

# ***Contractor's Report to the Board***

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## ***Executive Summary and Excerpts***

*Targeted Statewide Waste Characterization Study:*

## ***Detailed Characterization of Commercial Self-Haul and Drop-Box Waste***

*June 2006*

***Produced under contract by:***

***Cascadia Consulting Group***



The complete study can be found on the Board's website at [www.ciwmb.ca.gov/Publications/default.asp?pubid=1179](http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1179)



# Executive Summary

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## ***Introduction***

In 2004, the CIWMB commissioned this study, which quantifies and characterizes four specific waste streams:

1. Disposal and diversion from specific major waste generators in the commercial sector (Task 1);
2. Residuals from materials recovery facilities and municipal solid waste processing facilities (clean and dirty MRFs) (Task 2);
3. Disposal from the construction and demolition (C&D) waste stream (Task 3); and
4. Disposal from the commercial self-haul and loose drop-box waste stream (Task 4).

This report presents the results of the analysis of the commercial self-haul and drop-box waste stream (Task 4). The objectives of this portion of the study were to develop reliable estimates of the quantity and composition of California's non-C&D commercial self-haul and loose drop-box waste stream.

In contrast to recent statewide studies the CIWMB commissioned in 1999 and 2003, this portion of the current study included only two waste sectors: commercial self-haul and loose drop-box, rather than the commercial, residential, and self-haul waste streams. Additionally, the current study focused on waste from four metropolitan areas of the state instead of the entire state.

## ***Study Methodology***

This portion of the study included waste from two sectors: commercial self-haul and loose drop-box waste. C&D waste was excluded because it was the focus of Task 3. Disposal facilities throughout four metropolitan areas were eligible for participation in the study: the San Diego area, Southern California/Los Angeles Basin, the San Francisco Bay Area, and the Central Valley. Sampling events were divided between the four areas across two seasons (December 2004 and June 2005), so that two sampling days were held in each area in each season. An additional weekend day of sampling was conducted in the L.A. Basin in the summer season to obtain weekend data.

Waste from 321 samples was hand-sorted into 74 material types as described in Appendix B. Approximately equal numbers of waste samples belonging to each sector were characterized in each metropolitan area.

Concurrent with waste sampling, vehicle surveys were conducted at participating facilities. Data from the surveys was analyzed to estimate the portion of each metropolitan area's waste that corresponds to each waste sector.

## ***Results***

Sampling data was compiled to generate composition estimates while the survey data was used to generate tonnage estimates and to compile overall results for each sector. Composition results were presented according to *divertibility*. Divertible material is defined as material for which technologies and markets exist in California to recover these materials from the waste stream, through recycling or composting. Material types were assigned to a divertibility class, based on available recycling technologies and markets (see Appendix B). The final report includes detailed findings for the following areas:

- Composition and tonnage by material and divertibility class for commercial self-haul waste and for drop-box waste for all four metropolitan areas combined.

- Composition and tonnage by material and divertibility class for commercial self-haul waste for each metropolitan area.
- Composition and tonnage by material and divertibility class drop-box waste for each metropolitan area.

The findings show that approximately 1,387,500 tons were disposed in 2004 for commercial self-haul waste in the four metropolitan areas compared to about 1,655,600 tons of drop-box waste (Table 1). For both waste sectors, most of the tons were disposed in the Bay Area. Slightly less, about 637,000 tons compared to 639,000 tons, were estimated to be disposed in the L.A. Basin for drop-box waste.

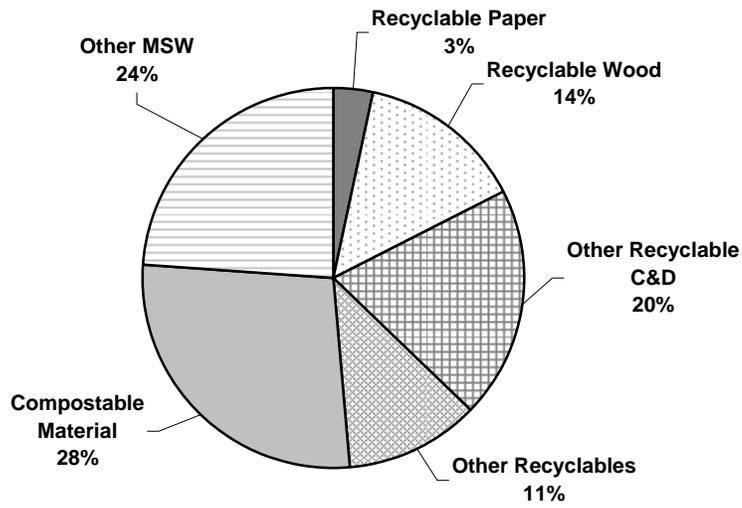
**Table 1. Metropolitan Area Annual Tonnages by Sector**

