City and Borough of Juneau Waste Characterization Study

FINAL Report September 2024

CASCADIA CONSULTING GROUP

Submitted by Cascadia Consulting Group, Inc.

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Project Background

The community of Juneau, Alaska, has a unique solid waste management situation for a city of its size. The City and Borough of Juneau (CBJ) lacks "flow control" over the community's waste; CBJ neither owns the only landfill, which is expected to reach capacity in the next 10-15 years, nor does it manage the public utility for waste hauling. Recognizing the consequences of the limited life left in the landfill, the Juneau Assembly, the local governing body, identified solid waste planning with an emphasis on zero waste as a priority. In 2023, CBJ contracted with Cascadia Consulting Group (Cascadia) to perform a waste characterization study to accomplish the following objectives:

- Establish baseline data on Juneau's solid waste generation
- Inform the creation of future diversion/reduction programs and policies by identifying and quantifying waste streams
- Assist with the City and Borough of Juneau's solid waste planning efforts

This waste characterization study provides critical data for determining Juneau's future solid waste disposal and diversion options. The results of this report will further inform a forthcoming CBJ study considering the feasibility of CBJ pursuing one of the following options: a) building a new landfill, b) building a waste-to-energy (WTE) facility, or c) building a transfer station to ship all waste south to the Lower 48. CBJ's ultimate goal is to gain a level of control over Juneau's municipal solid waste in order to provide transparency and public input into decisions affecting waste disposal.

Summary of Findings

In 2023, the Juneau community collected a combined 22,346 tons of material in the overall commercial, residential, and self-haul disposed waste streams. Of that material, 81% (18,013 tons) was recoverable: 18% (4,025 tons) was recyclable, 32% (7,083 tons) was compostable, 22% (4,998 tons) was potentially recoverable through specialty diversion programs, and 9% (1,907 tons) was reusable (Figure 1). The remaining 19% (4,333 tons) was non-recoverable.

Figure 1 and Table 1 below show the topline summary of recoverability and tons by sector (commercial, residential, and self-haul), respectively.

Figure 1. Tons by Recoverability: Overall Disposed Waste

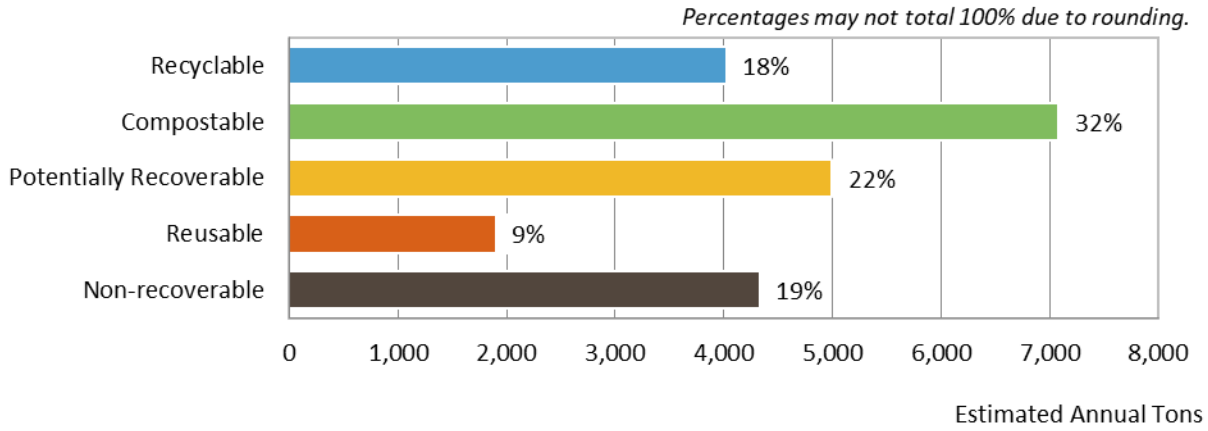


Table 1. Disposed Waste Tons by Sector, 2023

Sector	2023 Disposed Waste Tonnage
Overall Commercial	11,388
Commercial Packer	*6,029*
Commercial Roll-off	*5,360*
Residential	7,985
Self-haul	2,973
Overall Disposed Waste	**22,346**

Summary of Methodology

This section of the report provides a summary of project methodology. The detailed project methodology is included in Appendix A: Detailed Study Design.

