SCS ENGINEERS

Waste Composition Study
Summary of Results

Presented to:

CHATHAM COUNTY
NORTH CAROLINA

Chatham County, North Carolina

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1 INTRODUCTION

In June 2011, the Chatham County of North Carolina (the County) contracted with SCS Engineers (SCS) to conduct a waste composition analysis of waste generated in the County and disposed of at twelve collection centers throughout the County. The primary objectives of the study are as follows:

- To estimate types and quantities of recyclable waste components in the waste stream; and
- To estimate the types and quantities of construction and demolition (C&D)/bulky waste components in the bulky containers and pre-crushers at each collection center.

The basis for this waste characterization consists of one sampling event, conducted June 7th and 8th at the Waste Management Siler City Transfer Station (the Transfer Station). The data generated by the field activities will be used by the County to develop long-term waste management strategies and to evaluate the effectiveness of current recycling programs.

The waste stream characterization study consisted of two major parts:

- Manual sorting and classification of waste disposed in the twelve compactors and two pre-crushers located at various collection centers;
- Visual characterization of C&D/bulky wastes disposed of in the bulky waste containers.

The remaining sections of this report are organized as follows:

- Section 2 describes field classification and sampling methods.
- Section 3 presents project data and results gathered from the study.

Appendix A contains forms used to record data and **Appendix B** presents the Health and Safety Plan that was in effect during field activities.

2 METHODS

This section summarizes methods used to characterize the waste stream disposed of at the collection centers throughout the County and transported to the Transfer Station. Sorting activities took place on June 7th and 8th of 2011. Waste characterization activities were performed by manually sorting samples from municipal solid waste (MSW) into distinct waste categories, and visually characterizing waste disposed of in the bulky waste containers.

WASTE SAMPLING

Waste sorting was performed at the Transfer Station during the operating hours of the facility. Given the limited size of the data set, it was important that unrepresentative data were avoided. Unrepresentative data includes commercial waste or community events that generate atypical or seasonal waste. Each day vehicles carrying roll off containers from the collection centers were directed to the Transfer Station. Drivers were directed to dump their waste loads onto the Transfer Station floor. A front-end loader supplied by Waste Management gathered a sample from a random portion of each target load (approximately two hundred pounds) for classification (sorting). Two important procedural factors were considered:

- The target vehicle selected for sampling contained MSW that was representative of the type of waste typically generated in that service area; and
- The process of acquiring the waste sample did not, in itself, alter the apparent MSW composition.

After collecting a bucket-full of MSW from the targeted load, the front-end loader carried the sample to the area immediately outside the transfer station and deposited it into 32-gallon trash cans. The trash cans were weighed and set aside until at least two hundred pounds from the discharged load had been selected for characterization. This process was repeated until samples had been collected from all of the targeted loads.

NUMBER OF SAMPLES

The County provides collection of residential waste at twelve collection centers. Each collection center provides one compactor for MSW and one bulky bin for large items that do not fit in the compactor. Two of the collection centers have additional pre-crushers for bulky waste. To ensure representative sampling, one sample was taken from each pre-crusher and MSW container. These 14 samples were manually sorted. There were 12 samples from the bulky containers that were visually characterized. A total of 26 samples were characterized, manually and visually.

WASTE SORTING

The sorting and weighing program for samples entailed the use of one sorting crew and an SCS Crew Supervisor. During each day of fieldwork, waste loads from County-operated collection centers were directed to the Transfer Station. The basic procedures and objectives for sorting (as described below) were identical for each sample, each day. Sorting was performed as follows:

1. The sort crew transferred the refuse sample onto the sorting table until it was full and began sort activities. Large or heavy waste items, such as bags of yard waste, were torn open, examined and then placed directly into the appropriate waste container for subsequent weighing.
2. Plastic bags of refuse were opened and sort crew members manually segregated each item of waste, according to categories defined in **Exhibit 1** and placed it in the appropriate waste container. These steps were repeated until the entire sample was sorted.

3. At the completion of sorting, the waste containers were moved to the scale where a representative of SCS weighed each category and recorded the net weight on the Sort Data Sheet (**Appendix A**). Measurements were made to the nearest 0.1 pounds.

4. After each waste category had been recorded, the waste was loaded back into the front-end loader bucket and transferred back to the transfer station floor.

5. This four-step process was repeated until all of the day's samples taken at the site were characterized. Waste samples were maintained in as-disposed condition or as close to this as possible until the actual sorting began. Proper site layout and close supervision of sampling was maintained to avoid the need to repeatedly handle sampled wastes.

Members of the sorting crew were fully equipped with high visibility vests, puncture resistant gloves, and other safety equipment. The Health and Safety Plan is presented in **Appendix B**.

