**			**ORGANICS**	**30.4%**		
Newspaper	3.9%	3.3%	4.4%	Untreated Wood	1.2%	0.6%	1.7%
OCC/Kraft	5.4%	4.7%	6.1%	Crates/Pallets	0.1%	0.0%	0.2%
Office Paper	0.4%	0.3%	0.6%	Treated Wood	1.5%	0.5%	2.6%
Computer Paper	0.0%	0.0%	0.0%	Leaves and Grass	2.3%	1.3%	3.3%
Mixed Low Grade	9.1%	8.1%	10.0%	Prunings	0.2%	0.1%	0.3%
Phone Books	0.2%	0.1%	0.4%	Food	25.1%	23.2%	27.1%
Milk/Juice Polycoats	0.7%	0.7%	0.8%	**OTHER MATERIALS**	**17.9%**		
Frozen Food Polycoats	0.3%	0.2%	0.4%	Textiles	2.6%	1.7%	3.6%
Compostable/Soiled	11.1%	9.9%	12.3%	Carpet/Upholstery	1.5%	1.0%	1.9%
Paper/Other Materials	0.6%	0.5%	0.7%	Leather	0.1%	0.0%	0.2%
Other Paper	0.1%	0.0%	0.1%	Disposable Diapers	4.1%	3.5%	4.7%
PLASTIC	**9.7%**			Animal By-Products	3.0%	2.2%	3.8%
PET Pop & Liquor	0.5%	0.4%	0.5%	Rubber Products	0.1%	0.0%	0.2%
Other PET Bottles	0.1%	0.0%	0.1%	Tires	0.0%	0.0%	0.0%
HDPE Pop & Liquor	0.4%	0.3%	0.5%	Ash	0.0%	0.0%	0.1%
Other HDPE Bottles	0.3%	0.3%	0.4%	Furniture	0.0%	0.0%	0.0%
Other Plastic Bottles	0.4%	0.4%	0.5%	Mattresses	0.0%	0.0%	0.0%
Other Rigid Containers	0.4%	0.4%	0.5%	Small Appliances	0.2%	0.1%	0.4%
Expanded Polystyrene	0.6%	0.5%	0.7%	A/V Equipment	0.4%	0.0%	0.9%
Other Rigid Packaging	0.5%	0.4%	0.6%	Ceramics/Porcelain	0.2%	0.1%	0.3%
Grocery/Bread Bags	2.0%	1.7%	2.3%	Gypsum Drywall	1.4%	0.0%	3.3%
Other Film	3.1%	2.8%	3.4%	Fiberglass Insulation	0.0%	0.0%	0.0%
Plastic Products	0.9%	0.8%	1.1%	Rock/Concrete/Brick	0.2%	0.1%	0.4%
Plastic/Other Materials	0.4%	0.3%	0.5%	Construction Debris	0.6%	0.2%	1.0%
GLASS	**5.1%**			Sand/Soil/Dirt	1.1%	0.3%	1.8%
Clear Beverage	2.3%	1.9%	2.8%	Non-distinct Fines	1.4%	1.0%	1.9%
Green Beverage	1.0%	0.7%	1.3%	Misc. Organics	0.4%	0.2%	0.6%
Brown Beverage	0.7%	0.5%	1.0%	Misc. Inorganics	0.4%	0.2%	0.6%
Container Glass	0.9%	0.6%	1.1%	**HOUSEHOLD HAZARDOUS**	**0.4%**		
Other Glass	0.2%	0.1%	0.3%	Latex Paints	0.0%	0.0%	0.1%
METAL	**4.6%**			Adhesives/Glues	0.0%	0.0%	0.0%
Aluminum Cans	0.5%	0.4%	0.6%	Oil-based Paints/Solvents	0.0%	0.0%	0.1%
Alum. Foil/Containers	0.2%	0.2%	0.3%	Cleaners	0.0%	0.0%	0.0%
Other Aluminum	0.1%	0.0%	0.1%	Pesticides/Herbicides	0.0%	0.0%	0.0%
Tin Food Cans	1.5%	1.3%	1.7%	Dry-Cell Batteries	0.1%	0.1%	0.2%
Ferrous	1.1%	0.7%	1.5%	Wet-Cell Batteries	0.0%	0.0%	0.0%
Nonferrous	0.0%	0.0%	0.0%	Gasoline/Kerosene	0.0%	0.0%	0.0%
Mixed Metals/Materials	1.2%	0.8%	1.7%	Motor Oil/Diesel Oil	0.0%	0.0%	0.0%
				Asbestos	0.0%	0.0%	0.0%
				Explosives	0.0%	0.0%	0.0%
	Sample Count		**59**	Other Chemicals	0.2%	0.0%	0.3%

Table 3-14 lists the waste composition for medium income households. The most prevalent components include:

- Food 23.6%
- Compostable/Soiled Paper 11.7%
- Mixed Low Grade Paper 9.6%
- OCC/Kraft Paper 5.0%

Combined, these items comprise 49.9% of the medium income households' wastes.

Table 3-14 Composition by Weight: Medium Income
May 1994 - May 1995

	Mean %	Low %	High %		Mean %	Low %	High %
PAPER	**32.9%**			**ORGANICS**	**29.3%**		
Newspaper	3.6%	3.1%	4.1%	Untreated Wood	1.1%	0.7%	1.4%
OCC/Kraft	5.0%	4.4%	5.6%	Crates/Pallets	0.1%	0.0%	0.2%
Office Paper	0.6%	0.4%	0.7%	Treated Wood	0.9%	0.4%	1.3%
Computer Paper	0.0%	0.0%	0.0%	Leaves and Grass	2.5%	1.5%	3.4%
Mixed Low Grade	9.6%	8.8%	10.3%	Prunings	1.2%	0.0%	2.4%
Phone Books	0.1%	0.0%	0.1%	Food	23.6%	22.0%	25.2%
Milk/Juice Polycoats	1.0%	0.9%	1.1%	**OTHER MATERIALS**	**19.6%**		
Frozen Food Polycoats	0.3%	0.2%	0.3%	Textiles	1.9%	1.7%	2.2%
Compostable/Soiled	11.7%	10.6%	12.7%	Carpet/Upholstery	1.6%	0.5%	2.6%
Paper/Other Materials	1.0%	0.7%	1.2%	Leather	0.1%	0.0%	0.1%
Other Paper	0.2%	0.1%	0.4%	Disposable Diapers	4.1%	3.5%	4.7%
PLASTIC	**10.0%**			Animal By-Products	4.0%	3.2%	4.8%
PET Pop & Liquor	0.3%	0.2%	0.3%	Rubber Products	0.3%	0.1%	0.6%
Other PET Bottles	0.1%	0.1%	0.1%	Tires	0.0%	0.0%	0.0%
HDPE Pop & Liquor	0.3%	0.3%	0.4%	Ash	0.1%	0.0%	0.2%
Other HDPE Bottles	0.3%	0.3%	0.4%	Furniture	0.1%	0.0%	0.2%
Other Plastic Bottles	0.5%	0.4%	0.5%	Mattresses	0.0%	0.0%	0.0%
Other Rigid Containers	0.6%	0.5%	0.6%	Small Appliances	0.2%	0.1%	0.3%
Expanded Polystyrene	0.5%	0.5%	0.6%	A/V Equipment	0.2%	0.0%	0.3%
Other Rigid Packaging	0.6%	0.5%	0.6%	Ceramics/Porcelain	0.4%	0.1%	0.7%
Grocery/Bread Bags	1.8%	1.6%	2.0%	Gypsum Drywall	0.6%	0.2%	1.0%
Other Film	3.4%	3.2%	3.7%	Fiberglass Insulation	0.1%	0.0%	0.2%
Plastic Products	1.0%	0.8%	1.2%	Rock/Concrete/Brick	0.4%	0.2%	0.7%
Plastic/Other Materials	0.6%	0.4%	0.8%	Construction Debris	0.8%	0.4%	1.1%
GLASS	**3.7%**			Sand/Soil/Dirt	1.2%	0.6%	1.9%
Clear Beverage	1.2%	1.0%	1.5%	Non-distinct Fines	2.6%	2.2%	3.1%
Green Beverage	0.8%	0.7%	1.0%	Misc. Organics	0.6%	0.3%	0.8%
Brown Beverage	0.6%	0.4%	0.7%	Misc. Inorganics	0.2%	0.1%	0.3%
Container Glass	0.8%	0.7%	1.0%	**HOUSEHOLD HAZARDOUS**	**0.3%**		
Other Glass	0.2%	0.2%	0.3%	Latex Paints	0.0%	0.0%	0.1%
METAL	**4.2%**			Adhesives/Glues	0.0%	0.0%	0.0%
Aluminum Cans	0.4%	0.4%	0.5%	Oil-based Paints/Solvents	0.0%	0.0%	0.1%
Alum. Foil/Containers	0.3%	0.2%	0.3%	Cleaners	0.0%	0.0%	0.0%
Other Aluminum	0.0%	0.0%	0.0%	Pesticides/Herbicides	0.0%	0.0%	0.0%
Tin Food Cans	1.5%	1.4%	1.6%	Dry-Cell Batteries	0.1%	0.1%	0.1%
Ferrous	0.7%	0.5%	0.9%	Wet-Cell Batteries	0.0%	0.0%	0.0%
Nonferrous	0.0%	0.0%	0.0%	Gasoline/Kerosene	0.0%	0.0%	0.0%
Mixed Metals/Materials	1.3%	1.0%	1.6%	Motor Oil/Diesel Oil	0.0%	0.0%	0.1%
				Asbestos	0.0%	0.0%	0.0%
				Explosives	0.0%	0.0%	0.0%
	Sample Count		**88**	Other Chemicals	0.0%	0.0%	0.1%

As shown in Table 3-15, four components account for 50% of the high income households' waste:

- Food 23.5%
- Mixed Low Grade Paper 10.6%
- Compostable/Soiled Paper 10.5%
- OCC/Kraft Paper 5.4%