Study Universe

This study included four distinct sectors and two subsectors. A "sector" or "subsector" is a unique portion of the total disposed waste stream and is determined by its specific generation, collection, or composition characteristics. The sectors and subsectors are:

- **Commercial waste -** Materials collected by Alaska Waste (AW) that the driver identifies as containing waste primarily from sources other than single-family residences. This sector includes some multifamily waste.
  - **Commercial packer waste -** Materials collected by AW in packer(compactor) trucks.
  - **Commercial roll-off waste -** Materials collected by AW in open-top or compacted roll-off containers.
- **Residential waste -** Materials collected by AW in packer trucks that the driver identifies as collected along a primarily single-family residential route. This sector may include minimal quantities of multifamily waste where multifamily properties have cart service.
- **Self-haul waste -** Material that is generated at residences, businesses, or institutions and is hauled by the household or business that generated the waste or by other non-franchised haulers (like a contractor, landscaper, or junk removal service).

All customers delivering municipal solid waste (MSW) or construction and demolition (C&D) debris to Capitol Landfill were eligible for sampling. For the purposes of this study, C&D debris is defined as the materials typically used in the construction of a structure or civil project (roads and bridges) such as concrete, wood, and roofing. MSW includes everything else the landfill accepts for disposal that is not C&D. Loads of recycling, yard debris, aggregates, and soil set aside for beneficial use and household hazardous waste (HHW) were not sampled and are therefore excluded from the study. Loads of disaster debris (for example, storm deadfall and soil) were not sampled.

Sample Allocations

Cascadia completed the field work Monday May 20 through Saturday May 25, 2024, at the Capitol Landfill in Juneau. The field crew planned to characterize 80 samples and actually characterized 76 samples. Sample targets were not met for the commercial roll-off sector due to fewer loads of material than expected on sampling days. Table 2 summarizes the planned and actual sample counts.

Table 2. Planned and Actual Samples by Sector

Sector	Planned Samples	Actual Samples
Overall Commercial	**30**	**26**
Commercial Packer	***15***	***15***
Commercial Roll-off	***15***	***11***
Residential	**20**	**20**
Self-Haul	**30**	**30**
Total	**80**	**76**

Sample Collection and Sorting

A Vehicle Surveyor served as the designated "gatekeeper" responsible for surveying, counting, and selecting vehicles for the study. During each field day, the Vehicle Surveyor used the Cascadia-developed Vehicle Survey Sheet and Vehicle Selection Sheet to track incoming eligible vehicles and flag randomly selected vehicles for sampling. When a selected commercial packer, compacted commercial roll-off, or residential packer vehicle arrived at the study area, the Sort Crew Lead and Facility Loader Operator worked together to collect an approximately 200-pound sample from a randomly selected portion of the load. The Field Team hand-sorted samples from these sectors into 54 unique material types (see Appendix A: Detailed Study Design).

The Surveyor directed selected open-top commercial roll-off and self-haul vehicles to the sampling area of the landfill's tip area. The Field Crew visually characterized these selected loads into the same 54 material types. Cascadia then applied material-specific density factors to the visual characterization data to convert sample volumes into sample weights. Each entire load was considered one sample for the open-top commercial roll-off and self-haul sectors.

Residential, commercial packer, and compacted commercial roll-off samples were hand sorted while open-top commercial roll-off and self-haul loads were visually characterized. The hand sort and visual characterization methods are detailed in Appendix A: Detailed Study Design.

Table 3 summarizes sample descriptive statistics for each sector.