Consistent with good practice in such sampling programs, efforts were made to minimize sampling bias or other impacts on the integrity of the database. To this end, field sampling had been coordinated to avoid holidays and other out of ordinary events.

Due to the County's expressed objective for this study to evaluate recycling programs, waste sorting activities targeted recyclable materials. **Exhibit 1** details the categories for the waste sorting activities.

Exhibit 1. Description of Waste Categories

Major Waste Fractions	Waste Component Categories	Examples
Paper	Newspaper	Newspapers
	Glossy/Magazines	Magazines, catalogs
	Recyclable Corrugated Cardboard	Shipping boxes, clean cardboard
	Non-Recyclable Cardboard	Pizza boxes, wax coated
	Mixed Paper	Junk mail, office paper, recyclable paper
	Hardcover Books	Bound books
	Gable Top Containers	Juice and milk containers
	Aseptic/Coated Containers	Ice cream, box juices
	Paper Plates/Cups	Disposable paper plates and cups
	Other/Non Recyclable Paper	Tissues, take out containers

Exhibit 1. Description of Waste Categories (continued)

Major Waste Fractions	Waste Component Categories	Examples
Plastic	PET (#1) Bottles	Water, soda, and sports drink bottles
	PET (#1) Non Bottle	Clamshell take out containers
	HDPE #2 Bottles	Milk and laundry detergent bottles
	Other (#3-#5 and #7) Bottles	Tea and syrup bottles
	Plastic Film	Trash bags, shopping bags plastic packaging
	Agricultural Plastic Film	Visqueen type tarps used to protect crops
	Plastic Cups and Tubs	Recyclable cups and tubs
	Polystyrene (#6)	Solo cups, clamshell containers
	Rigid Plastics	Plastic toys, clothes hangers
	Polypropylene (#5) Woven Bags	Woven plastic
	Bottles that held toxics	Plastic motor oil or other toxic containers
Textiles	Textiles	Clothing, cloth
	Other Textiles	Carpet
	Leather	Belts, shoes
Metals	Steel Cans	Cans used for pet food and various food
	Aluminum Cans	Soda, beer cans
	Aluminum Foil	Tins and foil
	Aerosol Cans	Aerosol Cans
	Other Ferrous	Clothes hangers, steel or iron scrap metal
	Other Non-Ferrous	Aluminum, scrap metal, cookware
Glass	Clear Glass Bottles	Self Explanatory
	Green Glass Bottles	Self Explanatory
	Brown Glass Bottles	Self Explanatory
	Ceramic Glass	Porcelain, bowls and plates
	Other Glass	Plate window glass, vases, plates or bowls
Organics	Food Waste	Meat, vegetables, liquids
	Treated Wood	Preserved, painted, or chemically treated wood
	Furniture	Chairs, shelves, tables
	Mattresses	Self Explanatory
	Untreated Wood	Unpainted or treated lumber
	Pallets	Broken or intact shipping pallets
	Yard Waste	Grass, brush, leaves and trimmings
	Rubber	Inner tubes, rubber gloves, boots
	Stumps	Self Explanatory
	Other Organics	Organics not categorized above, or too small to characterize
Electronics	Computers	Self Explanatory
	Televisions	Self Explanatory
	Handheld Devices	MP3 players, cell phones, tablet computers
	Printers, VCRs	Self Explanatory
	DVDs and CDs	Self Explanatory
	Printer Ink Cartridges	Self Explanatory
	Microwaves	Self Explanatory
	Small Appliances	Toasters, corded phones
	Other Electronics	Anything with a cord, not categorized above

Exhibit 1. Description of Waste Categories (continued)

Major Waste Fractions	Waste Component Categories	Examples
Hazardous/ Special Care	Household Hazardous Waste	Cleaning products, herbicides, pesticides
	Compact Fluorescent Lamps	Self Explanatory
	Oil Filters	Self Explanatory
	Dry Cell Batteries	Self Explanatory
	Paint	Oil based paints
	Lead-Acid Batteries	Self Explanatory
C&D and Other Wastes	Infectious Waste	Bandages, tissues, bloody or other bodily fluids
	Diapers	Disposable diapers
	Pet Wastes	Kitty litter,
	Brick	Self Explanatory
	Concrete	Self Explanatory
	Drywall	Self Explanatory
	Vinyl Siding	Self Explanatory
	PVC Pipe	Self Explanatory
	Roofing Shingles	Self Explanatory
	Other Building Materials	C&D waste, not categorized above
	Fines	Materials less than ¼ inch by ¼ inch
	MSW	Some of the bulky loads contained bagged MSW. These loads were visually characterized, so this waste was not manually sorted into its components.