Table 3-15 Composition by Weight: High Income
May 1994 - May 1995

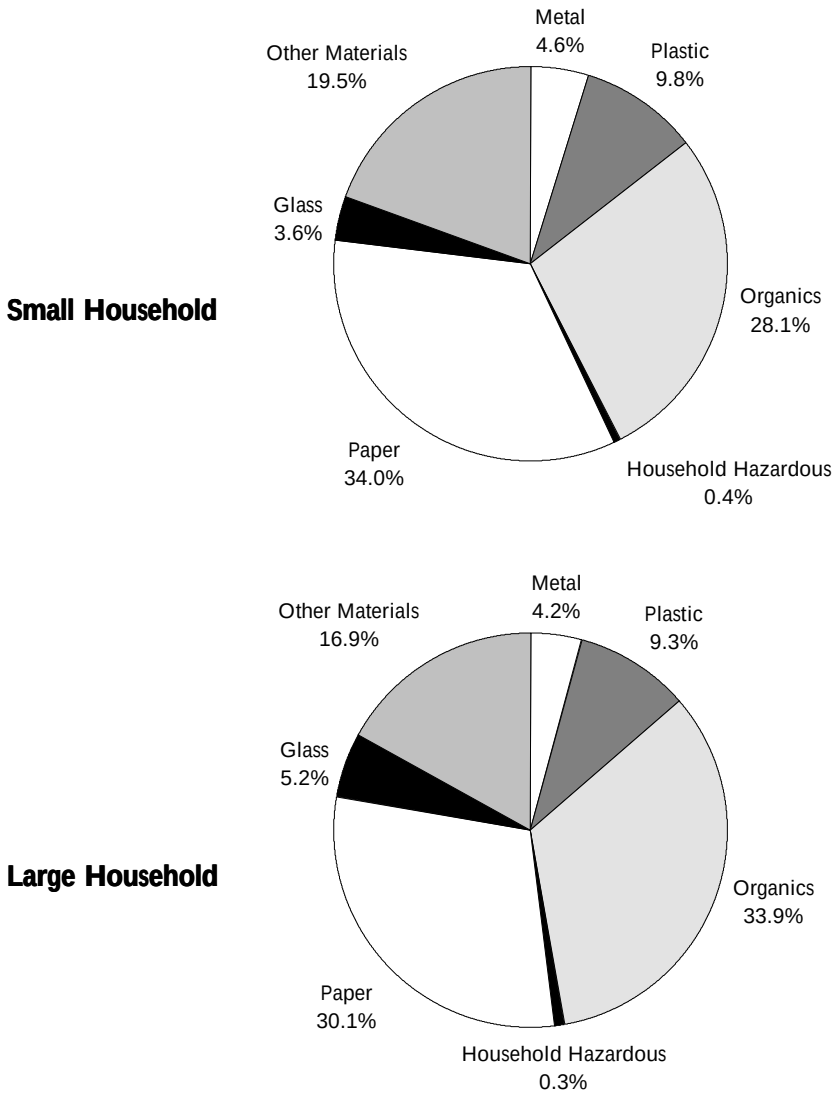
	Mean %	Low %	High %		Mean %	Low %	High %
PAPER	**33.8%**			**ORGANICS**	**28.4%**		
Newspaper	3.8%	3.3%	4.4%	Untreated Wood	1.5%	0.7%	2.2%
OCC/Kraft	5.4%	4.8%	6.0%	Crates/Pallets	0.0%	0.0%	0.1%
Office Paper	0.6%	0.4%	0.7%	Treated Wood	1.1%	0.5%	1.6%
Computer Paper	0.0%	0.0%	0.0%	Leaves and Grass	2.0%	1.2%	2.8%
Mixed Low Grade	10.6%	9.8%	11.5%	Prunings	0.3%	0.1%	0.6%
Phone Books	0.2%	0.0%	0.4%	Food	23.5%	22.0%	25.0%
Milk/Juice Polycoats	1.3%	1.2%	1.4%	**OTHER MATERIALS**	**19.6%**		
Frozen Food Polycoats	0.3%	0.2%	0.4%	Textiles	1.7%	1.4%	2.0%
Compostable/Soiled	10.5%	9.3%	11.6%	Carpet/Upholstery	1.8%	1.0%	2.6%
Paper/Other Materials	1.0%	0.8%	1.1%	Leather	0.0%	0.0%	0.1%
Other Paper	0.1%	0.1%	0.2%	Disposable Diapers	3.3%	2.8%	3.8%
PLASTIC	**10.0%**			Animal By-Products	3.5%	2.9%	4.0%
PET Pop & Liquor	0.3%	0.2%	0.3%	Rubber Products	0.3%	0.2%	0.4%
Other PET Bottles	0.1%	0.1%	0.1%	Tires	0.0%	0.0%	0.0%
HDPE Pop & Liquor	0.3%	0.2%	0.3%	Ash	0.1%	0.0%	0.2%
Other HDPE Bottles	0.4%	0.3%	0.4%	Furniture	0.3%	0.0%	0.7%
Other Plastic Bottles	0.4%	0.4%	0.5%	Mattresses	0.1%	0.0%	0.2%
Other Rigid Containers	0.7%	0.6%	0.8%	Small Appliances	0.9%	0.2%	1.6%
Expanded Polystyrene	0.7%	0.6%	0.8%	A/V Equipment	0.1%	0.0%	0.1%
Other Rigid Packaging	0.7%	0.6%	0.8%	Ceramics/Porcelain	0.2%	0.1%	0.3%
Grocery/Bread Bags	1.8%	1.5%	2.1%	Gypsum Drywall	0.6%	0.3%	0.9%
Other Film	3.4%	3.1%	3.7%	Fiberglass Insulation	0.0%	0.0%	0.1%
Plastic Products	0.9%	0.7%	1.1%	Rock/Concrete/Brick	1.1%	0.5%	1.8%
Plastic/Other Materials	0.4%	0.3%	0.5%	Construction Debris	0.9%	0.2%	1.6%
GLASS	**3.2%**			Sand/Soil/Dirt	1.0%	0.4%	1.5%
Clear Beverage	1.0%	0.9%	1.2%	Non-distinct Fines	2.4%	1.8%	2.9%
Green Beverage	0.6%	0.4%	0.8%	Misc. Organics	0.7%	0.4%	0.9%
Brown Beverage	0.6%	0.4%	0.7%	Misc. Inorganics	0.7%	0.4%	0.9%
Container Glass	0.6%	0.5%	0.8%	**HOUSEHOLD HAZARDOUS**	**0.5%**		
Other Glass	0.3%	0.2%	0.5%	Latex Paints	0.1%	0.0%	0.3%
METAL	**4.4%**			Adhesives/Glues	0.1%	0.0%	0.2%
Aluminum Cans	0.3%	0.3%	0.4%	Oil-based Paints/Solvents	0.0%	0.0%	0.1%
Alum. Foil/Containers	0.2%	0.2%	0.3%	Cleaners	0.0%	0.0%	0.0%
Other Aluminum	0.1%	0.0%	0.3%	Pesticides/Herbicides	0.0%	0.0%	0.0%
Tin Food Cans	1.3%	1.2%	1.4%	Dry-Cell Batteries	0.2%	0.1%	0.2%
Ferrous	1.2%	0.8%	1.6%	Wet-Cell Batteries	0.0%	0.0%	0.0%
Nonferrous	0.0%	0.0%	0.1%	Gasoline/Kerosene	0.0%	0.0%	0.0%
Mixed Metals/Materials	1.2%	0.7%	1.7%	Motor Oil/Diesel Oil	0.0%	0.0%	0.0%
				Asbestos	0.0%	0.0%	0.0%
				Explosives	0.0%	0.0%	0.0%
	Sample Count		**77**	Other Chemicals	0.1%	0.0%	0.1%

3.6.2 Household Size

Figure 3-6 summarizes the broad waste categories for small (< 2.05 people) and large (> 2.48 people) households. The groupings were determined by first identifying the median household size of each Census tract included in the study, then dividing the samples into quartiles. The small household group represents the lowest quartile, while the large household group represents the uppermost quartile.

Like the other sectors studied, paper and organics account for the majority of these wastes (62.1% of small and 64.0% of large households' material).

Figure 3-6 Composition Summary, by Household Size
May 1994 - May 1995



As shown in Table 3-16, the three most prevalent materials in the small households' waste are:

- Food 23.4%
- Compostable/Soiled Paper 11.0%
- Mixed Low Grade Paper 10.9%

Combined, these materials account for 45.3% of this sector's waste.

Table 3-16 Composition by Weight: Small Households
May 1994 - May 1995

	Mean %	Low %	High %		Mean %	Low %	High %
PAPER	**34.0%**			**ORGANICS**	**28.1%**		
Newspaper	4.2%	3.7%	4.8%	Untreated Wood	1.2%	0.5%	1.9%
OCC/Kraft	4.6%	4.0%	5.1%	Crates/Pallets	0.1%	0.0%	0.2%
Office Paper	0.4%	0.3%	0.5%	Treated Wood	0.7%	0.4%	1.1%
Computer Paper	0.0%	0.0%	0.0%	Leaves and Grass	2.4%	1.3%	3.4%
Mixed Low Grade	10.9%	9.9%	11.8%	Prunings	0.3%	0.1%	0.5%
Phone Books	0.1%	0.0%	0.3%	Food	23.4%	21.6%	25.2%
Milk/Juice Polycoats	1.0%	0.9%	1.1%	**OTHER MATERIALS**	**19.5%**		
Frozen Food Polycoats	0.4%	0.3%	0.4%	Textiles	1.6%	1.2%	1.9%
Compostable/Soiled	11.0%	9.8%	12.3%	Carpet/Upholstery	1.5%	0.6%	2.4%
Paper/Other Materials	1.0%	0.9%	1.2%	Leather	0.1%	0.0%	0.1%
Other Paper	0.4%	0.1%	0.6%	Disposable Diapers	3.0%	2.5%	3.5%
PLASTIC	**9.8%**			Animal By-Products	4.4%	3.4%	5.3%
PET Pop & Liquor	0.4%	0.3%	0.4%	Rubber Products	0.4%	0.1%	0.8%
Other PET Bottles	0.1%	0.1%	0.1%	Tires	0.0%	0.0%	0.0%
HDPE Pop & Liquor	0.3%	0.3%	0.4%	Ash	0.1%	0.0%	0.3%
Other HDPE Bottles	0.3%	0.3%	0.4%	Furniture	0.4%	0.0%	1.0%
Other Plastic Bottles	0.5%	0.5%	0.6%	Mattresses	0.0%	0.0%	0.0%
Other Rigid Containers	0.6%	0.5%	0.7%	Small Appliances	0.4%	0.1%	0.7%
Expanded Polystyrene	0.6%	0.5%	0.7%	A/V Equipment	0.1%	0.0%	0.2%
Other Rigid Packaging	0.6%	0.6%	0.7%	Ceramics/Porcelain	0.2%	0.1%	0.3%
Grocery/Bread Bags	1.3%	1.1%	1.4%	Gypsum Drywall	1.0%	0.4%	1.7%
Other Film	3.6%	3.3%	3.8%	Fiberglass Insulation	0.0%	0.0%	0.0%
Plastic Products	1.1%	0.8%	1.3%	Rock/Concrete/Brick	0.6%	0.2%	1.0%
Plastic/Other Materials	0.4%	0.3%	0.5%	Construction Debris	1.0%	0.5%	1.6%
GLASS	**3.6%**			Sand/Soil/Dirt	1.3%	0.6%	2.0%
Clear Beverage	1.1%	0.9%	1.4%	Non-distinct Fines	2.4%	1.9%	2.9%
Green Beverage	0.9%	0.7%	1.1%	Misc. Organics	0.4%	0.2%	0.6%
Brown Beverage	0.5%	0.3%	0.6%	Misc. Inorganics	0.5%	0.3%	0.8%
Container Glass	0.7%	0.5%	0.9%	**HOUSEHOLD HAZARDOUS**	**0.4%**		
Other Glass	0.3%	0.2%	0.4%	Latex Paints	0.1%	0.0%	0.2%
METAL	**4.6%**			Adhesives/Glues	0.1%	0.0%	0.1%
Aluminum Cans	0.4%	0.3%	0.4%	Oil-based Paints/Solvents	0.0%	0.0%	0.0%
Alum. Foil/Containers	0.2%	0.2%	0.3%	Cleaners	0.0%	0.0%	0.0%
Other Aluminum	0.0%	0.0%	0.1%	Pesticides/Herbicides	0.0%	0.0%	0.0%
Tin Food Cans	1.5%	1.3%	1.6%	Dry-Cell Batteries	0.1%	0.1%	0.2%
Ferrous	1.0%	0.7%	1.3%	Wet-Cell Batteries	0.0%	0.0%	0.0%
Nonferrous	0.0%	0.0%	0.0%	Gasoline/Kerosene	0.0%	0.0%	0.0%
Mixed Metals/Materials	1.6%	1.1%	2.1%	Motor Oil/Diesel Oil	0.0%	0.0%	0.0%
				Asbestos	0.0%	0.0%	0.0%
				Explosives	0.0%	0.0%	0.0%
	Sample Count		**59**	Other Chemicals	0.1%	0.0%	0.1%

Waste composition results for large households are listed in Table 3-17. Four components account for a total of 49.6% of the waste:

- Food 24.7%
- Compostable/Soiled Paper 11.2%
- Mixed Low Grade Paper 8.3%
- Leaves and Grass 5.4%

Leaves and grass make up a larger proportion of the large households' substream than any of the other sectors examined in this report.