| Sector               | San Diego | San Francisco/<br>Bay Area | Southern California/<br>L.A. Basin | Central Valley | Total            |
|----------------------|-----------|----------------------------|------------------------------------|----------------|------------------|
| Commercial Self-haul | 306,266   | 713,660                    | 313,276                            | 54,317         | <b>1,387,519</b> |
| Drop-box             | 310,948   | 639,424                    | 636,526                            | 68,736         | <b>1,655,634</b> |

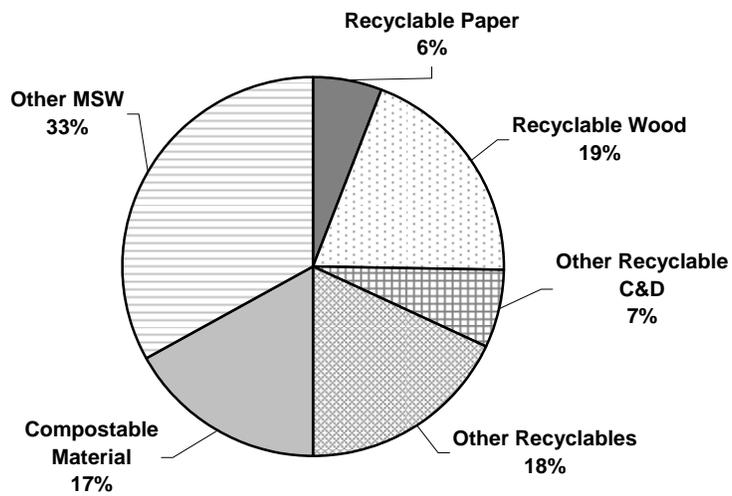
As displayed in Figure A and Figure B, the majority of waste in the commercial self-haul and drop-box sectors is divertible, about 76 percent and 67 percent, respectively. Compostable material (28 percent) was the most prominent divertible material type for overall self-haul waste. For drop-box waste, the largest divertibility class was recyclable wood at about 19 percent, followed by other recyclables (18 percent) and compostable material (17 percent) (Figure B). The most prominent individual material for both sectors was lumber, accounting for about 14 percent in self-haul waste and nearly 20 percent of drop-box waste. The Top Ten disposed materials for each sector can be found in Table 2 and Table 3. Detailed composition data for each sector can be found in Table 8 and Table 18.

A note on data for the *construction and demolition* material class: although this study excluded loads coming from construction and demolition activities, these **material types** are still present in the self-haul and drop-box waste streams. For example, the *lumber* material type includes pallets and wood scraps that a business might dispose in a drop-box. These materials were not generated by construction and demolition **activities**, but they fall under the *lumber* material type in the *construction and demolition* material class.

**Figure A. Overview of Waste Divertibility: Overall Self-haul, 2005**



**Figure B. Overview of Waste Divertibility: Overall Drop-box, 2005**



**Table 2. Top Ten Disposed Materials: Overall Commercial Self-haul, 2005**

| Material                      | Divertible | Est. Percent | Cum. Percent | Est. Tons        |
|-------------------------------|------------|--------------|--------------|------------------|
| Lumber                        | yes        | 14.1%        | 14.1%        | 195,066          |
| Leaves & Grass                | yes        | 12.0%        | 26.0%        | 166,218          |
| Rock, Soil, Fines             | yes        | 10.0%        | 36.0%        | 138,643          |
| Bulky Items                   | no         | 9.6%         | 45.6%        | 133,039          |
| Prunings & Trimmings          | yes        | 8.8%         | 54.4%        | 121,629          |
| Concrete                      | yes        | 7.5%         | 61.9%        | 104,339          |
| Branches & Stumps             | yes        | 6.4%         | 68.3%        | 89,239           |
| Other Ferrous Metal           | yes        | 6.4%         | 74.7%        | 88,972           |
| Treated Wood Waste            | no         | 4.1%         | 78.9%        | 56,934           |
| Uncoated Corrugated Cardboard | yes        | 3.0%         | 81.8%        | 41,210           |
| <b>Total</b>                  |            | <b>81.8%</b> |              | <b>1,135,289</b> |

The figures, when added together, may not exactly match the totals shown, due to rounding.