Table 3. Sample Descriptive Statistics

Sector and Methodology	Min. Sample Weight (lbs.)	Max. Sample Weight (lbs.)	Avg. Sample Weight (lbs.)
Commercial (hand sorts)	**194**	**246**	**208**
Commercial (visual characterizations)	**610**	**2,292**	**1,458**
Residential (hand sorts)	**161**	**229**	**202**
Self-haul (visual characterizations)	**22**	**6,327**	**1,380**

Results

This section presents annual composition estimates applied to the annual tons of material in Juneau's disposed waste stream, as reported by Capitol Landfill and Alaska Waste for the 2023 calendar year (Table 4).

Table 4. Disposed Waste Tons by Sector, 2023

Sector	2023 Disposed Waste Tonnage
Overall Commercial	11,388
Commercial Packer	*6,029*
Commercial Roll-off	*5,360*
Residential	7,985
Self-haul	2,973
Overall Disposed Waste	**22,346**

Interpreting the Results

Composition estimates are presented as percentages and tons for each material type, material class, and recoverability group. Material types are classified by their recoverability to identify potential diversion opportunities in the disposed waste stream. CBJ and Cascadia categorized the materials into five groups, defined below, based on currently available recovery programs, technologies, and markets:

- **Recyclable** materials are typically accepted in a curbside recycling collection program.
- **Compostable** materials are readily accepted in a curbside organics collection program.
- **Potentially recoverable** materials can be recovered through specialty diversion programs but are not currently accepted in typical curbside recycling or organics collection programs.
- **Reusable** bulky materials are intended to be used more than once and appear to still be in usable condition.
- **Non-recoverable** materials are not readily recyclable or compostable through CBJ curbside collection or through specialty recycling programs.

Composition results for the overall disposed waste stream and for each sector are presented in five ways:

1. An overview of waste composition by recoverability group is presented in a bar chart.
2. An overview of waste composition by material class is presented in a bar chart.
3. The five most prevalent individual material types are presented in a table.

4. Composition estimates for categories of recyclable materials (e.g., cardboard, plastic packaging, glass) are presented in a table. Refer to Appendix B: Material List for details about which materials are included in each category.
5. Detailed composition results for all material types are presented in a table. The detailed composition table includes the mean composition along with the 90% confidence interval.

Each detailed composition table presents the mean composition of each material class and material type by weight, including the 90% confidence interval for each. Confidence intervals are omitted from the recyclable materials table because of how materials are grouped.

Table 5 illustrates how to interpret the 90% confidence interval. In this example, the best estimate of the amount of *aluminum cans* present in the sampling stratum is 7.3%. The figure 0.7% reflects the precision of the estimate. When calculations are performed at the 90% confidence level, we are 90% certain that the true amount of *aluminum cans* is between 7.3% plus 0.7% and 7.3% minus 0.7%. In other words, we are 90% certain that the mean lies between 8.0% and 6.6%. See Appendix C: Estimating Waste Composition for more information about composition calculations.

Table 5. Waste Composition Estimate Example

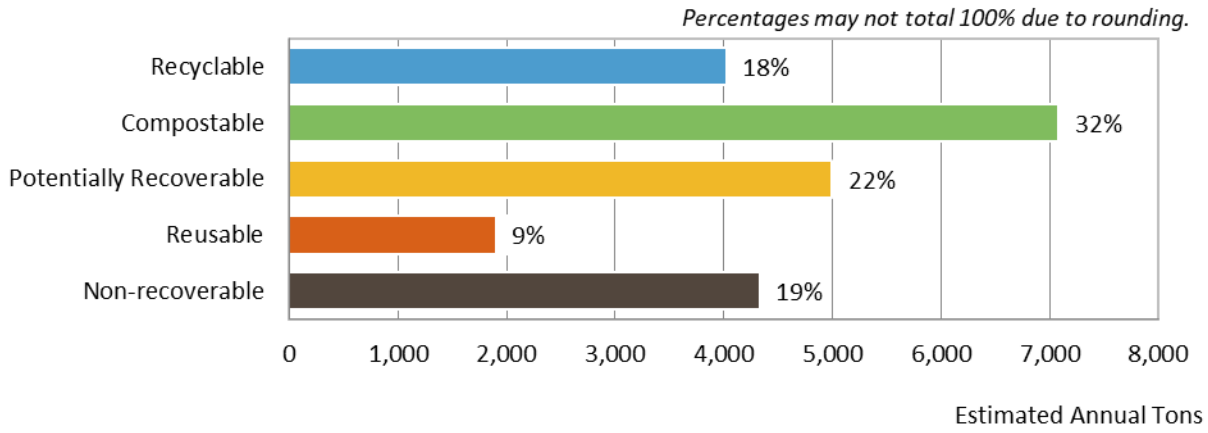
Material Type	Estimated Percent	+ / -
Aluminum Cans	7.3%	0.7%