VISUAL CHARACTERIZATION

Visual characterization of C&D/bulky waste was performed at the Transfer Station during the operating hours of the facility. Two important procedural factors were considered:

- Operational constraints required that visual estimation be performed as quickly as possible, consistent with a reasonably good estimate of its characteristics; and
- Visual characterization data had to be compatible with and comparable to data gathered from the waste sort.

SCS used a visual characterization method to alleviate important sources of error, by relying on the observer's estimates of the mass of the material.

The entire characterization process was performed as described below.

1.) The visual estimator recorded key information for each load on the field sampling form such as vehicle type.

2.) Once the driver dumped the load onto the ground, the visual estimator walked around the load (to the extent possible) and indicated on the sampling form which material classes were present in the load.

3.) Beginning with the largest major material class present by volume, the visual estimator began to estimate the percentage of the material class by mass and recorded it on the form. This process was repeated for the next most common material class, and so forth, until the percentage of every material class had been estimated. The estimator calculated the total for this step, ensuring that it totaled 100 percent.

4.) The visual estimator rechecked to make sure the percentage estimates for the major material classes added up to 100 percent.

DATA REDUCTION

Twenty six samples were collected during the sampling event: 12 samples from Collection Center Compactors (manually sorted); 12 samples from Collection Center Bulky Bins (visually characterized); and 2 samples from Collection Center Pre-Crushers (manually sorted). Data presented include mean percentages by weight, standard deviations, and statistical confidence intervals (95 percent confidence interval) for each group of data (Compactors, Bulky Bins, and Pre-Crushers). Derivation of this data is as follows:

$$\text{Mean } \left(\overline{X}\right) = \sum_{i=1}^{n} x_i * \frac{1}{n};$$

$$\text{Standard Deviation (s)} = \sqrt{\frac{\left(n\sum x^2\right) - \left(\sum x\right)^2}{n(n-1)}}\text{; and}$$

$$\text{Upper/Lower Confidence Interval Limits} = \overline{X} \pm \left[1.96 * \left(\frac{\sigma}{\sqrt{n}}\right)\right]$$

where: n = number of samples; and
x = sample percentage.

Waste samples are acquired to estimate the County's true waste composition (i.e., the proportion of each waste component present in residential waste collected by the County). The mean is the arithmetic average of all data and the standard deviation is a measure of the dispersion in the data. Together, the mean and standard deviation determine the confidence interval. A 95 percent confidence interval is said to contain the true proportion of a waste component with 95 percent confidence (i.e., similar studies will produce the same results 95 percent of the time).

3 SUMMARY OF RESULTS

COLLECTION CENTER MSW COMPACTORS

Waste Composition

Exhibit 2 presents a compilation of the twelve waste samples obtained and sorted from each of the compactors at the collection centers in June 2011. The composition included confidence intervals based on the number of samples and variability between the samples. Based on the samples collected, the three largest subcomponents, by weight, of the residential waste stream are Food Waste (14.5 percent), Mixed Paper (12.5 percent) and Other Paper (7.7 percent). **Exhibit 3** presents the major components graphically.