**Table 3. Top Ten Disposed Materials: Overall Loose Drop-box, 2005**

| Material                      | Divertible | Est. Percent | Cum. Percent | Est. Tons        |
|-------------------------------|------------|--------------|--------------|------------------|
| Lumber                        | yes        | 19.3%        | 19.3%        | 319,247          |
| Bulky Items                   | no         | 8.3%         | 27.6%        | 136,938          |
| Treated Wood Waste            | no         | 5.7%         | 33.3%        | 94,686           |
| Prunings & Trimmings          | yes        | 5.3%         | 38.6%        | 87,569           |
| Uncoated Corrugated Cardboard | yes        | 5.0%         | 43.5%        | 82,504           |
| Leaves & Grass                | yes        | 4.6%         | 48.2%        | 76,940           |
| Food                          | yes        | 4.5%         | 52.7%        | 75,314           |
| Other Ferrous Metal           | yes        | 4.1%         | 56.9%        | 68,421           |
| Remainder/Composite C&D       | no         | 3.9%         | 60.8%        | 64,269           |
| Rock, Soil, Fines             | yes        | 3.8%         | 64.6%        | 63,045           |
| <b>Total</b>                  |            | <b>64.6%</b> |              | <b>1,068,932</b> |

The figures, when added together, may not exactly match the totals shown, due to rounding.