To keep the waste composition tables and figures readable, estimated annual tonnages are rounded to the nearest ton and estimated percentages are rounded to the nearest percent or tenth of a percent. Numbers in the text use the same rounding as the figure or table being referenced. **Percentages less than 0.05% are shown as 0.0%. True zeros in tables are displayed as a dash ("–")**. Using the rounded percentages to calculate tonnages or sums may yield results that differ from the numbers shown in the report. All weight estimates report units of tons per year unless otherwise noted.

Overall Disposed Waste

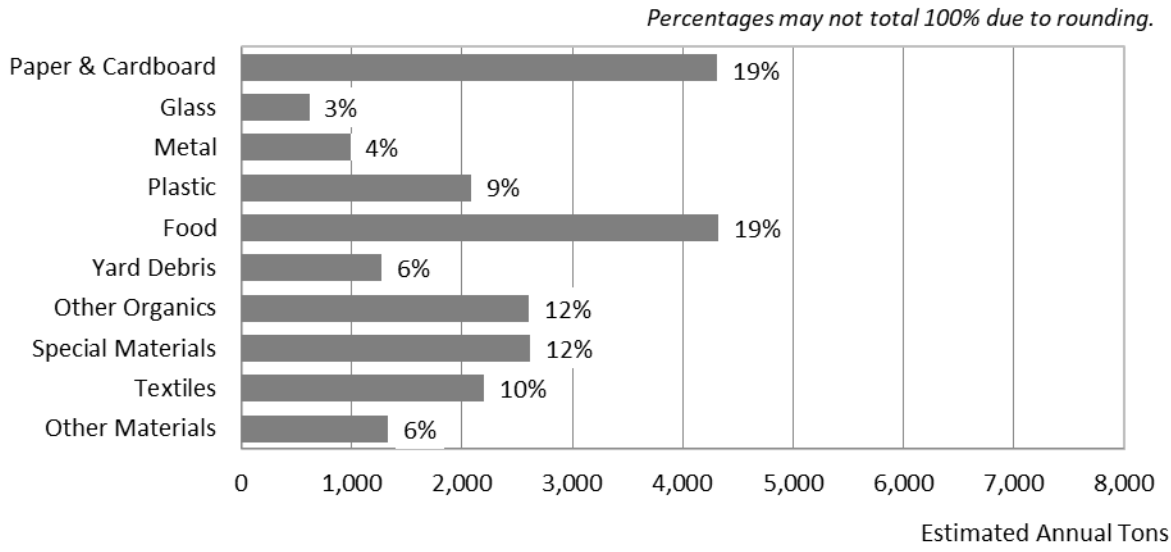
In 2023, the City and Borough of Juneau disposed of 22,346 tons of material at the Capitol Landfill. Of that material, 81% (18,013 tons) was recoverable: 18% (4,025 tons) was recyclable, 32% (7,083 tons) was compostable, 22% (4,998 tons) was potentially recoverable through specialty diversion programs, and 9% (1,907 tons) was reusable (Figure 2). The remaining 19% (4,333 tons) was non-recoverable.

Figure 2. Tons by Recoverability: Overall Disposed Waste



Paper and cardboard and food materials each accounted for 19% of the disposed waste stream (4,312 tons and 4,324 tons, respectively; Figure 3). Glass materials accounted for the smallest proportion of the stream (3% or 617 tons).