Exhibit 2. Waste Composition for Collection Center Compactors

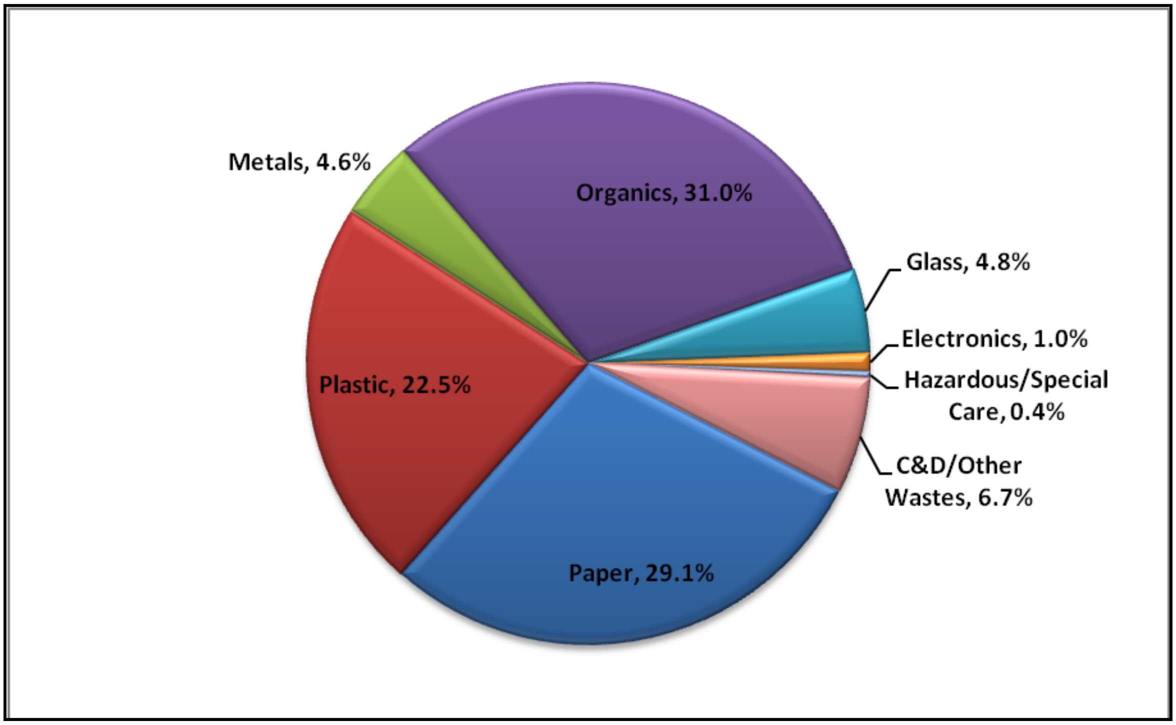
Material Components	Mean Composition	Standard Deviation	95% Confidence Limits	
			Lower	Upper
PAPER				
1 Newspaper	3.1%	2.3%	1.9%	4.4%
2 Glossy/Magazines	2.5%	1.5%	1.7%	3.4%
3 Recyclable Corrugated Cardboard	1.5%	1.4%	0.7%	2.3%
4 Non-Recyclable Cardboard	0.2%	0.5%	<0.1%	0.5%
5 Mixed Paper	12.5%	2.8%	10.9%	14.1%
6 Hardcover Books	<0.1%	<0.1%	<0.1%	<0.1%
7 Gable Top	0.2%	0.2%	<0.1%	0.3%
8 Aseptic/Coated	0.1%	0.2%	<0.1%	0.3%
9 Paper Plates	1.1%	0.9%	0.7%	1.6%
10 Other Paper	7.7%	2.3%	6.4%	9.0%
Total Paper	**29.1%**			
PLASTIC				
11 PET #1 Bottles	3.4%	1.3%	2.7%	4.1%
12 PET Non bottle	0.3%	0.3%	0.1%	0.5%
13 HDPE Bottles	1.7%	0.9%	1.2%	2.2%
14 Other Bottles	1.0%	3.0%	<0.1%	2.7%
15 Plastic Film	9.1%	3.5%	7.1%	11.1%
16 AG Plastic Film	0.2%	0.7%	<0.1%	0.6%
17 Plastic Cups/Tubs	1.1%	0.7%	0.7%	1.5%
18 Polystyrene	2.1%	0.5%	1.8%	2.4%
19 Rigid Plastics	3.3%	2.0%	2.2%	4.5%
20 PP #5 Bags	<0.1%	<0.1%	<0.1%	<0.1%
21 Bottles that held toxics	0.2%	0.3%	<0.1%	0.4%
Total Plastic	**22.5%**			
METALS				
22 Steel/Bi Metal Food Cans	1.4%	0.8%	1.0%	1.9%
23 Aluminum Cans	0.8%	0.6%	0.4%	1.2%
24 Aluminum Tin/Foil	0.5%	0.2%	0.3%	0.6%
25 Aerosol Cans	0.6%	0.5%	0.3%	0.9%
26 Other Ferrous	1.1%	0.9%	0.5%	1.6%
27 Other Non-Ferrous	0.2%	0.4%	<0.1%	0.4%
Total Metals	**4.6%**			
ORGANICS				
28 Textiles	6.6%	4.0%	4.3%	8.9%
29 Other Textiles	<0.1%	0.1%	<0.1%	0.1%
30 Leather	<0.1%	<0.1%	<0.1%	<0.1%
31 Food Waste	14.5%	3.7%	12.4%	16.6%
32 Treated Wood	<0.1%	<0.1%	<0.1%	<0.1%
33 Furniture	0.5%	1.6%	<0.1%	1.4%
34 Mattresses	<0.1%	<0.1%	<0.1%	<0.1%
35 Untreated Wood	1.0%	1.2%	0.3%	1.7%
36 Pallets	<0.1%	<0.1%	<0.1%	<0.1%
37 Yard Waste	1.1%	1.6%	0.2%	2.0%
38 Rubber	0.1%	0.3%	<0.1%	0.3%
39 Stumps	<0.1%	<0.1%	<0.1%	<0.1%
40 Other Organics	7.1%	2.0%	6.0%	8.2%
Total Organics	**31.0%**			

Exhibit 2. Waste Composition for Collection Center Compactors (continued)