Table 3-17 Composition by Weight: Large Households
May 1994 - May 1995

	Mean %	Low %	High %		Mean %	Low %	High %
PAPER	**30.1%**			**ORGANICS**	**33.9%**		
Newspaper	3.8%	3.3%	4.3%	Untreated Wood	1.0%	0.5%	1.5%
OCC/Kraft	4.7%	4.2%	5.1%	Crates/Pallets	0.0%	0.0%	0.1%
Office Paper	0.3%	0.2%	0.4%	Treated Wood	1.4%	0.4%	2.4%
Computer Paper	0.0%	0.0%	0.0%	Leaves and Grass	5.4%	2.8%	7.9%
Mixed Low Grade	8.3%	7.4%	9.1%	Prunings	1.4%	0.0%	2.9%
Phone Books	0.2%	0.1%	0.3%	Food	24.7%	22.8%	26.6%
Milk/Juice Polycoats	0.7%	0.6%	0.8%	**OTHER MATERIALS**	**16.9%**		
Frozen Food Polycoats	0.2%	0.2%	0.3%	Textiles	2.5%	1.7%	3.4%
Compostable/Soiled	11.2%	10.1%	12.3%	Carpet/Upholstery	2.0%	0.7%	3.3%
Paper/Other Materials	0.6%	0.5%	0.8%	Leather	0.0%	0.0%	0.1%
Other Paper	0.1%	0.0%	0.2%	Disposable Diapers	4.8%	4.1%	5.5%
PLASTIC	**9.3%**			Animal By-Products	2.2%	1.4%	2.9%
PET Pop & Liquor	0.3%	0.3%	0.4%	Rubber Products	0.2%	0.1%	0.4%
Other PET Bottles	0.1%	0.0%	0.1%	Tires	0.0%	0.0%	0.0%
HDPE Pop & Liquor	0.3%	0.3%	0.4%	Ash	0.0%	0.0%	0.1%
Other HDPE Bottles	0.3%	0.2%	0.3%	Furniture	0.0%	0.0%	0.0%
Other Plastic Bottles	0.4%	0.3%	0.4%	Mattresses	0.0%	0.0%	0.0%
Other Rigid Containers	0.4%	0.3%	0.4%	Small Appliances	0.2%	0.0%	0.4%
Expanded Polystyrene	0.6%	0.5%	0.7%	A/V Equipment	0.3%	0.0%	0.5%
Other Rigid Packaging	0.4%	0.3%	0.5%	Ceramics/Porcelain	0.2%	0.0%	0.3%
Grocery/Bread Bags	2.2%	1.9%	2.5%	Gypsum Drywall	0.4%	0.2%	0.7%
Other Film	3.0%	2.7%	3.3%	Fiberglass Insulation	0.1%	0.0%	0.1%
Plastic Products	1.0%	0.8%	1.3%	Rock/Concrete/Brick	0.3%	0.1%	0.6%
Plastic/Other Materials	0.3%	0.2%	0.4%	Construction Debris	0.4%	0.2%	0.7%
GLASS	**5.2%**			Sand/Soil/Dirt	1.0%	0.3%	1.7%
Clear Beverage	2.5%	2.1%	2.9%	Non-distinct Fines	1.2%	0.9%	1.5%
Green Beverage	0.8%	0.6%	1.1%	Misc. Organics	0.7%	0.3%	1.0%
Brown Beverage	0.7%	0.5%	0.9%	Misc. Inorganics	0.4%	0.2%	0.5%
Container Glass	1.0%	0.7%	1.2%	**HOUSEHOLD HAZARDOUS**	**0.3%**		
Other Glass	0.2%	0.1%	0.3%	Latex Paints	0.0%	0.0%	0.0%
METAL	**4.2%**			Adhesives/Glues	0.0%	0.0%	0.0%
Aluminum Cans	0.5%	0.4%	0.6%	Oil-based Paints/Solvents	0.0%	0.0%	0.1%
Alum. Foil/Containers	0.2%	0.2%	0.3%	Cleaners	0.0%	0.0%	0.0%
Other Aluminum	0.1%	0.0%	0.1%	Pesticides/Herbicides	0.0%	0.0%	0.0%
Tin Food Cans	1.6%	1.5%	1.8%	Dry-Cell Batteries	0.1%	0.1%	0.1%
Ferrous	0.8%	0.5%	1.2%	Wet-Cell Batteries	0.0%	0.0%	0.0%
Nonferrous	0.0%	0.0%	0.0%	Gasoline/Kerosene	0.0%	0.0%	0.0%
Mixed Metals/Materials	0.9%	0.6%	1.1%	Motor Oil/Diesel Oil	0.1%	0.0%	0.1%
				Asbestos	0.0%	0.0%	0.0%
				Explosives	0.0%	0.0%	0.0%
	Sample Count		**63**	Other Chemicals	0.1%	0.0%	0.3%

4. Waste Reduction Indicators

This section presents the results of an effort to quantify waste reduction. Such evaluation is challenging and seldom attempted. Reduced waste is, in fact, the waste that isn't there to be measured.

A rudimentary system for gauging waste reduction among Seattle's residential customers was developed. The measurements only have meaning in relation to the question(s) they purport to answer. Seattle defined the indicators to:

- measure trends in packaging, toxic product use and reuse of durable goods, and
- make comparisons among different subpopulations or time periods.

Indicators were selected to measure the effectiveness of City programs and to establish a baseline against which future programs are to be evaluated. Other considerations in selecting waste reduction indicators included: the desirability of examining products as well as packaging, a need to track a variety of material types, and the ability to collect indicator data simultaneously with conducting Seattle's ongoing waste sorting events.

The waste reduction indicators, along the definition and objective for each, are listed in Table 4-1.

Table 4-1 Waste Reduction Indicators' Definitions and Objectives

WR Indicator	Definition Notes	Measurement Objectives
Single Serving Soup Cups	Multi-material containers under 8 oz.; but predominantly expanded polystyrene	Track the use of single-serving packaging
Single Serving Yogurt/Dairy	Cups under 8 oz.; primarily plastic	Track the use of single-serving packaging
Single Serving Entree Containers	Predominantly frozen meals packaged in a serving tray, excluding external wrappings which did not contact food	Track the use of single-serving packaging
Pesticide Containers	Multimaterial, including pet sprays in aerosol cans and other bags/boxes of household pesticides	Track the use of toxics
Toys	Consist of all materials	Track the disposal of durable goods
Small Appliances	Small electrical appliances (excluding white goods) such as toasters, microwave ovens, power tools, curling irons, and light fixtures	Track the disposal of durable goods
Audio-Visual Equipment	Communiations equipment such as televisions, stereos, VCRs, etc.	Track the disposal of durable goods

As part of Seattle's 1994/95 monthly sorting events, the waste reduction indicators were individually sorted, then counted or weighed.[2] The results of this quantification effort are presented in Table 4-2. To facilitate comparisons over time, the measurements are expressed as ratios: either the count per ton of waste sorted, or the weight of the indicator per ton of waste sorted.

[2] Because of the extra handling, and the fact that many of these products consist of mixed materials, the field work associated with waste reduction indicators is more labor intensive than that required for the rest of the waste stream.

Appendix A

Waste Component Categories

In the 1994/95 study, waste samples were sorted by hand into 74 waste component categories. Medical wastes were excluded from sorting; virtually everything else was weighed and recorded. A list of component categories and definitions follows:

Paper

NEWSPAPER: Printed newsprint, including advertising "slicks" (glossy paper), unless found separately.

OCC/KRAFT PAPER: Old corrugated container boxes and Kraft paper, and brown paper bags, unless waxed or laminated with other paper such as glossy stock.

OFFICE PAPER: White or lightly colored sulfite/sulfate bond, copy papers, and envelopes.

COMPUTER PAPER: Continuous-feed sulfite/sulfate/ground wood computer printouts and forms of all types, excluding carbonless paper.

MIXED LOW GRADE: Low-grade, potentially recyclable papers, including junk mail, magazines, colored papers, bleached Kraft, boxboard, mailing tubes, and paperback books.

PHONE BOOKS: Telephone directories.

MILK/JUICE POLYCOAT: Bleached polycoated milk, ice cream, and aseptic juice containers.

FROZEN FOOD POLYCOATS: Bleached and unbleached polycoated frozen/refrigerator packaging, excluding polycoated milk/ice cream/aseptic containers.

COMPOSTABLE/SOILED PAPER: Paper towels, paper plates, waxed paper, tissues, waxed corrugated paper.

PAPER/OTHER MATERIALS: Predominantly paper with other materials attached, e.g., orange juice cans, spiral notebooks.

OTHER PAPERS: Carbon/carbonless copy paper, hardcover books, photographs.

Plastic

PET POP & LIQUOR: Polyethylene terephthalate translucent 2-liter and 16-ounce pop bottles, with base; PET liquor bottles, beverage bottles.

OTHER PET BOTTLES: All other PET bottles not included in above.

HDPE MILK & JUICE: High-density translucent polyethylene milk, juice, and beverage containers.

OTHER HDPE BOTTLES: All other HDPE bottles not included in above.

OTHER PLASTIC BOTTLES: Plastic bottles not otherwise classified in the defined PET or HDPE categories, includes #3-#7, unknown bottles, petroleum bottles, and other dark colored bottles.

OTHER RIGID CONTAINERS: Wide mouth jars and tubs #1-#7 such as yogurt, cottage cheese, margarine.