Figure 3. Tons by Material Class: Overall Disposed Waste



Textiles - synthetic, mixed, and unknown was the most prevalent recoverable material type in the disposed waste stream, accounting for 9.7% (2,169 tons) of material (Table 6). *Reusable clean wood* was the most prevalent reusable material type, accounting for 6.5% (1,459 tons) of the stream. *Food - packaged edible* was the most prevalent compostable material, accounting for 6.1% (1,356 tons) of the stream.

Table 6. Five Most Prevalent Recoverable Materials: Overall Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons
Textiles - Synthetic, Mixed, & Unknown	9.7%	4.3%	2,169
Reusable Clean Wood	6.5%	5.3%	1,459
Other Inert Construction Debris	6.1%	2.6%	1,370
Food - Packaged Edible	6.1%	1.3%	1,356
Food Soiled/Compostable Paper	5.8%	1.0%	1,298
Total for Five Most Prevalent Materials	**34.2%**		**7,652**
All Other Materials	**65.8%**		**14,694**
Total Annual Tons	**100.0%**		**22,346**

Of the recyclable materials present in the disposed waste stream, *typically recyclable paper* was the most prevalent (5.5% or 1,225 tons), followed by *uncoated corrugated cardboard* (4.4% or 992 tons) and *glass bottles and containers* (2.4% or 545 tons; Table 7).

Table 7. Recyclable Material Composition Table: Overall Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	Est. Tons
Typically Recyclable Paper	5.5%	1,225
Uncoated Corrugated Cardboard	4.4%	992
Glass Bottles & Containers	2.4%	545
Recyclable Plastic Packaging	2.3%	512
Other Recyclable Metal	2.1%	465
Tin/Steel Cans	0.6%	145
Aluminum Cans	0.6%	142
Total	**18.0%**	**4,025**

Textiles - synthetic, mixed, and unknown was also the most prevalent material type overall in the disposed waste stream (Table 8). *Single-layer plastic film* was the most prevalent non-recoverable material (3.9% or 865 tons).