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
GLASS				
41 Clear Glass Bottles/Jars	2.9%	2.2%	1.6%	4.1%
42 Green Glass Bottles/Jars	0.2%	0.4%	<0.1%	0.4%
43 Brown Glass Bottles/Jars	1.4%	1.7%	0.5%	2.4%
44 Ceramic Glass	0.3%	0.7%	<0.1%	0.6%
45 Other Glass	<0.1%	0.1%	<0.1%	<0.1%
Total Glass	**4.8%**			
ELECTRONICS				
46 Computers	<0.1%	<0.1%	<0.1%	<0.1%
47 Televisions	<0.1%	<0.1%	<0.1%	<0.1%
48 Handheld Devices	<0.1%	<0.1%	<0.1%	<0.1%
49 Printers, VCRs	<0.1%	<0.1%	<0.1%	<0.1%
50 DVD's/CDs	<0.1%	<0.1%	<0.1%	<0.1%
51 Printer Ink Cartridges	<0.1%	<0.1%	<0.1%	<0.1%
52 Microwaves	<0.1%	<0.1%	<0.1%	<0.1%
53 Small Appliances	0.5%	1.3%	<0.1%	1.2%
54 Other Electronics	0.5%	1.2%	<0.1%	1.1%
Total Electronics	**1.0%**			
Hazardous/Special Care				
55 HHW	<0.1%	<0.1%	<0.1%	<0.1%
56 CFLs	<0.1%	<0.1%	<0.1%	<0.1%
57 Oil Filters	0.3%	0.5%	<0.1%	0.6%
58 Dry Cell Batteries	<0.1%	0.2%	<0.1%	0.2%
59 Paint	<0.1%	<0.1%	<0.1%	<0.1%
60 Lead-Acid Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Total Hazardous/Special Care	**0.4%**			
C&D/Other Waste				
61 Infectious Waste	<0.1%	<0.1%	<0.1%	<0.1%
62 Diapers	3.3%	3.2%	1.5%	5.1%
63 Pet waste	<0.1%	<0.1%	<0.1%	<0.1%
64 Brick	<0.1%	0.3%	<0.1%	0.2%
65 Concrete	<0.1%	<0.1%	<0.1%	<0.1%
66 Drywall	<0.1%	0.2%	<0.1%	0.2%
67 Vinyl Siding	<0.1%	<0.1%	<0.1%	<0.1%
68 PVC Pipe	<0.1%	<0.1%	<0.1%	<0.1%
69 Roofing Shingles	0.1%	0.4%	<0.1%	0.3%
70 Other Building Materials	<0.1%	<0.1%	<0.1%	<0.1%
71 Fines	3.1%	1.4%	2.3%	3.9%
Total C&D/Other Wastes	**6.7%**			
TOTALS	**100.0%**			

Note: Composition based on 12 samples.

Exhibit 3. Waste Composition for Collection Center Compactors



Diversion Opportunities

A major objective of this study is quantifying the amounts of materials in the waste stream that could be recycled or composted**. Exhibit 5** portrays recycling opportunities graphically, highlighting potential recyclables, while **Exhibit 6** highlights potentially compostable wastes. In order to generate these graphics, assumptions were made as to which categories are considered compostable or recyclable. The categories designated as compostable or recyclable are listed in **Exhibit 4**. The actual potential for diversion activities such as recycling and composting depends on local markets and economic factors.

Exhibit 4. Recyclable and Compostable Categories

Recyclable Components of the Waste Stream		
Newspaper	Aluminum Cans	Handheld Devices
Glossy/Magazines	Aluminum Tin/Foil	Printers, VCRs
Rec Corr Cardboard	Aerosol Cans	Printer Ink Cartridges
Mixed Paper	Other Ferrous	Microwaves
Hardcover Books	Other Non-Ferrous	Small Appliances
Gable Top	Textiles	Other Electronics
Aseptic/Coated	Other Textiles	HHW
PET #1 Bottles	Mattresses	CFLs
PET Non bottle	Clear Glass Bottles/Jars	Oil Filters
HDPE Bottles	Green Glass Bottles/Jars	Dry Cell Batteries
Other Bottles	Brown Glass Bottles/Jars	Paint
Plastic Cups/Tubs	Computers	Lead-Acid Batteries
Rigid Plastics	Televisions	Roofing Shingles
Steel/Bi Metal Food		
Compostable Components of the Waste Stream		
Non-Rec Cardboard	Untreated Wood	Stumps
Paper Plates	Pallets	Pet waste
Other Paper	Yard Waste	Drywall
Food Waste		

Exhibit 5. Diversion Opportunities - Collection Center Compactors - Potential Recyclables