EXPANDED POLYSTYRENE: Includes packaging and finished products made of expanded polystyrene.

OTHER RIGID PACKAGING: Rigid plastic packaging #1-#7 and unknown (excluding expanded polystyrene). Includes clamshells, salad trays, lids, cookie tray inserts, plastic spools, toothpaste tubes.

GROCERY/BREAD BAGS: Bread, grocery, and dry cleaner plastic film bags.

OTHER FILM: Includes garbage bags and film packaging, excluding bread, grocery, and dry cleaner bags. Also includes plastic sheeting and shower curtains

PLASTIC PRODUCTS: Finished plastic products such as toys, toothbrushes, vinyl hose. Includes fiberglass resin products and materials.

PLASTIC/OTHER MATERIALS: Predominately plastic with other materials attached such as disposable razors, pens, lighters, toys, 3-ring binders.

Glass

CLEAR BEVERAGE: Includes clear pop, liquor, wine, juice, beer, vinegar bottles.

GREEN BEVERAGE: Includes green pop, liquor, wine, beer, lemon juice bottles.

BROWN BEVERAGE: Includes brown pop, beer, liquor, juice, vanilla extract bottles.

CONTAINER GLASS: All glass containers, all colors, holding solid materials such as mayonnaise, non-dairy creamer, facial cream containers.

OTHER GLASS: Window glass, light bulbs, glassware, etc.

Metal

ALUMINUM CANS: Aluminum beverage cans (UBC) and bi-metal cans made mostly of aluminum.

ALUMINUM FOIL/CONTAINERS: Aluminum food containers, trays, and foil.

OTHER ALUMINUM: Aluminum products and scrap such as window frames, cookware.

TIN FOOD CANS: Tinned steel food containers, including bi-metal cans mostly of steel.

FERROUS: Ferrous and alloyed ferrous scrap metals to which a magnet adheres and which are not significantly contaminated with other metals or materials.

NONFERROUS: Metals not derived from iron, to which a magnet will not adhere, which are not significantly contaminated with other metals or materials.

MIXED METALS/MATERIALS: Small appliances, motors, insulated wire, and finished products containing a mixture of metals, or metals and other materials, whose weight is derived significantly from the metal portion of its construction.

Organics

UNTREATED WOOD: Compostable, untreated dimensional lumber and prunings or stumps 6" or greater in diameter.

CRATES/PALLETS: Wood pallets, crates, and packaging lumber/panelboard.

TREATED WOOD: Lumber and wood products which have been painted, treated, or contaminated with other materials so as to render them difficult to compost.

LEAVES AND GRASS: Grass clippings, leaves, and weeds.

PRUNINGS: Cut prunings, 6" or less in diameter, from bushes, shrubs, and trees.

FOOD: Food wastes and scraps, including bone, rinds, etc. Excludes the weight of food containers, except when container weight is not appreciable compared to the food inside.

Other Materials

TEXTILES: Fabric materials including natural and synthetic textiles such as cotton, wool, silk, woven nylon, rayon, polyester, and other materials.

CARPET/UPHOLSTERY: General category of flooring applications consisting of various natural or synthetic fibers bonded to some type of backing material.

LEATHER: Finished products or scraps of leather.

DISPOSABLE DIAPERS: Disposable baby diapers and adult protective undergarments.

ANIMAL BY-PRODUCTS: Animal carcasses, wastes, and kitty litter.

RUBBER PRODUCTS: Finished products and scrap materials made of rubber, such as bath mats, inner tubes, rubber hose, and foam rubber.

TIRES: Vehicle tires of all types.

ASH: Fireplace, burn barrel, or fire pit ash.

FURNITURE: Mixed-material furniture such as upholstered chairs.

MATTRESSES: Mattresses and box springs.

SMALL APPLIANCES: Small electric appliances (excluding white goods) such as toasters, microwave ovens, power tools, curling irons, and light fixtures.

AUDIO/VISUAL EQUIPMENT: Televisions, stereos, radios, VCRs, etc.

CERAMICS/PORCELAIN: Finished ceramic or porcelain products such as dishware, toilets, etc.

GYPSUM DRYWALL: Used or new gypsum wallboard.

FIBERGLASS INSULATION: Fiberglass building and mechanical insulation, batt or rigid.

ROCK/CONCRETE/BRICKS: Includes rock gravel larger than 2" diameter, Portland cement mixtures (set or unset), and fired-clay bricks.

CONSTRUCTION DEBRIS: Construction debris, other than wood, which can not be classified into other component categories, e.g., asphalt shingles, mixed fine material scraps.

SAND/SOIL/DIRT: Contains mixed fines smaller than 2" in diameter.

NONDISTINCT FINES: Nondistinct organics.

MISCELLANEOUS ORGANICS: Wax, modeling clay, bar soap, cigarette butts, etc.

MISCELLANEOUS INORGANICS: Vacuum cleaner bags, other inorganics not classified elsewhere.

Household Hazardous

LATEX PAINTS: Water-based paints and similar products.

ADHESIVES/GLUES: Glues and adhesives, including rubber cement, wood putty, glazing, and spackling compounds, caulking compounds, grout, and joint and auto body fillers.

OIL-BASED PAINT/SOLVENT: Solvent-based paints, varnishes, and similar products. Various solvents, including chlorinated and flammable solvents, paint strippers, solvents contaminated with other products such as paints, degreasers and some other cleaners if the primary ingredient is (or was) a solvent, or alcohol such as methanol and isopropanol.

CLEANERS: Various acids and bases whose primary purpose is to clean surfaces, unclog drains, or perform other actions.

PESTICIDES/HERBICIDES: Variety of poisons whose purpose is to discourage or kill pests, weeds, or microorganisms. Fungicides and wood preservatives, such as pentachlorophenol, are also included.

DRY-CELL BATTERIES: Dry-cell batteries of various sizes and types, as commonly used in households.

WET-CELL BATTERIES: Wet-cell batteries of various sizes and types, as commonly used in automobiles.

GASOLINE/KEROSENE: Gasoline, diesel fuel, and fuel oils.

MOTOR OIL/DIESEL OIL: Lubricating oils, primarily used in vehicles but including other types with similar characteristics.

ASBESTOS: Asbestos and asbestos-containing wastes (if this is the primary hazard associated with these wastes).

EXPLOSIVES: Gunpowder, unspent ammunition, picric acid and other potentially explosive chemicals.

OTHER CHEMICALS: Radioactive materials and other hazardous wastes that do not fit into the above categories.

Changes to Waste Component Categories

The material types use to categorize Seattle's waste stream have been refined over the years. Table A-1 tracks these changes. (An "X" signifies that the component remains the same from the previous study period; an outline border reflects how components were split apart or grouped together.)

Table A-1 Changes to Waste Component Categories, 1988 to present

1988-89		1990		1992		1994	
Report Name	*Database Name*	*Report Name*	*Database Name*	*Report Name*	*Database Name*	*Report Name*	*Database Name*
PAPER							
Newspaper	NEWSPAP	x	x	x	x	x	x
Corrugated Paper	CORRPAP	x	x	x	x	OCC/Kraft	x
Office Paper	OFFPAP	x	x	x	x	x	x
Computer Paper	COMPPAP	x	x	x	x	x	x
Mixed Scrap Paper	SCRAPAP	x	x	x	x	Mixed Low Grade	SCRAPAP
						Phone Books	PHONE
Other Paper	NRPAP	x	x	x	x	Milk/Juice Polycoats	MILKPAP
						Frozen Food Polycoats	FROZPAP
						Compostable/Soiled	SOILPAP
						Paper/Other Materials	PAPMAT
						Other Paper	NRPAP
PLASTIC							
PET Bottles	PETBOT	x	x	x	x	PET Pop & Liquor	PETBOT
						Other PET Bottles	OTRPET
HDPE Bottles	HDPEBOT	x	x	x	x	HDPE Milk & Juice	HDPEBOT
						Other HDPE Bottles	OTRHDPE
Expanded Polystyrene	STYRO	x	x	x	x	x	x
Plastic Packaging	NRPLAS	x	x	x	x		
		Other Plastic Bottles	OTBOT	x	x	x	x
						Other Rigid Containers	TUBS
						Other Rigid Packaging	RIGPAK
						Grocery/Bread Bags	FOODBAGS
						Other Film	NRPLAS
Other Plastic Products	HARDPLAS	x	x	x	x	Plastic Products	HARDPLAS
						Plastic/Other Materials	PLASMAT
GLASS							
Nonrefillable Pop	NRPOP	x	x	x	x	Clear Beverage	CLRBEV
Refillable Pop	REPOP	x	x	x	x	Green Beverage	GRNBEV
Nonrefillable Beer	NRBEER	x	x	x	x	Brown Beverage	BRNBEV
Refillable Beer	REBEER	x	x	x	x		
Container Glass	CNTGLAS	x	x	x	x	x	x
Nonrecyclable Glass	NRGLASS	x	x	x	x	x	x
METAL							
Aluminum Cans	ALCANS	x	x	x	x	x	x
Aluminum Foil/Containers	ALCONT	x	x	x	x	x	x
Tinned Cans	TINCAN	x	x	x	x	x	x
Bi-metal Cans	BICANS	x	x	x	x	*(Starting in 1994, characterized according to predominant metal)*	
Ferrous	FERRMET	x	x	x	x	x	x
White Goods	WHTGDS	x	x	x	x	*(Starting in 1994, banned from disposal. Parts show up in "Mixed Metals")*	
Nonferrous	NONFERR	x	x	x	x	x	x
						Other Aluminum	OTRAL
Mixed Metals/Materials	MIXMET	x	x	x	x	x	x