Table 8. Detailed Composition Table: Overall Disposed Waste

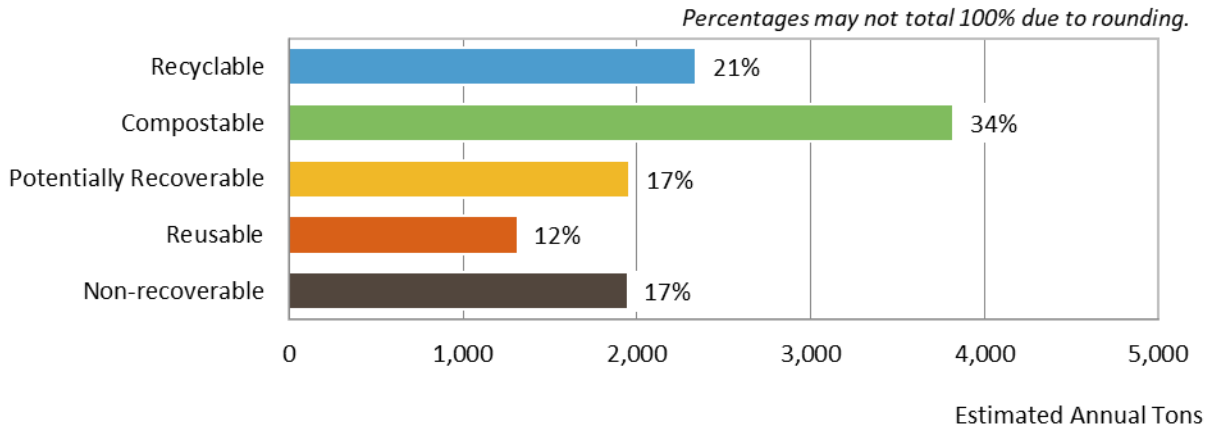
Confidence intervals calculated at the 90% confidence level. Percentages and tons for subtotals are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	**18.0%**	**2.8%**	**4,025**	**Food**	**19.4%**	**4.2%**	**4,324**
Compostable	**31.7%**	**6.6%**	**7,083**	Food - Packaged Edible	6.1%	1.3%	1,356
Potentially Recoverable	**22.4%**	**5.2%**	**4,998**	Food - Packaged Inedible	3.8%	4.1%	853
Reusable	**8.5%**	**5.2%**	**1,907**	Food - Unpackaged Edible	3.6%	1.2%	804
Non-recoverable	**19.4%**	**2.5%**	**4,333**	Food - Unpackaged Inedible	5.3%	1.7%	1,183
Paper & Cardboard	**19.3%**	**3.6%**	**4,312**	Beverages	0.6%	0.1%	128
Uncoated Corrugated Cardboard	4.4%	1.4%	992	**Yard Debris**	**5.7%**	**1.3%**	**1,267**
Typically Recyclable Paper	5.5%	2.3%	1,225	Leaves & Grass	4.0%	1.1%	893
Food Soiled/Compostable Paper	5.8%	1.0%	1,298	Woody Yard Debris	1.7%	1.1%	374
Non-recyclable or Non-compostable Paper	3.6%	1.1%	796	**Other Organics**	**11.7%**	**5.4%**	**2,610**
Plastic	**9.3%**	**1.2%**	**2,084**	Manures	-	-	-
#1 PET Rigid Plastic Packaging	1.0%	0.1%	234	Remainder/Composite Organic - Compostable	0.8%	0.4%	187
#2 HDPE Rigid Plastic Packaging	0.6%	0.1%	123	Other Clean Wood	1.4%	1.0%	316
#4 LDPE Rigid Plastic Packaging	0.0%	0.0%	4	Reusable Clean Wood	6.5%	5.3%	1,459
#5 PP Rigid Plastic Packaging	0.7%	0.2%	150	Remainder/Composite Organic - Non-compostable	2.9%	0.9%	649
Compostable Rigid Plastic Packaging	0.0%	0.0%	5	**Special Materials**	**11.7%**	**2.9%**	**2,615**
Compostable Plastic Single Use Food Service Ware	0.0%	0.0%	2	Other Inert Construction Debris	6.1%	2.6%	1,370
Other Rigid Plastic Packaging	0.4%	0.1%	97	Carpet	1.5%	1.6%	333
Other Durable Rigid Plastic Items	0.4%	0.1%	91	E-waste	0.7%	0.3%	148
Reusable Durable Rigid Plastic Items	1.4%	0.8%	304	Tires	0.6%	0.6%	134
Non-compostable Plastic Single Use Food Service War	0.1%	0.0%	14	Refrigerant-containing Items	0.1%	0.1%	19
Single-layer Plastic Film	3.9%	0.5%	865	Mattresses	0.0%	0.0%	0
Multi-layer Plastic Film	0.3%	0.0%	62	Broken Metal Furniture	1.0%	0.6%	219
Durable Film Plastic Items	0.0%	0.0%	0	Household Hazardous Waste	0.3%	0.2%	69
Remainder/Composite Plastic	0.6%	0.3%	131	Reusable Inert Construction Debris	0.3%	0.4%	74
Metal	**4.4%**	**1.0%**	**988**	Reusable Wood Furniture	0.3%	0.3%	70
Tin/Steel Cans	0.6%	0.2%	145	Reusable Metal Furniture	0.0%	0.0%	0
Aluminum Cans	0.6%	0.1%	142	Special Waste	0.5%	0.4%	122
Other Ferrous	1.7%	0.8%	370	Broken Wood Furniture	0.3%	0.2%	56
Other Non-ferrous	0.4%	0.1%	95	**Textiles**	**9.9%**	**4.3%**	**2,202**
Remainder/Composite Metal	1.1%	0.6%	236	Textiles - Organic	0.1%	0.1%	33
Glass	**2.8%**	**0.6%**	**617**	Textiles - Synthetic, Mixed, & Unknown	9.7%	4.3%	2,169
Glass Bottles & Containers	2.4%	0.5%	545	**Other Materials**	**5.9%**	**0.9%**	**1,328**
Remainder/Composite Glass	0.3%	0.3%	72	Fines	2.8%	0.5%	621
				Mixed Residue	3.2%	0.7%	707
Sample Count	*76*			**Total**	**100%**		**22,346**