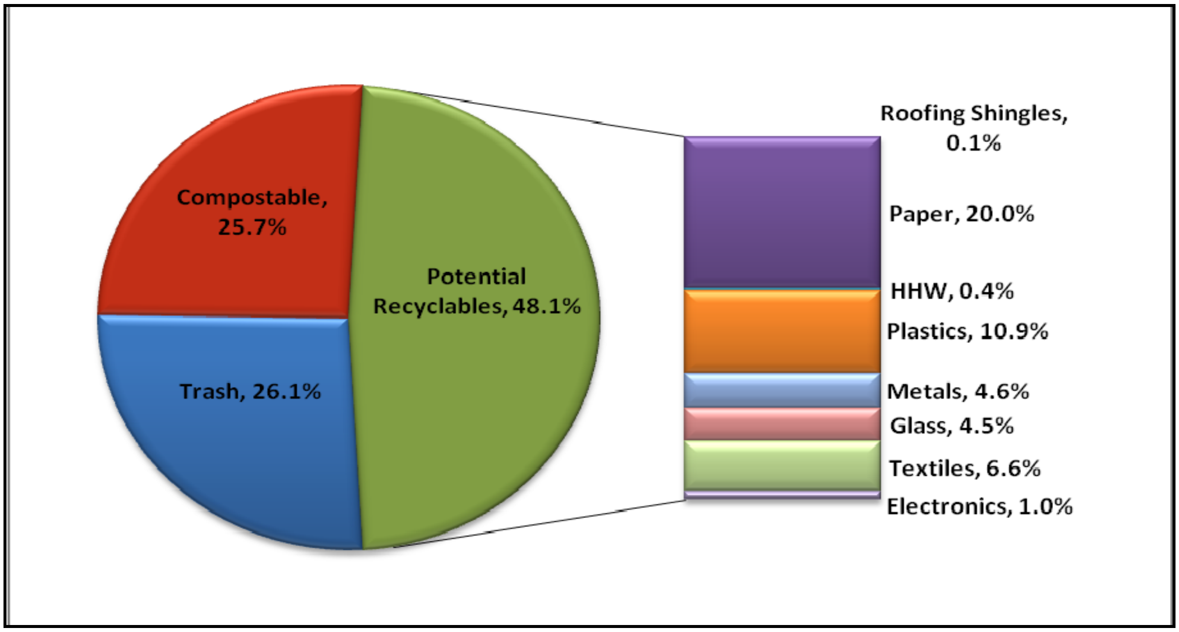
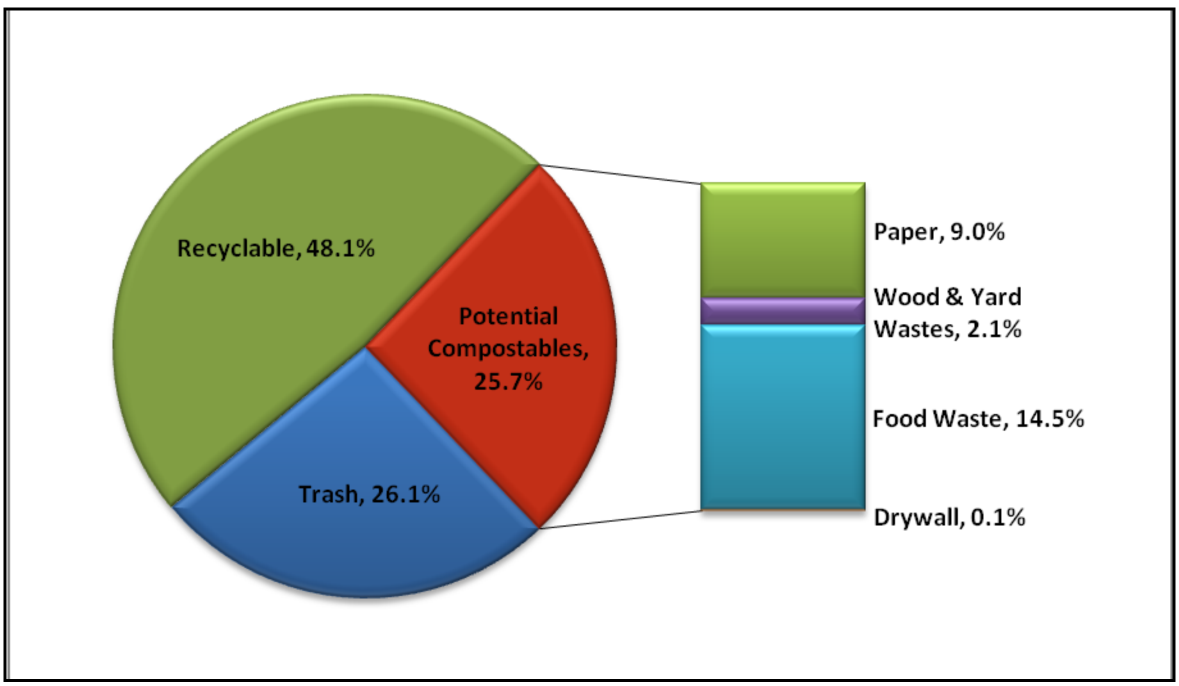