Table A-1, continued Changes to Waste Component Categories, 1988 to present

1988-89		1990		1992		1994	
Report Name	*Database Name*	*Report Name*	*Database Name*	*Report Name*	*Database Name*	*Report Name*	*Database Name*
RUBBER							
Rubber Products	RUBBER	x	x	x	x	*moved to "Other Materials"*	x
Tires	TIRES	x	x	x	x	*moved to "Other Materials"*	x
ORGANICS							
Wood	WOOD	x	x	Untreated Wood	UNWOOD	x	x
						Crates/Pallets	PALLETS
				Treated Wood	TWOOD	x	x
Leaves and Grass	LEAVES	x	x	x	x	x	x
Prunings	PRUNINGS	x	x	x	x	x	x
Food	FOOD	x	x	x	x	x	x
OTHER MATERIALS							
Textiles	TEXTILES	x	x	x	x	x	x
						Carpet/Upholstery	CARPET
Leather	LEATHER	x	x	x	x	x	x
Disposable Diapers	DIAPERS	x	x	x	x	x	x
(Discarded from samples prior to 1994)						Animal By-Products	ANIMAL
Ash	ASH	x	x	x	x	x	x
(Prior to 1994, split among various materials; Mixed Metal, Textiles, Other Plastics, etc.)						Furniture	FURN
(Prior to 1994, split among various materials; Mixed Metal, Textiles, Other Plastics, etc.)						Mattresses	MATT
(Prior to 1994, split among various materials; Mixed Metal, Textiles, Other Plastics, etc.)						Small Appliances	APPLI
(Prior to 1994, split among various materials; Mixed Metal, Textiles, Other Plastics, etc.)						A/V Equipment	ELECTRO
Ceramics, Porcelain, China	CHINA	x	x	x	x	x	x
Gypsum Drywall	GYPSUM	x	x	x	x	x	x
Fiberglass Insulation	INSUL	x	x	x	x	x	x
Rock/Concrete/Brick	ROCKS	x	x	x	x	x	x
Other Construction Debris	DEBRIS	x	x	x	x	x	x
Sand, Dirt, Non-distinct Fines	FINES	x	x	x	x	Sand/Soil/Dirt	SOIL
						Non-distinct Fines	FINES
(Prior to 1994, mostly in "Sand, Dirt, Non-distinct Fines; also in various "Mixed" categories and "Other CDL")						Misc. Organics	MISORG
(Prior to 1994, mostly in "Sand, Dirt, Non-distinct Fines; also in various "Mixed" categories and "Other CDL")						Misc. Inorganics	MINORG
HOUSEHOLD HAZARDOUS							
Latex Paints	LATEX	x	x	x	x	x	x
Adhesives/Glues	GLUE	x	x	x	x	x	x
Oil-based Paints/Solvents	SOLVENT	x	x	x	x	x	x
Cleaners	CLEANER	x	x	x	x	x	x
Pesticides/Herbicides	PESTS	x	x	x	x	x	x
Batteries	BATTS	x	x	x	x	Dry-Cell Batteries	DRYBATT
						Wet-Cell Batteries	WETBATT
Gasoline/Kerosene	GAS	x	x	x	x	x	x
Motor Oil/Diesel Oil	OIL	x	x	x	x	x	x
Asbestos	ASBESTOS	x	x	x	x	x	x
Explosives	EXPLODE	x	x	x	x	x	x
Other Chemicals	CHEMICAL	x	x	x	x	x	x

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Appendix B

Sampling Methodology

The sorting methodology used in the 1994/95 project is different from the 1990 study in three respects.

- As part of an effort to evaluate the success of recycling and waste reduction programs, "waste reduction indicators" are now studied.
- The component categories were revised to provide more detail about specific materials in the waste stream. These category changes are tracked in Appendix A.
- Revisions to the component categories—particularly the addition of the "miscellaneous organics" and "miscellaneous inorganics" classifications—significantly decreased the amount and incidence of "supermix" (a residue composed of mixed material, each piece smaller than one half inch). In the rare cases when supermix did remain after sorting the major categories (never more than 10 pounds), the composition was visually estimated. In 1990, a sub-sample of the supermix was sorted.

Substream Definition

The objective of this task was to provide statistically significant data on the composition of Seattle's residential waste. For comparison purposes, the sector was divided into single- and multi-family substreams, defined in Table B-1.

Table B-1 Definition of Residential Substreams

Substream	Housing Type	Waste Collection
Single-Family	primarily detached single-family, duplex, triplex or fourplex	City-contracted hauler, from waste cans
Multi-Family	primarily apartments or condominiums with 5 or more units	City-contracted hauler, from dumpsters

Because trucks sometimes collect waste from both cans and dumpsters, a small portion of the waste believed to be pure multi-family waste may have actually contained single-family waste.

Sample Selection

At least 360 samples were to be sorted at the City's North and South Recycling and Disposal Stations (NRDS and SRDS). Actual counts slightly exceeded this goal, for a total of 368 samples measured during May 1994-May 1995.

Truckloads to be sampled were selected using the following procedure:

1. The two City-contracted collection companies provided information identifying every truckload of single-family and multi-family waste hauled on their weekly schedules. Each truckload was identified by:

   - collection day;
   - route number;
   - whether the route hauled single-family or multi-family waste.

   Note that the "universe" from which the sample was drawn is truckloads, not households, housing units, or neighborhoods. This was necessary because of the extreme expense of sampling at a more specific level.

2. The contractor collecting residential waste from the northern area of Seattle delivers it to the NRDS, while the southern-area contractor dumps at the SRDS. The samples were allocated to the NRDS and SRDS based on the proportion of residential waste delivered to each facility during 1993:

Table B-2 1993 Residential Tonnage

Site	1993 Tonnage		Planned Samples		Actual Samples	
NRDS	96,360	67%	240	67%	244	66%
SRDS	47,767	33%	120	33%	124	34%
Total	**144,127**		**360**		**368**	

   Due to the expense of moving the sorting crew from site to site, sampling occurred at only one station per sampling day. At a production rate of 15 samples sorted daily, 24 sampling days were required. Because more samples were needed from the north area, more sampling days were scheduled there and the north area hauler was asked to occasionally divert loads to SRDS for sampling.

3. Two sampling days per month were scheduled. Half the dates were selected at random, then the day following (or preceding, if a Friday was picked) the randomly chosen date was also selected. There were two exceptions to this process:

   - Weekends and holidays were excluded, since residential waste is not collected on those days.

   - A fairly even distribution throughout the week was required, to control for the fact that collection days correspond to specific neighborhoods. (Neighborhoods have collection on the same day each week.)

   The start day for each month alternated between the NRDS and SRDS.

4. Samples were distributed to the single- and multi-family substreams based on the best available information. It was estimated that approximately 20% of Seattle's residential waste originated from multi-family collection and 80% from single-family.

5. Fifteen trucks were selected at random (within the single- and multi-family stratification) for each sampling day. As sorting progressed, the number to be sampled was sometimes modified in response to facility problems or missing loads from previous months.

The sampling schedule is shown in Table B-3.

Table B-3 Sample Route Schedule, by Date

Month	Date	Location	(North Routes)	(South Routes)
May '94	TH 12	South RDS	SFD: 14	SFD: 3,4,11,12,13,14,15 (actual) MFD: 2nd, 3rd
"	FR 13	North RDS	SFD: 2,3,4,5,9,10,11,13,24 MFD: 2,3,7,8,9	
Jun '94	WE 22	North RDS	SFD: 2,4,7,10,12,13,15,17,18,21,22,24 MFD: 3,6,9	
"	TH 23	South RDS	SFD: 5,8,18,22	SFD: 1,2,5,6,7,9,12,14,17 MFD: 3rd, 4th
Jul '94	TH 14	South RDS	SFD: 4,17,21,22	SFD: 3,5,7,8,10,12,13,17 MFD: 1st, 3rd
"	FR 15	North RDS	SFD: 1,2,3,5,7,8,10,11,12,13,14,17,19 MFD: 2,4,8,9	
Aug '94	TU 9	North RDS	SFD: 1,2,3,5,9,10,11,12,14,15,19,21,22 MFD: 1,4,6,8	
"	WE 10	South RDS	SFD: 7,16,17,24	SFD: 1,2,3,4,6,8,16,18 MFD: 2nd, 3rd
Sep '94	MO 19	South RDS		SFD: 2,3,5,8,9,10,11,17 MFD: 2nd, 3rd
"	TU 20	North RDS	SFD: 1,2,4,6,7,8,9,10,11,12,13,15,17,18,19,20 MFD: 3,5,7,9	
Oct '94	MO 10	North RDS	SFD: 1,2,3,4,6,7,9,10,12,14,15,16,18,19,20,21,24 MFD: 1,2,9,10	
"	TU 11	South RDS		SFD: 1,3,4,6,9,11,12,16 MFD: 1st, 4th
"	TU 18	North RDS	SFD: 3,4,5,6,8,11,13,14,16,18,21,23 MFD: 2,7,10	
Nov '94	WE 9	South RDS		SFD: 3,5,7,8,9,12,14,17 MFD: 1st, 2nd
"	TH 10	North RDS	SFD: 1,2,5,7,8,10,17,18,20,22,23 MFD: 3,7,8,10	

Table B-3 Sample Route Schedule, by Date, continued

Month	Date	Location	(North Routes)	(South Routes)
Dec '94	TH 1	North RDS	SFD: 2,3,6,7,9,10,11,12,13,15,22 MFD: 3,4,6,8	
"	FR 2	South RDS		SFD: 1,2,5,9,11,13,14,18 MFD: 3rd, 4th
Jan '95	TU 17	South RDS	SFD: 2,11,15,18	SFD: 2,4,5,6,10,13,15,17 MFD: 3rd, 4th
"	WE 18	North RDS	SFD: 1,2,4,6,7,8,12,13,14,15,20,22,23 MFD: 3,4,5,9	
Feb '95	MO 6	North RDS	SFD: 1,2,5,7,9,10,13,14,15,18,22,24 MFD: 1,3,8,10	
"	TU 7	South RDS	SFD: 1,4,9,12	SFD: 1,3,7,9,11,14,15,16 MFD: 1st, 2nd
Mar '95	MO 20	South RDS	SFD: 3,12,16,18,19,23	SFD: 1,7,10,11,12,17 MFD: 1st, 4th
"	TU 21	North RDS	SFD: 1,2,4,5,7,8,9,10,11,15,19,20,21,22 MFD: 8,9	
Apr '95	WE 12	North RDS	SFD: 2,3,5,6,8,9,10,11,14,16,18,19,20,21,23 MFD: 2,7	
"	TH 20	North RDS	SFD: 1,3,4,5,6,7,8,10,11,12,13,14,16,17,19 MFD: 2,4	
"	FR 21	South RDS	SFD: 2,4,10,11,16,17,21	SFD: 4,5,7,10,11,15 MFD: 4th

Hauler and Transfer Station Participation

Sampling schedules were given to each hauler, who was requested to provide the following data:

- the geographic area the route covered on the sorting day (the morning and afternoon runs for northern sector), and
- the number of accounts included in the run on that day (or on the route as a whole, for the southern contractor).

As the sampling days approached, the hauler was requested to inform the drivers of trucks to be included in the sample. Each involved driver was then made aware of the process to be followed upon entering the transfer station at the completion of his run.

Transfer station managers were also given the sampling schedule and other pertinent information. The field manager worked out the details of truck diversion, sample extraction, sorting, and disposal of sorted waste with each transfer station manager.

Field Sampling Procedures

Pre-established daily sampling schedules were used for each day's sampling. Truck identification numbers, obtained from the haulers just prior to sampling, were recorded before each sort. As each sample load arrived, the field supervisor noted the total load weight and approximate arrival time.

The entire truckload of waste was dumped into the pit. Wherever possible, an imaginary 8-section, 2-layer grid (16 cells total) was superimposed on the load, and a randomly selected cell was identified for sampling. Frequently, to prevent the commingling of garbage to be sampled with that in the pit, the loader would nose in the stream of material falling from the truck, capturing a 5-cubic yard slice of garbage. Approximately 250 pounds of waste were dumped from the loader onto a tarp for sorting.