# EXCERPTS

**Table 8. Detailed Waste Composition: Overall Commercial Self-haul, 2005**

| Material                                 | Est. Percent | + / - | Est. Tons      | Material                             | Est. Percent  | + / - | Est. Tons        |
|--|--------------|-------|----------------|--------------------------------------|---------------|-------|------------------|
| <b>Paper</b>                             | <b>5.8%</b>  |       | <b>81,122</b>  | <b>Organic</b>                       | <b>30.6%</b>  |       | <b>424,875</b>   |
| Uncoated Corrugated Cardboard            | 3.0%         | 1.6%  | 41,210         | Food                                 | 0.2%          | 0.2%  | 2,873            |
| Paper Bags/Kraft                         | 0.2%         | 0.2%  | 2,113          | Leaves & Grass                       | 12.0%         | 4.3%  | 166,218          |
| Newspaper                                | 0.1%         | 0.1%  | 1,020          | Prunings & Trimmings                 | 8.8%          | 2.5%  | 121,629          |
| White Ledger                             | 0.0%         | 0.0%  | 228            | Branches & Stumps                    | 6.4%          | 2.6%  | 89,239           |
| Colored Ledger                           | 0.0%         | 0.0%  | 30             | Agricultural Crop                    | 0.0%          | 0.0%  | 0                |
| Computer Paper                           | 0.0%         | 0.0%  | 159            | Manures                              | 0.0%          | 0.0%  | 0                |
| Other Office Paper                       | 0.0%         | 0.0%  | 26             | Textiles                             | 0.6%          | 0.5%  | 8,755            |
| Magazines/Catalogs                       | 0.1%         | 0.2%  | 2,081          | Carpet                               | 1.2%          | 0.8%  | 15,988           |
| Phone Books/Directories                  | 0.0%         | 0.0%  | 0              | Remainder/Composite Organics         | 1.5%          | 1.2%  | 20,172           |
| Other Misc. Paper                        | 1.3%         | 1.2%  | 17,704         |                                      |               |       |                  |
| Remainder/Composite Paper                | 1.2%         | 0.9%  | 16,551         | <b>Construction &amp; Demolition</b> | <b>40.5%</b>  |       | <b>561,837</b>   |
| <b>Glass</b>                             | <b>0.2%</b>  |       | <b>2,565</b>   | Concrete                             | 7.5%          | 4.8%  | 104,339          |
| Clear Glass Bottles & Containers         | 0.0%         | 0.0%  | 39             | Asphalt Paving                       | 0.0%          | 0.0%  | 0                |
| Green Glass Bottles & Containers         | 0.0%         | 0.0%  | 53             | Asphalt Roofing                      | 0.6%          | 0.6%  | 7,999            |
| Brown Glass Bottles & Containers         | 0.0%         | 0.0%  | 98             | Lumber                               | 14.1%         | 4.2%  | 195,066          |
| Other Colored Glass Bottles & Containers | 0.0%         | 0.0%  | 0              | Treated Wood Waste                   | 4.1%          | 2.2%  | 56,934           |
| Flat Glass                               | 0.0%         | 0.0%  | 0              | Gypsum Board                         | 2.2%          | 1.6%  | 30,162           |
| Remainder/Composite Glass                | 0.2%         | 0.2%  | 2,375          | Rock, Soil, Fines                    | 10.0%         | 3.7%  | 138,643          |
| <b>Metal</b>                             | <b>8.5%</b>  |       | <b>117,771</b> | Remainder/Composite C&D              | 2.1%          | 0.8%  | 28,694           |
| Tin/Steel Cans                           | 0.1%         | 0.1%  | 1,029          | <b>Household Hazardous Waste</b>     | <b>0.1%</b>   |       | <b>1,208</b>     |
| Major Appliances                         | 0.0%         | 0.1%  | 525            | Paint                                | 0.0%          | 0.0%  | 0                |
| Used Oil Filters                         | 0.0%         | 0.0%  | 0              | Vehicle & Equip. Fluids              | 0.0%          | 0.0%  | 0                |
| Other Ferrous                            | 6.4%         | 3.1%  | 88,972         | Used Oil                             | 0.0%          | 0.0%  | 0                |
| Aluminum Cans                            | 0.0%         | 0.0%  | 65             | Batteries                            | 0.0%          | 0.0%  | 0                |
| Other Non-Ferrous                        | 0.1%         | 0.1%  | 949            | Remainder/Composite HHW              | 0.1%          | 0.1%  | 1,208            |
| Remainder/Composite Metal                | 1.9%         | 1.1%  | 26,231         | <b>Special Waste</b>                 | <b>9.9%</b>   |       | <b>137,349</b>   |
| <b>Electronics</b>                       | <b>0.3%</b>  |       | <b>4,198</b>   | Ash                                  | 0.0%          | 0.0%  | 0                |
| Brown Goods                              | 0.0%         | 0.0%  | 345            | Sewage Solids                        | 0.0%          | 0.0%  | 0                |
| Computer-related Electronics             | 0.3%         | 0.4%  | 3,789          | Industrial Sludge                    | 0.0%          | 0.0%  | 0                |
| Other Small Consumer Electronics         | 0.0%         | 0.0%  | 64             | Treated Medical Waste                | 0.0%          | 0.0%  | 0                |
| TV's & Other CRTs                        | 0.0%         | 0.0%  | 0              | Bulky Items                          | 9.6%          | 3.5%  | 133,039          |
| <b>Plastic</b>                           | <b>4.1%</b>  |       | <b>56,594</b>  | Tires                                | 0.3%          | 0.5%  | 4,310            |
| PETE Bottles                             | 0.0%         | 0.0%  | 56             | Remainder/Composite Special Waste    | 0.0%          | 0.0%  | 0                |
| Other PETE Containers                    | 0.0%         | 0.0%  | 3              | <b>Mixed Residue</b>                 | <b>0.0%</b>   |       | <b>0</b>         |
| HDPE Natural Bottles                     | 0.0%         | 0.0%  | 21             | Mixed Residue                        | 0             | 0.0%  | 0                |
| HDPE Colored Bottles                     | 0.0%         | 0.0%  | 61             |                                      |               |       |                  |
| HDPE 5-gallon buckets - Food             | 0.1%         | 0.1%  | 931            | <b>Totals</b>                        | <b>100.0%</b> |       | <b>1,387,519</b> |
| HDPE 5-gallon buckets - Non-food         | 0.0%         | 0.0%  | 409            | <b>Sample count:</b>                 | <b>160</b>    |       |                  |
| Other HDPE Containers                    | 0.2%         | 0.2%  | 2,822          |                                      |               |       |                  |
| #3-#7 Bottles                            | 0.1%         | 0.2%  | 1,790          |                                      |               |       |                  |
| #3-#7 Other Containers                   | 0.3%         | 0.4%  | 3,549          |                                      |               |       |                  |
| Plastic Trash Bags                       | 0.1%         | 0.1%  | 886            |                                      |               |       |                  |
| Grocery/Merch. Bags                      | 0.1%         | 0.2%  | 1,691          |                                      |               |       |                  |
| Non-Bag Comm./Ind. Packaging Film        | 0.4%         | 0.3%  | 5,300          |                                      |               |       |                  |
| Film Products                            | 0.0%         | 0.0%  | 113            |                                      |               |       |                  |
| Other Film                               | 0.0%         | 0.0%  | 307            |                                      |               |       |                  |
| Durable Plastic Items                    | 1.7%         | 0.9%  | 23,686         |                                      |               |       |                  |
| Remainder/Composite Plastic              | 1.1%         | 0.7%  | 14,968         |                                      |               |       |                  |