Exhibit 6. Diversion Opportunities - Collection Center Compactors - Potential Compostables



COLLECTION CENTER BULKY BINS

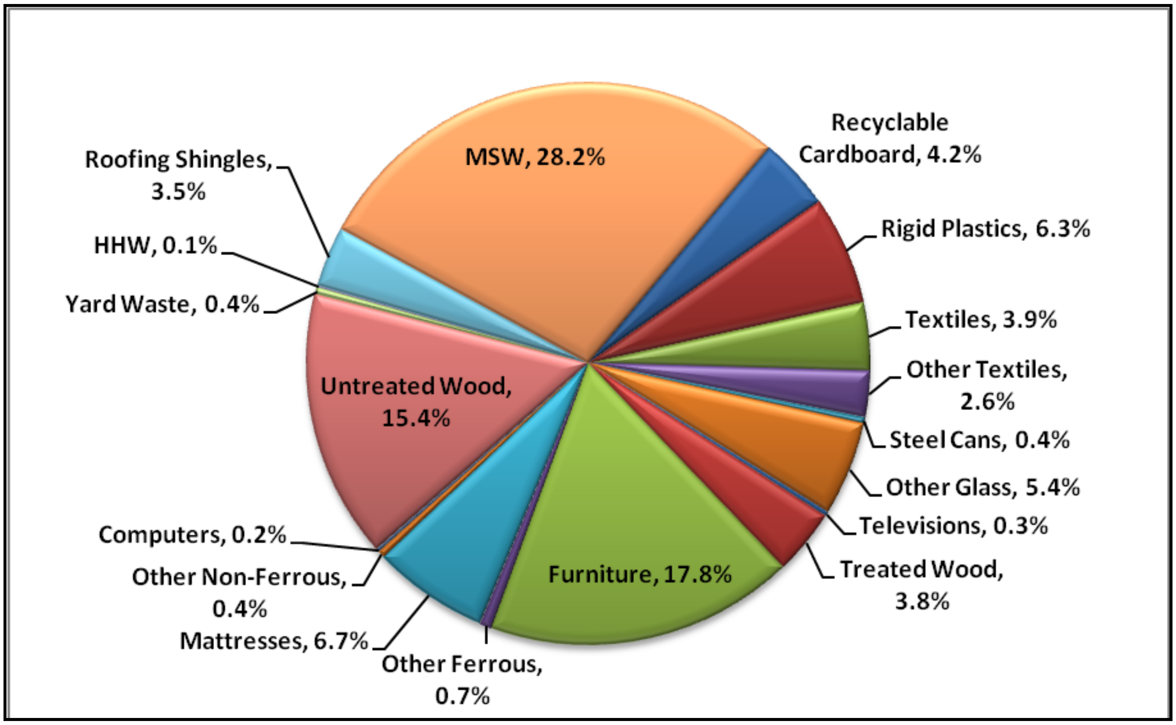
Exhibit 7 presents a compilation of the twelve bulky waste samples that were that were visually characterized. Each of the twelve collection centers are represented in this composition. Only subcomponents that were observed are presented, components that are not presented were not observed during the visual characterization. Based on these samples, the three largest subcomponents, by weight, are bagged MSW (28.2 percent), Furniture (17.8 percent), and Untreated Wood (15.4 percent). Because of the timing of the study, some of the compactors had reached capacity and residents used the bulky containers for overflow MSW. Bagged MSW may comprise a smaller proportion of waste disposed in the bulky bins during normal operation. Due to the high variability of these loads, the 95 percent confidence intervals are sometimes quite large. **Exhibit 8** presents the data graphically.

Exhibit 7. Waste Composition for Collection Center Bulky Bins

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	95% Confidence Limits Upper
Observed Components				
1 Recyclable Corrugated Cardboard	4.2%	5.6%	1.0%	7.3%
2 Rigid Plastics	6.3%	5.3%	3.3%	9.2%
3 Textiles	3.9%	8.8%	<0.1%	8.9%
4 Other Textiles	2.6%	5.8%	<0.1%	5.8%
5 Steel Cans	0.4%	1.4%	<0.1%	1.2%
6 Other Ferrous	0.7%	1.6%	<0.1%	1.6%
7 Other Non-Ferrous	0.4%	1.4%	<0.1%	1.2%
8 Other Glass	5.4%	18.8%	<0.1%	16.0%
9 Treated Wood	3.8%	6.4%	0.1%	7.4%
10 Furniture	17.8%	16.2%	8.6%	26.9%
11 Mattresses	6.7%	7.8%	2.3%	11.1%
12 Untreated Wood	15.4%	20.9%	3.6%	27.3%
13 Yard Waste	0.4%	1.4%	<0.1%	1.2%
14 Computers	0.2%	0.6%	<0.1%	0.5%
15 Televisions	0.3%	0.6%	<0.1%	0.6%
16 HHW	<0.1%	0.3%	<0.1%	0.2%
17 Roofing Shingles	3.5%	9.9%	<0.1%	9.1%
18 MSW	28.2%	25.1%	14.0%	42.4%
TOTALS	**100.0%**			

Note: Composition based on 12 samples.