Each sample was sorted by hand into the defined component groups. Food containers were separated from the food and classified according to the containers' material. Each sample was sorted to the greatest reasonable detail. Rarely, a "supermix" of material (a residue composed of mixed material, each piece smaller than one half inch) remained after sorting a sample. In these cases, the field supervisor weighed the combined supermix (never totaling more than 10 pounds) and visually estimated the percentage of each component material in the supermix. The weights of all materials were recorded on tally sheets, shown in Exhibit B-1.

Waste reduction indicator components were extracted from their regular categories and recorded separately. After being checked by the field supervisor, the tally sheets were delivered for data entry.

Exhibit B-1 Sampling Tally Sheet

side one of sampling form goes here

OTHER WASTES

Furniture				
Mattresses				
Small Appliances				
Audio/Visual Equipment				
Ceramics/China				
Gypsum				
Fiberglass Insulation				
Rock/Concrete/Bricks				
Construction Debris				
Sand/Soil/Dirt				
Non-distinct Fines				
Misc. Inorganics				

HAZARDOUS/SPECIAL WASTES

Latex Paints		
Adhesives/Glues		
Oil-based Paints/Thinners		
Caustic Cleaners		
Pesticides/Herbicides		
Dry-Cell Batteries		
Wet-Cell Batteries		
Gasoline		
Motor Oil/Diesel Oil		
Asbestos		
Explosives		
Other Chemicals		

SUPERMIX:

Load Type:

Route (RD1): **AM** **PM** **Date:**

Hauler: General Disposal U.S. Disposal

Load Destination: NRDS SRDS

Total Load Weight:

Residence Type: 1 2

Census Tract 1:

Income 1: **Size 1:**

Census Tract 2:

Income 2: **Size 2:**

Number of Accounts: **Total Sample Weight:**

REDUCTION INDICATORS

	Pounds			
Cup - 'O - Soups				
Yogurt Cups				
Single-Serving Entree'				
Toys				

	Count			
Pesticide Containers				
Small Appliances				
A/V Electronics				

Appendix C

Comments on Monthly Sampling Events

MAY 1994
Sampling began on May 12 at the SRDS. Ten samples were sorted, including one diverted south from the NRDS. On May 13, at the NRDS, 14 samples were sorted, all originally destined for the NRDS.

JUNE 1994
Sixteen samples were captured from northern routes at the NRDS on June 22. The next day, at the SRDS, 13 south routes and two diverted northern routes were sampled. An additional make-up load from the north was sorted on the 30th at the SRDS.

JULY 1994
Four make-up loads were sorted on July 6 at the SRDS, all from the south. On the 14th, 11 samples were taken at the SRDS, again, all from southern routes. On July 15, 19 northern loads were sampled at the NRDS.

AUGUST 1994
Fifteen northern routes were sampled on August 9 at the NRDS. Eleven southern and four diverted northern routes were sampled at the SRDS on the 10th.

SEPTEMBER 1994
Ten southern routes were sampled at the SRDS on the September 19. The next day 17 samples were captured at the NRDS.

OCTOBER 1994
Fifteen samples were taken from northern routes at the NRDS on the October 10. Ten southern routes were sampled the next day at the SRDS. An additional sampling day at the NRDS occurred on the 18th, with 15 loads sampled.

NOVEMBER 1994
Ten southern routes were sampled on November 9th at the SRDS. Fifteen northern routes were sampled on the next day at the NRDS.

DECEMBER 1994
On December 1st, 15 northern routes were sampled at the NRDS. Ten southern samples occurred on the 2nd at the SRDS.

JANUARY 1995
Eight southern routes were sampled on January 17th at the SRDS, and 13 northern routes on the 18th , at the NRDS.

FEBRUARY 1995

On February 6th, 15 northern routes were sampled at the NRDS. On the 7th, eight southern routes and four diverted northern routes were sampled at the SRDS.

MARCH 1995

Sampling scheduled for March 21st at the SRDS was rescheduled for the 28th, due to a compactor breakdown at the NRDS, which caused an overflow of material at the SRDS, as loads were diverted south. The next day, sampling began as scheduled at the NRDS, but continued compactor problems forced an early conclusion to the day's sampling. Nine samples were sorted before leaving the NRDS on the 22nd. On the 27th, thirteen samples were taken at the NRDS. Ten southern samples were taken on the 28th, at the SRDS.

APRIL 1995

An additional day of sampling at the NRDS occurred on April 12th, during which 17 samples were taken. Sampling on northern routes was again conducted on the 20th, with another 17 samples. Ten southern samples were captured on the 21st at the SRDS. It was determined that a shortage of northern single-family routes would be made up on May 9th, when an additional seven samples were taken at the NRDS.

Appendix D

Waste Composition Calculations

Composition calculations were performed in the same manner as the previous study periods. In addition, weighting factors were derived to compensate for an estimating error made during the planning phase of the project. Finally, the statistical analyses have been refined for the 1994/95 residential project. Each of these calculations is described below.

Composition Calculations

The composition estimates represent **component percentages by weight** for each noted substream. They are derived by summing each component's weight across all of the selected records, as shown in the following equation:

$$C = \left(\frac{w}{t}\right) \times 100$$

where: C = Component mean percentage by weight for the selected samples.
w = Sum of the component weights in pounds for the selected samples.
t = Sum of the sample weights in pounds for the selected samples.

Precision levels at the 90% confidence level are calculated for a component's mean as follows:

$$PL_{lbs} = \pm \frac{(z \times s)}{\sqrt{n}}$$

where: z = Value of the t statistic (1.645) corresponding to a 90% confidence level.
s = Standard deviation of the mean component weight of the selected samples.
n = Number of selected samples.

The formula above results in a precision level expressed as a range of pounds around the mean component weight per sample. This is converted to a percentage as follows:

$$PL_{pct} = \left(\frac{PL_{lbs}}{x}\right) \times C$$

where: x = Mean value in pounds for the component.

The precision **range** for each component's proportion estimate is then calculated:

Lower limit of range = C - PL_{pct}
Upper limit of range = C + PL_{pct}

Weighting Factors

The initial plan assigned samples to each service area and residence type based on the best available estimates of disposed tonnage. Afterwards, more accurate data were available; the actual single- and multi-family proportions were found to be substantially different from the initial disposal estimates.

In order to accurately characterize the overall residential waste stream, weighting factors were calculated to compensate for the estimating error. The factors adjust the sampling data so that the relative influence of each sector reflects Seattle's actual residential tonnage distribution, as shown in Table D-1.

Table D-1 Weighting Factors

	Actual % of Tonnage	Ideal # of Samples	Actual # of Samples	Weighting Factors
OVERALL RESIDENTIAL				
South, SF	25.08%	92	100	0.9229
South, MF	8.89%	33	24	1.3629
North, SF	33.18%	122	197	0.6198
North, MF	32.86%	121	47	2.5726
		368	368	
TOTAL SINGLE-FAMILY				
South, SF	43.05%	128	100	1.2785
North, SF	56.95%	169	197	0.8586
		297	297	
TOTAL MULTIFAMILY				
South, MF	21.29%	15	24	0.6299
North, MF	78.71%	56	47	1.1890
		71	71	
TOTAL SOUTH				
South, SF	73.83%	92	100	0.9155
South, MF	26.17%	32	24	1.3521
		124	124	
TOTAL NORTH				
North, SF	50.24%	123	197	0.6223
North, MF	49.76%	121	47	2.5831
		244	244	

In the body of the report, waste characterization results for the affected summaries (overall residential, single-family, multi-family, north and south substreams) were calculated using weighted averages. The other waste characterizations presented (by season and household demographics), and the statistical analyses, are unaffected by the sampling misallocation. Thus, these results were not weighted.

Appendix E

Statistical Analyses

Overview

This appendix includes a summary of both the methods and results of statistical analyses conducted for this study. Waste composition comparisons were performed on the following data sets:

- Residence Type: single-family vs. multi-family
- Destination: North vs. South
- Study Period: 1990 vs. 1994

Waste Categories Analyzed

As shown in Table E-1, the residence type and destination comparisons were based on 11 categories, which in turn include several individual waste components. The 1990 to 1994 examination utilizes the major waste category groups used throughout the body of this report.

Table E-1 Categories for Analysis

Within Year Comparisons	
Label	**Includes**
Newspaper	NEWSPAP
OCC/Kraft	CORRPAP
Curb Mix Pap	OFFPAP
	COMPAP
	SCRAPAP
	PHONE
Curb Plas	PETBOT
	OTRBOT
	HDPEBOT
	OTRHDPE
N Curb Plas	OTBOT
	TUBS
	STYRO
	RIGPAK
	FOODBAGS
	NRPLAS
	HARDPLAS
	PLASMAT
Curb Glass	CLRBEV
	GRNBEV
	BRNBEV
	CNTGLAS
Aluminum	ALCANS
	ALCONT
Tin	TINCAN
Curb Yard	LEAVES
	PRUNINGS
Food	FOOD
Hazard	LATEX
	GLUE
	SOLVENT
	CLEANER
	PESTS
	DRYBATT
	WETBATT
	GAS
	OIL
	ASBESTOS
	EXPLODE
	CHEMICAL

1990 vs 1994 Comparisons			
Label	**Includes**	**Label**	**Includes**
Paper 90	NEWSPAP	Paper 94	NEWSPAP
	CORRPAP		CORRPAP
	OFFPAP		OFFPAP
	COMPPAP		COMPPAP
	SCRAPAP		SCRAPAP
	NRPAP		PHONE
			MILKPAP
			FROZPAP
			SOILPAP
			PAPMAT
			NRPAP
Plastic 90	PETBOT	Plastic 94	PETBOT
	OTBOT		OTRBOT
	HDPEBOT		HDPEBOT
	STYRO		OTRHDPE
	HARDPLAS		OTBOT
			TUBS
			STYRO
			RIGPAK
			FOODBAGS
			NRPLAS
			HARDPLAS
			PLASMAT
Glass 90	CNTGLASS	Glass 94	CNTGLASS
	NRGLASS		NRGLASS
	REBEER		CLRBEV
	NRBEER		GRNBEV
	REPOP		BRNBEV
	NRPOP		
Metal 90	ALCAN	Metal 94	ALCAN
	ALCON		ALCON
	TINCAN		TINCAN
	FERRMET		FERRMET
	NONFER		NONFER
	MIXMET		MIXMET
	BICAN		OTRAL
	WHTGDS		
Organics 90	WOOD	Organics 90	UNWOOD
	LEAVES		TWOOD
	PRUNINGS		PALLETS
	FOOD		LEAVES
			PRUNINGS
			FOOD
Hazard 90	LATEX	Hazard 94	LATEX
	GLUE		GLUE
	SOLVENT		SOLVENT
	CLEANER		CLEANER
	PESTS		PESTS
	BATTS		DRYBATT
	GAS		WETBATT
	OIL		GAS
	ASBESTOS		OIL
	EXPLODE		ASBESTOS
	CHEMICAL		EXPLODE
			CHEMICAL
Other 90	TEXTILES	Other 94	TEXTILES
	LEATHER		LEATHER
	DIAPERS		DIAPERS
	RUBBER		RUBBER
	TIRES		TIRES
	ASH		ASH
	CHINA		CHINA
	GYPSUM		GYPSUM
	INSUL		INSUL
	ROCKS		ROCKS
	DEBRIS		DEBRIS
	FINES		FINES
			CARPET
			SOIL
			MISORG
			MINORG

Statistical Considerations

All analyses were based on the component percentages, by weight, for each selected substream. As described in Appendix D, these percentages are calculated by dividing the sum of the selected component weights by the sum of the corresponding sample weights. T-tests (modified for ratio estimation) were used to examine the differences between substreams.