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

**Table 18. Detailed Waste Composition: Overall Loose Drop-box, 2005**

| <b>Material</b>                          | <b>Est. Percent</b> | <b>+ / -</b> | <b>Est. Tons</b> | <b>Material</b>                      | <b>Est. Percent</b> | <b>+ / -</b> | <b>Est. Tons</b> |
|--|---------------------|--------------|------------------|--------------------------------------|---------------------|--------------|------------------|
| <b>Paper</b>                             | <b>10.5%</b>        |              | <b>173,670</b>   | <b>Organic</b>                       | <b>22.6%</b>        |              | <b>373,480</b>   |
| Uncoated Corrugated Cardboard            | 5.0%                | 1.7%         | 82,504           | Food                                 | 4.5%                | 2.7%         | 75,314           |
| Paper Bags/Kraft                         | 0.2%                | 0.2%         | 3,064            | Leaves & Grass                       | 4.6%                | 2.8%         | 76,940           |
| Newspaper                                | 0.2%                | 0.1%         | 3,563            | Prunings & Trimmings                 | 5.3%                | 2.4%         | 87,569           |
| White Ledger                             | 0.1%                | 0.1%         | 1,259            | Branches & Stumps                    | 2.3%                | 1.3%         | 38,143           |
| Colored Ledger                           | 0.0%                | 0.0%         | 469              | Agricultural Crop                    | 0.0%                | 0.0%         | 0                |
| Computer Paper                           | 0.0%                | 0.0%         | 225              | Manures                              | 0.0%                | 0.0%         | 0                |
| Other Office Paper                       | 0.2%                | 0.3%         | 3,758            | Textiles                             | 0.9%                | 0.5%         | 14,466           |
| Magazines/Catalogs                       | 0.2%                | 0.3%         | 3,653            | Carpet                               | 2.8%                | 1.4%         | 46,441           |
| Phone Books/Directories                  | 0.0%                | 0.0%         | 0                | Remainder/Composite Organics         | 2.1%                | 1.0%         | 34,608           |
| Other Misc. Paper                        | 2.7%                | 2.0%         | 45,362           |                                      |                     |              |                  |
| Remainder/Composite Paper                | 1.8%                | 1.1%         | 29,812           | <b>Construction &amp; Demolition</b> | <b>35.9%</b>        |              | <b>594,297</b>   |
| <b>Glass</b>                             | <b>1.5%</b>         |              | <b>24,045</b>    | Concrete                             | 1.4%                | 0.7%         | 22,406           |
| Clear Glass Bottles & Containers         | 0.1%                | 0.1%         | 1,066            | Asphalt Paving                       | 0.0%                | 0.0%         | 0                |
| Green Glass Bottles & Containers         | 0.0%                | 0.0%         | 432              | Asphalt Roofing                      | 0.2%                | 0.2%         | 2,658            |
| Brown Glass Bottles & Containers         | 0.0%                | 0.0%         | 54               | Lumber                               | 19.3%               | 3.6%         | 319,247          |
| Other Colored Glass Bottles & Containers | 0.0%                | 0.0%         | 0                | Treated Wood Waste                   | 5.7%                | 1.8%         | 94,686           |
| Flat Glass                               | 0.9%                | 1.1%         | 14,427           | Gypsum Board                         | 1.7%                | 1.0%         | 27,986           |
| Remainder/Composite Glass                | 0.5%                | 0.7%         | 8,066            | Rock, Soil, Fines                    | 3.8%                | 2.2%         | 63,045           |
| <b>Metal</b>                             | <b>10.1%</b>        |              | <b>167,345</b>   | Remainder/Composite C&D              | 3.9%                | 2.0%         | 64,269           |
| Tin/Steel Cans                           | 0.1%                | 0.0%         | 916              | <b>Household Hazardous Waste</b>     | <b>0.2%</b>         |              | <b>2,500</b>     |
| Major Appliances                         | 1.8%                | 1.4%         | 29,406           | Paint                                | 0.1%                | 0.1%         | 952              |
| Used Oil Filters                         | 0.0%                | 0.0%         | 0                | Vehicle & Equip. Fluids              | 0.0%                | 0.0%         | 0                |
| Other Ferrous                            | 4.1%                | 1.2%         | 68,421           | Used Oil                             | 0.0%                | 0.0%         | 0                |