Overall Commercial Disposed Waste

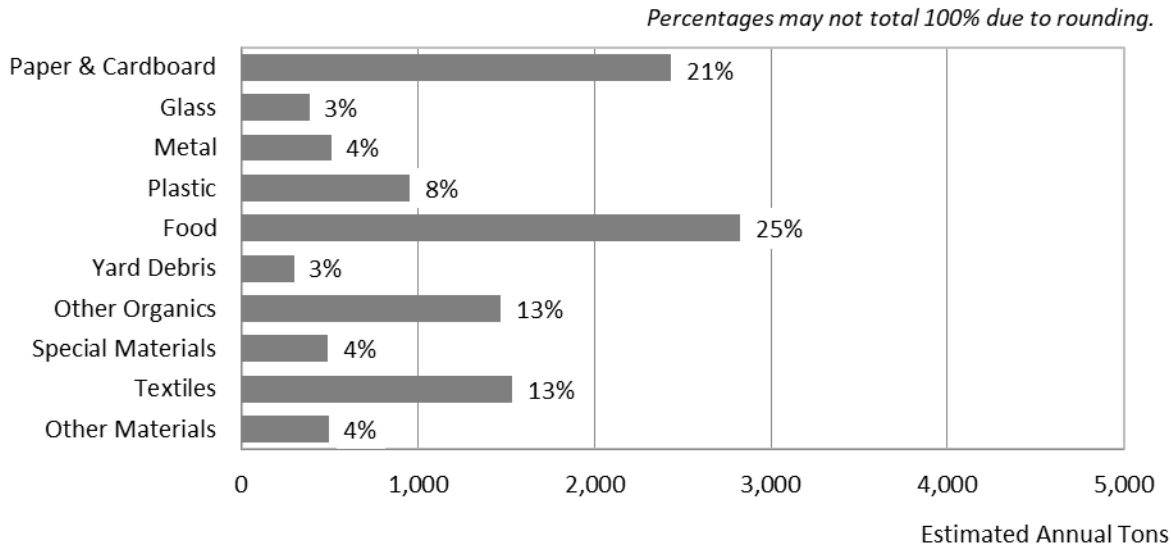
In 2023, Alaska Waste collected 11,388 tons of material in the commercial disposed waste stream. Of that material, 83% (9,442 tons) was recoverable: 21% (2,343 tons) was recyclable, 34% (3,823 tons) was compostable, 17% (1,959 tons) was potentially recoverable through specialty diversion programs, and 12% (1,316 tons) was reusable (Figure 4). The remaining 17% (1,946 tons) was non-recoverable.

Figure 4. Tons by Recoverability: Overall Commercial Disposed Waste



Food was the most prevalent material class in the commercial disposed waste stream, accounting for 25% (2,826 tons) of material (Figure 5). Glass and yard debris materials both accounted for the smallest proportion, or 3%, of the stream (384 and 298 tons, respectively).

Figure 5. Tons by Material Class: Overall Commercial Disposed Waste



Textiles - synthetic, mixed, and unknown was the most prevalent recoverable material type in the commercial disposed waste stream, accounting for 13.4% (1,521 tons) of material (Table 9). *Reusable clean wood* was the most prevalent reusable material type, accounting for 9.8% (1,113 tons) of the stream. *Food - packaged inedible* was the most prevalent compostable material, accounting for 7.2% (824 tons) of the stream. *Typically recyclable paper* was the most prevalent recyclable material, accounting for 5.9% (676 tons) of the stream.

Table 9. Five Most Prevalent Recoverable Materials: Overall Commercial Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons
Textiles - Synthetic, Mixed, & Unknown	13.4%	8.3%	1,521
Reusable Clean Wood	9.8%	10.2%	1,113
Food - Packaged Inedible	7.2%	8.0%	824
Food - Packaged Edible	6.2%	2.5%	707
Typically Recyclable Paper	5.9%	4.3%	676
Total for Five Most Prevalent Materials	**42.5%**		**4,840**
All Other Materials	**57.5%**		**6,548**
Total Annual Tons	**100.0%**		**11,388**

After *typically recyclable paper*, *uncoated corrugated cardboard* was the most prevalent recyclable material in the commercial disposed waste stream (5.8% or 662 tons; Table 10).