Normality

The distribution of some of the waste categories (particularly the hazardous materials) are skewed and may not follow a normal distribution.[1] Although t-tests assume a normal distribution, they are very robust to departures from this assumption. In addition, each selected category includes several individual waste components, which improves our ability to meet the assumptions of normality.

Dependence

There may be dependence between waste types (if a person disposes of material A, they always dispose of material B at the same time).

There is certainly a degree of dependence between the calculated percentages, particularly in the case of the 1990 vs. 1994 analysis, where all the waste components are included. (Since the percentages sum to 100, if the percentage of material A increases, the percentage of some other material must decrease).

Future studies might want to examine these two types of dependence explicitly.

Multiple T-Tests

In all statistical tests, there is a chance of calculating "false positive" results. Seattle's waste composition analysis required conducting several t-tests, (one for each waste category within each set of substreams) **each** of which carries that risk. However, we were only willing to accept a 10% chance, **overall**, of making an incorrect conclusion. Therefore, each test was adjusted by setting the significance threshold to $\frac{0.10}{w}$ (w = the number of t-tests).

The adjustment can be explained as follows:

For each test, there is a $1-\frac{0.10}{w}$ chance of not making a mistake. There is a $\left(1-\frac{0.10}{w}\right)^{w}$ chance of not making a mistake during any of the tests.

Since one minus the chance of not making a mistake equals the chance of making a mistake, the risk of making a wrong conclusion during any of the tests is $\left(1-\left(1-\frac{0.10}{w}\right)^{w}\right)=0.10$.

[1] Please refer to the boxplots included at the end of this Appendix for a visual summary of each category's distribution. Boxplots are often used to compare the distributions of continuous variables across several factors (for instance, North vs. South.) The center white line is the median point and the dark black box contains the central 50% of the data. The whiskers describe the endpoints for most of the data and can be set to different values depending on the purpose of the plot. Potential outliers (data points that fall outside of these bounds) are drawn individually.

Minimum Detectable Difference

The greater the number of samples, the greater the ability to detect differences between substreams. In this study, enough samples were collected to allow the waste composition to be calculated very precisely. Thus, the analyses are able to pinpoint tiny (but statistically significant) differences. In the future, an *a priori* power analysis might benefit this research by determining how may samples would be required to detect a particular minimum difference of interest.

Equations

First, the variance around the estimate is calculated, accounting for the fact that the ratio includes two random variables (the component and total sample weights). The **variance of the ratio estimator** equation follows:

$$\hat{V}_{r_j} = \left(\frac{1}{n}\right) \cdot \left(\frac{1}{\overline{w}^2}\right) \cdot \left(\frac{\sum_i \left(c_{ij} - r w_i\right)^2}{n-1}\right)$$

where:

r = ratio of component weight [c] to total weight [w]

c = weight of particular component

w = sum of all component weights

for i 1 to n

where n = number of selected samples

for j 1 to m

where m = number of components

Second, a **pooled sample variance** across the two groups to be compared is calculated:

$$S_{pool}{}^2 = \frac{\left[(n1-1)\cdot\left(n1\cdot\hat{V}_{r_j 1}\right)\right] + \left[(n2-1)\cdot\left(n2\cdot\hat{V}_{r_j 2}\right)\right]}{n1+n2-2}$$

Third, the **t-statistic** is constructed:

$$t = \frac{(r1-r2)}{\sqrt{\frac{S_{pool}{}^2}{n1} + \frac{S_{pool}{}^2}{n2}}}$$

The p-value of the t-statistic is calculated based on (n1 + n2 -2) degrees of freedom.

Interpreting the Results

The following tables include the mean ratio within each waste category, the t-statistic and the p-value associated with that statistic.

The **mean of the ratio** is calculated as the mean of the denominator (waste category weight) over the mean of the numerator (complete sample weight); it is not calculated as the average ratio. The ratio variances were calculated as suggested in Scheaffer, Mendenhall and Ott (1979).

The **p-value** describes the probability of observing these results if there were no true difference between the substreams. The **alpha-level** is the cut-off for determining statistically significant results. As described above, the alpha-level for this study is restricted to an overall 10% chance of a "false positive" result.

The single-family vs. multi-family analysis is presented in Table E-2. As shown, there are several small, but statistically significant, differences according to residence type. There is a greater percentage of non-curbside plastic and food in the single-family substream and more newspaper, OCC/Kraft, curbside glass and aluminum in the multi-family waste.

Table E-2 Comparison by Residence Type

	Mean Ratio *(Material Wt/Total Wt)*		**t-Statistic**	**p-Value** $\alpha = 0.10$
	Single-Family	*Multi-Family*		*(restricted by the number of t-tests)*
Newspaper	0.0384	0.0887	-10.9805	0.0000 * significant
OCC/Kraft	0.0517	0.0774	-5.7590	0.0000 * significant
Curbside Paper	0.0162	0.1194	-2.0357	0.0425
Curbside Plastic	0.0109	0.0105	0.5631	0.5737
Non-Curbside Plastic	0.0884	0.0718	4.9382	0.0000 * significant
Curbside Glass	0.0336	0.0437	-2.9093	0.0038 * significant
Aluminum	0.0066	0.0086	-3.0613	0.0024 * significant
Tin	0.0141	0.0152	-1.0385	0.2997
Food	0.2377	0.1591	7.4502	0.0000 * significant
Yard Debris	0.0329	0.0360	-0.2858	0.7752
Household Hazardous	0.0045	0.0048	-0.1635	0.8702

The North vs. South comparison is shown in Table E-3. These findings indicate that there is more curbside paper in the North than the South, while there are greater proportions of curbside glass, tin and yard debris in the South.

Table E-3 Comparison by Destination

	Mean Ratio (Material Wt/Total Wt)		t-Statistic	p-Value $\alpha = 0.10$ (restricted by the number of t-tests)
	North	*South*		
Newspaper	0.0520	0.0428	1.9890	0.0475
OCC/Kraft	0.0595	0.0522	1.8298	0.0681
Curbside Paper	0.1182	0.0907	5.2240	0.0000 * significant
Curbside Plastic	0.0110	0.0104	1.0321	0.3027
Non-Curbside Plastic	0.0871	0.0807	2.2203	0.0270
Curbside Glass	0.0319	0.0432	-3.9154	0.0000 * significant
Aluminum	0.0067	0.0077	-1.9865	0.0477
Tin	0.0134	0.0162	-3.4218	0.0007 * significant
Food	0.2173	0.2294	-1.2698	0.2049
Yard Debris	0.0226	0.0551	-3.6434	0.0003 * significant
Household Hazardous	0.0052	0.0034	1.4798	0.1398

The 1990 to 1994 results are described in Table E-4. Over this time period, the relative amount of plastic and glass in Seattle's waste stream decreased and the fraction of organic wastes increased.

Because the waste category percentages are dependent (they must sum to 100), caution should be used when interpreting these results. Did the proportion of organics truly increase, or is this caused by the reduction in plastic and glass? A second calculation, which ignored plastic and glass in both years, was conducted and confirms the increase of organics relative to the rest of the waste ($t = 3.823$, p-value = 0.0051).

Very conservative tests were employed to correct for the multiple t-tests. Therefore, the borderline results for paper should not be entirely discounted. Although the decrease in the paper category did not meet the stringent significance criteria, it is still very unlikely that these data would be observed purely by chance.

Table E-4 Comparison by Study Period

	Mean Ratio (Material Wt/Total Wt)		t-Statistic	$\alpha = 0.10$ (restricted by the number of t-tests)
	1990	*1994*		
Paper	0.3782	0.3458	-2.9577	0.0182
Plastic	0.1264	0.0958	-8.0748	0.0000 * significant
Glass	0.0585	0.0426	-4.5954	0.0018 * significant
Metal	0.0506	0.0468	-0.8792	0.4049
Organics	0.2233	0.2783	4.9342	0.0011 * significant
Other Materials	0.1604	0.1861	-1.8493	0.1016
Household Hazardous	0.0026	0.0046	1.6415	0.1393

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Appendix F

Database Description

Data was double-entered into a Clipper database application specifically constructed for this project. In addition to the actual waste results, each record includes route, demographic and delivery characteristics of the sample. A description of the data fields and structure of each record follows.

Database Structure

Each record consists of 101 fields of fixed size and type. The database file is compatible with the dBase III Plus file construct. A complete description of all fields is given below.

The field types used include Character, Date, Numeric, and Memo. The Character and Date field widths represent the total formatted width of the field. Dates are carried as "mm/dd/yy". Numeric field widths represent the total number of digits contained, including the decimal point, if applicable. Each record can have an associated Memo of up to 64K characters in length.

Field #	Field Name	Type	Width	Dec.	Description
1	LOADTYPE	C	1		Type of Load
2	RD1	C	3		Route Designator 1
3	RD2	C	2		Route Designator 2
4	DATE	D	8		Date Collected
5	RESTYPE	C	1		Residence Type
6	GENTYPE	C	1		Generator Type
7	DESTNATN	C	1		Load Destination/Origin
8	VECLTYPE	C	1		Vehicle Type
9	TRACT1	C	5		Census Tract 1
10	TRACT2	C	5		Census Tract 2
11	RECYCLE	C	1		Recycling ?
12	HAULER	C	1		Name of Hauler
13	NUMACCTS	N	3	0	# of Accounts
14	INCOME1	N	5	0	Median Income (TRACT1)
15	INCOME2	N	5	0	Median Income (TRACT2)
16	SIZE1	N	4	2	Household Size (TRACT1)
17	SIZE2	N	4	2	Household Size (TRACT2)
18	CUPSOUP	N	6	2	Single-serving instant soup containers
19	YOGURT	N	6	2	Single-serving yogurt containers
20	ENTREE	N	6	2	Single-use entree containers
21	TOYS	N	6	2	Toys
22	PESTCNT	N	4	2	Pesticide containers
23	APPLIR	N	4	2	Small Appliances
24	ELECTROR	N	4	2	A/V Electronic devices