Exhibit 8. Waste Composition for Collection Center Bulky Bins



COLLECTION CENTER PRE-CRUSHERS

Exhibit 9 presents a compilation of the two waste samples obtained and sorted from pre-crusher containers. Only two of the twelve collection centers use pre-crushers in addition to bulky bins. Based on these samples, the three largest subcomponents, by weight, are Treated Wood (20.0 percent), Untreated Wood (17.8 percent), and Other Organics (7.7 percent). Because of the timing of the study, some of the compactors had reached capacity and residents used the pre-crushers for MSW. Bagged MSW may comprise a smaller proportion of waste disposed in the pre-crushers during normal operation. Because there were only two samples characterized from pre-crushers, confidence intervals are not provided in the table. **Exhibit 10** portrays the major waste components graphically.

Exhibit 9. Waste Composition for Collection Center Pre-Crushers

Material Components		Mean Composition
PAPER		
1	Newspaper	3.1%
2	Glossy/Magazines	<0.1%
3	Rec Corr Cardboard	2.5%
4	Non-Rec Cardboard	<0.1%
5	Mixed Paper	5.9%
6	Hardcover Books	<0.1%
7	Gable Top	<0.1%
8	Aseptic/Coated	<0.1%
9	Paper Plates	0.3%
10	Other Paper	2.5%
	Total Paper	**14.3%**
PLASTIC		
11	PET #1 Bottles	1.6%
12	PET Non bottle	<0.1%
13	HDPE Bottles	0.4%
14	Other Bottles	<0.1%
15	Plastic Film	3.2%
16	AG Plastic Film	<0.1%
17	Plastic Cups/Tubs	0.2%
18	Polystyrene	0.5%
19	Rigid Plastics	2.5%
20	PP #5 Bags	<0.1%
21	Bottles that held toxics	0.4%
	Total Plastic	**8.8%**
METALS		
22	Steel/Bi Metal Food Cans	0.5%
23	Aluminum Cans	0.3%
24	Aluminum Tin/Foil	0.4%
25	Aerosol Cans	<0.1%
26	Other Ferrous	0.3%
27	Other Non-Ferrous	<0.1%
	Total Metals	**1.5%**
ORGANICS		
28	Textiles	2.2%
29	Other Textiles	<0.1%
30	Leather	0.5%
31	Food Waste	6.7%
32	Treated Wood	20.0%
33	Furniture	3.7%
34	Mattresses	<0.1%
35	Untreated Wood	17.8%
36	Pallets	<0.1%
37	Yard Waste	1.2%
38	Rubber	1.6%
39	Stumps	<0.1%
40	Other Organics	7.7%
	Total Organics	**61.4%**

Exhibit 9. Waste Composition for Collection Center Pre-Crushers (continued)

Material Components	Mean Composition
GLASS	
41 Clear Glass Bottles/Jars	0.4%
42 Green Glass Bottles/Jars	<0.1%
43 Brown Glass Bottles/Jars	<0.1%
44 Ceramic Glass	<0.1%
45 Other Glass	<0.1%
Total Glass	**0.4%**
ELECTRONICS	
46 Computers	1.5%
47 Televisions	<0.1%
48 Handheld Devices	<0.1%
49 Printers, VCRs	<0.1%
50 DVD's/CDs	<0.1%
51 Printer Ink Cartridges	<0.1%
52 Microwaves	<0.1%
53 Small Appliances	<0.1%
54 Other Electronics	<0.1%
Total Electronics	**1.5%**
Hazardous/Special Care	
55 HHW	<0.1%
56 CFLs	<0.1%
57 Oil Filters	0.2%
58 Dry Cell Batteries	<0.1%
59 Paint	<0.1%
60 Lead-Acid Batteries	<0.1%
Total Hazardous/Special Care	**0.2%**
C&D/Other Waste	
61 Infectious Waste	<0.1%
62 Diapers	4.1%
63 Pet waste	<0.1%
64 Brick	1.7%
65 Concrete	<0.1%
66 Drywall	<0.1%
67 Vinyl Siding	<0.1%
68 PVC Pipe	<0.1%
69 Roofing Shingles	1.7%
70 Other Building Materials	0.4%
71 Fines	3.9%
Total C&D/Other Wastes	**11.8%**
TOTALS	**100.0%**

Note: Composition based on 2 samples.

Exhibit 10. Waste Composition for Pre-Crushers