| Aluminum Cans                            | 0.0%                | 0.0%         | 268              | Batteries                            | 0.0%                | 0.0%         | 0                |
| Other Non-Ferrous                        | 0.4%                | 0.4%         | 6,897            | Remainder/Composite HHW              | 0.1%                | 0.1%         | 1,549            |
| Remainder/Composite Metal                | 3.7%                | 1.5%         | 61,437           | <b>Special Waste</b>                 | <b>9.3%</b>         |              | <b>153,576</b>   |
| <b>Electronics</b>                       | <b>0.4%</b>         |              | <b>6,356</b>     | Ash                                  | 0.1%                | 0.1%         | 1,305            |
| Brown Goods                              | 0.1%                | 0.2%         | 2,250            | Sewage Solids                        | 0.0%                | 0.0%         | 0                |
| Computer-related Electronics             | 0.1%                | 0.1%         | 1,216            | Industrial Sludge                    | 0.0%                | 0.0%         | 0                |
| Other Small Consumer Electronics         | 0.0%                | 0.0%         | 103              | Treated Medical Waste                | 0.0%                | 0.0%         | 0                |
| TV's & Other CRTs                        | 0.2%                | 0.2%         | 2,788            | Bulky Items                          | 8.3%                | 3.1%         | 136,938          |
| <b>Plastic</b>                           | <b>9.7%</b>         |              | <b>160,365</b>   | Tires                                | 0.9%                | 0.8%         | 14,555           |
| PETE Bottles                             | 0.0%                | 0.0%         | 463              | Remainder/Composite Special Waste    | 0.0%                | 0.1%         | 778              |
| Other PETE Containers                    | 0.0%                | 0.0%         | 4                | <b>Mixed Residue</b>                 | <b>0.0%</b>         |              | <b>0</b>         |
| HDPE Natural Bottles                     | 0.0%                | 0.0%         | 326              | Mixed Residue                        | 0                   | 0.0%         | 0                |
| HDPE Colored Bottles                     | 0.0%                | 0.0%         | 292              |                                      |                     |              |                  |
| HDPE 5-gallon buckets - Food             | 0.1%                | 0.1%         | 1,209            |                                      |                     |              |                  |
| HDPE 5-gallon buckets - Non-food         | 0.1%                | 0.1%         | 1,396            |                                      |                     |              |                  |
| Other HDPE Containers                    | 0.1%                | 0.1%         | 1,080            |                                      |                     |              |                  |
| #3-#7 Bottles                            | 0.0%                | 0.1%         | 674              |                                      |                     |              |                  |
| #3-#7 Other Containers                   | 0.1%                | 0.1%         | 1,779            |                                      |                     |              |                  |
| Plastic Trash Bags                       | 0.1%                | 0.1%         | 1,772            |                                      |                     |              |                  |
| Grocery/Merch. Bags                      | 0.0%                | 0.0%         | 140              |                                      |                     |              |                  |
| Non-Bag Comm./Ind. Packaging Film        | 0.5%                | 0.4%         | 8,029            |                                      |                     |              |                  |
| Film Products                            | 2.8%                | 2.3%         | 46,126           |                                      |                     |              |                  |
| Other Film                               | 0.5%                | 0.7%         | 8,690            |                                      |                     |              |                  |
| Durable Plastic Items                    | 3.7%                | 2.2%         | 60,614           |                                      |                     |              |                  |
| Remainder/Composite Plastic              | 1.7%                | 0.9%         | 27,772           |                                      |                     |              |                  |
|  |                     |              |                  | <b>Totals</b>                        | <b>100.0%</b>       |              | <b>1,655,634</b> |
|  |                     |              |                  | <b>Sample count:</b>                 | <b>161</b>          |              |                  |

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.