Field #	Field Name	Type	Width	Dec.	Description
25	TOTLOADWT	N	6	0	Net Total Load
26	TOTSAMPWT	N	7	2	Net Total Sample
27	NEWSPAP	N	6	2	Newspaper
28	CORRPAP	N	6	2	Corrugated Paper
29	SCRAPAP	N	6	2	Mixed Scrap Paper
30	PHONE	N	6	2	Telephone Directories
31	OFFPAP	N	6	2	Office Paper
32	COMPPAP	N	6	2	Computer Paper
33	MILKPAP	N	6	2	Polycoated Milk, Ice Cream
34	FROZPAP	N	6	2	Frozen Food Polycoat
35	SOILPAP	N	6	2	Compostable Paper
36	PAPMAT	N	6	2	Paper and Other Materials
37	NRPAP	N	6	2	Other Paper
38	PETBOT	N	6	2	PET Pop Bottles
39	OTRPET	N	6	2	Other PET Bottles
40	HDPEBOT	N	6	2	HDPE Milk Bottles
41	OTRHDPE	N	6	2	Other HDPE Bottles
42	OTBOT	N	6	2	Other Plastic Bottles
43	TUBS	N	6	2	Other Rigid Containers
44	STYRO	N	6	2	Expanded Polystyrene
45	RIGPAK	N	6	2	Other Rigid Packaging
46	FOODBAGS	N	6	2	Grocery/Bread Bags
47	NRPLAS	N	6	2	Plastic Packaging
48	HARDPLAS	N	6	2	Other Plastics
49	PLASMAT	N	6	2	Plastic and Other Materials
50	UNWOOD	N	6	2	Untreated Wood
51	PALLETS	N	6	2	Crates & Pallets
52	TWOOD	N	6	2	Treated Wood
53	LEAVES	N	6	2	Leaves and Grass
54	PRUNINGS	N	6	2	Prunings
55	FOOD	N	6	2	Food
56	TEXTILES	N	6	2	Textiles
57	CARPET	N	6	2	Carpet/Upholstery
58	DIAPERS	N	6	2	Diapers
59	CLRBEV	N	6	2	Clear Beverage Glass
60	GRNBEV	N	6	2	Green Beverage Glass
61	BRNBEV	N	6	2	Brown Beverage Glass
62	CNTGLAS	N	6	2	Container Glass
63	NRGLASS	N	6	2	N/R Glass
64	ALCANS	N	6	2	Aluminum Cans
65	ALCONT	N	6	2	Aluminum Containers
66	OTRAL	N	6	2	Other Aluminum
67	TINCAN	N	6	2	Tinned Cans
68	FERRMET	N	6	2	Ferrous Metals
69	NONFERR	N	6	2	Non-ferrous Metal
70	MIXMET	N	6	2	Mixed Metals
71	ANIMAL	N	6	2	Animal By-products
72	TIRES	N	6	2	Tires

Field #	Field Name	Type	Width	Dec.	Description
73	ASH	N	6	2	Ashes
74	LEATHER	N	6	2	Leather
75	RUBBER	N	6	2	Rubber Products
76	MISORG	N	6	2	Miscellaneous Organics
77	FURN	N	6	2	Furniture
78	MATT	N	6	2	Mattresses
79	APPLI	N	6	2	Small Appliances
80	ELECTRO	N	6	2	A/V Equipment
81	CHINA	N	6	2	Ceramics/China
82	GYPSUM	N	6	2	Gypsum Wallboard
83	INSUL	N	6	2	Fiberglass Insulation
84	ROCKS	N	6	2	Rocks/Concrete
85	DEBRIS	N	6	2	Construction Debris
86	SOIL	N	6	2	Sand, Soil, & Dirt
87	FINES	N	6	2	Dirt/Sand/Fines
88	MINORG	N	6	2	Misc. Inorganics
89	LATEX	N	6	2	Latex Paints
90	GLUE	N	6	2	Glues/Adhesives
91	SOLVENT	N	6	2	Oil-based paints
92	CLEANER	N	6	2	Cleaners
93	PESTS	N	6	2	Pesticides
94	DRYBATT	N	6	2	Dry-Cell Batteries
95	WETBATT	N	6	2	Wet-Cell Batteries
96	GAS	N	6	2	Gasoline
97	OIL	N	6	2	Motor, Diesel Oil
98	ASBESTOS	N	6	2	Asbestos Products
99	EXPLODE	N	6	2	Explosives
100	CHEMICAL	N	6	2	Other Chemicals
101	MEMO	M	10		Comments, etc.

Individual Record Structures

The database fields applicable to residential records are described below. Only the header information is listed, because all records contain a complete set of components (Fields 27-100) and a memo field (Field 101).

Fields which are not applicable to an individual record, or contain missing values, are filled with an "X" or "-9" for Character and Numeric fields, respectively.

Residential Records

Field #	Field Name	Type	Width	Dec	Description
1	LOADTYPE	C	1		Type of Load
2	RD1	C	3		Route Designator 1
3	RD2	C	3		Route Designator 2
4	DATE	D	8		Date Collected
5	RESTYPE		1		Residence Type
7	DESTNATN	C	1		Load Origin
9+	TRACT1	C	5		Census Tract 1
10+*	TRACT2	C	5		Census Tract 2
11	RECYCLE	C	1		Recycling?
12	HAULER	C	1		Name of Hauler
13+	NUMACCTS	N	3	0	# of Accounts
14	INCOME1	N	5	0	Median Income (TRACT1)
15	INCOME2	N	5	0	Median Income (TRACT2)
16	SIZE1	N	4	2	Household Size (TRACT1)
17	SIZE2	N	4	2	Household Size (TRACT2)
18	CUPSOUP	N	6	2	Single-serving instant soup containers
19	YOGURT	N	6	2	Single-serving yogurt containers
20	ENTREE	N	6	2	Single-use entree containers
21	TOYS	N	6	2	Toys
22	PESTCNT	N	4	2	Pesticide containers
23	APPLIR	N	4	2	Small Appliances
24	ELECTROR	N	4	2	A/V Electronic devices
25	TOTLOADWT	N	6	0	Total Load Weight
26	TOTSAMPWT	N	6	1	Total Sample Weight

\+ Not applicable to RESTYPE 2 (multifamily)

* Tract 2 data may or may not be applicable for an individual record

Field Definitions and Descriptions

Each field accepts only those values or characters which were specified as valid types of input. The valid entries and allowable ranges for each field are given below. A definition of the field is also given.

Field #	Field Name	Valid Inputs
1	LOADTYPE Load Type	R = Residential C = Commercial P = Commercial Pure S = Self Haul
2	RD1 Route Designator 1	(See Note Below)
3	RD2 Route Designator 2	(See Note Below)
4	DATE Date load was collected (not necessarily date of sample sorting)	MM/DD/YY

NOTE: SAMPLE NUMBERS

The first four fields collectively form the "Sample Number" of each record. There is no "Sample Number" field, per se. Each Sample Number Is unique, providing the user with a reference identifier for any given record, during both data collation and program use. These fields are also the four sorting key variables used by the program to sequentially store unprocessed data. The default sorting hierarchy is by DATE, LOADTYPE, RD1, and RD2. All data entry files and primary databases are organized according to these key variable.

The allowable valid inputs for the RD1 and RD2 fields are specific to the LOADTYPE of each record. Route Designator 1 can be any combination of three numbers or letters signifying the route number for all but Self Haul samples. Self Haul samples use this field for the first three vehicle license characters. Route Designator 2 identifies whether the AM or PM portion of a Residential route was sampled. For Commercial and Commercial Pure loads, RD2 represents the truck type: Roll Off, Front Loader or Rear Loader. The 24-hour

arrival time designation is contained in this field for Self Haul samples. The construction of "Sample Numbers" is given below:

Residential
Sample Number: R(_____)(_____)(_____)
| | |
| | | MMDDYY: Date Collected
| |
| | AM or PM portion of Route?
|
| XXX: Three-character Route (e.g. "065")

Commercial
Sample Number: C(_____)(_____)(_____)
| | |
| | | MMDDYY: Date Collected
| |
| | : Truck type: RO, FL or RL
|
| XXX: Three-character Route/Load Designator (e.g. "0S4")
("N" prefix indicates night load)

Commercial Pure
Sample Number: C(_____)(_____)(_____)
| | |
| | | MMDDYY: Date Collected
| |
| | : Truck type: RO, FL or RL
|
| XXX: Three-character Route (e.g. "002")

Self Haul
Sample Number: S(_____)(_____)(_____)
| | |
| | | MMDDYY: Date Collected
| |
| | ##: 24-hour arrival time of Load
|
| XXX: License characters or sequential designation

5	RESTYPE	1 = Single-family
		2 = Multi Family
	Residence Type	X = Not Applicable

6	GENTYPE Commercial Generator Type	A = Manufacturer B = Wholesaler C = Retailer D = Restaurant/Eatery E = Hotel/Motel/Inn F = Office - Private or Government G = Health Facility H = Educational Institution I = Transportation Shop J = Other Service K = Mixed Generator Types L = Construction/Demolition X = Not Applicable
7	DESTNATN Origin or destination of load	S = South Transfer Station or residential service area N = North Transfer Station or residential service area C = Newcastle Landfill B = Bayside Disposal's yard E = Evergreen (Seattle Disposal's yard)
8	VECLTYPE Type of Self Haul Vehicle which delivered the load	A = Passenger Auto (passenger plates) P = Pickup Trucks, Vans (truck plates) T = Other Trucks, and cars with trailers (truck plates) X = Not Applicable
9	TRACT1	##### - a five-digit number
10	TRACT2 Census Tract(s) from which Residential or Self Haul sample was collected	corresponding to one of 130 possible census tracts. Two decimals are implied. Two tracts may be listed for each Residential Single Family Load, or one for each Self Haul Residential Load within City limits. X = Not Applicable

11	RECYCLE	Y = Yes N = No X = Not Applicable
	For Residential:	Was Curbside Recycling in effect?
	For Commercial:	Would the Hauler normally divert this load for recycling?
12	HAULER Name of residential, commercial, or commercial pure Contract Hauler	B = Bayside Disposal S = Seattle Disposal G = General Disposal U = US Disposal X = Not Applicable
13	NUMACCTS Approximate Number of Residential Accounts served by the load	### - from 1 to 999 -9 = Not Applicable
14, 15	INCOME1 INCOME2 Median household income level, in dollars	##### up to 99,999 dollars
16, 17	SIZE 1 SIZE 2 Household size (persons per household)	#.## up to 9.99 person
18 ... 21	CUPSOUP YOGURT ENTREE TOYS Number of *pounds* found for each waste indicator category.	###.## up to 999.99 lbs

22, 23, 24	PESTCNT APPLIR ELECTROR Number of *items* found for each waste indicator category.	#.## up to 9.99 items
25	TOTLOADWT Total Net Weight in pounds of the Load from which the sample was taken	###### - up to a maximum of 999,999 lbs.
26	TOTSAMPWT Total Net Weight in pounds of the Sample, derived from the sum of all component weights	####.# - up to a maximum of 9,999.9 lbs.
27 ... 100	COMPONENTS Net Weight in pounds each of Sample Component	###.# - up to a maximum of 999.99 lbs
101	MEMO Field sampling comments, notes and miscellaneous information about the sample	Any and all text narrative is allowed in this field. This field is not an active processing field; it is part of the total historical record of the sample.