Table 10. Recyclable Material Composition Table: Overall Commercial Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	Est. Tons
Typically Recyclable Paper	5.9%	676
Uncoated Corrugated Cardboard	5.8%	662
Glass Bottles & Containers	3.3%	372
Other Recyclable Metal	2.3%	265
Recyclable Plastic Packaging	2.2%	246
Tin/Steel Cans	0.6%	65
Aluminum Cans	0.5%	56
Total	**20.6%**	**2,343**

Textiles - synthetic, mixed, and unknown was also the most prevalent material type overall in the commercial disposed waste stream (Table 11). *Non-recyclable or non-compostable paper* was the most prevalent non-recoverable material (3.9% or 448 tons).

Table 11. Detailed Composition Table: Overall Commercial Disposed Waste

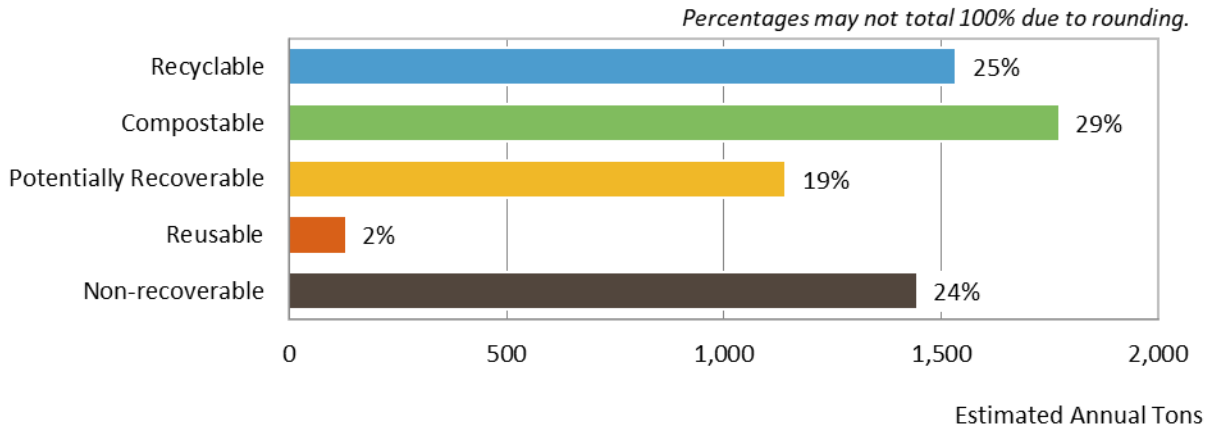
Confidence intervals calculated at the 90% confidence level. Percentages and tons for subtotals are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	**20.6%**	**4.8%**	**2,343**	**Food**	**24.8%**	**7.6%**	**2,826**
Compostable	**33.6%**	**12.3%**	**3,823**	Food - Packaged Edible	6.2%	2.5%	707
Potentially Recoverable	**17.2%**	**7.9%**	**1,959**	Food - Packaged Inedible	7.2%	8.0%	824
Reusable	**11.6%**	**9.9%**	**1,316**	Food - Unpackaged Edible	5.1%	2.1%	585
Non-recoverable	**17.1%**	**3.8%**	**1,946**	Food - Unpackaged Inedible	5.6%	1.5%	643
Paper & Cardboard	**21.3%**	**6.2%**	**2,430**	Beverages	0.6%	0.2%	67
Uncoated Corrugated Cardboard	5.8%	2.5%	662	**Yard Debris**	**2.6%**	**1.4%**	**298**
Typically Recyclable Paper	5.9%	4.3%	676	Leaves & Grass	1.6%	0.9%	180
Food Soiled/Compostable Paper	5.7%	1.7%	644	Woody Yard Debris	1.0%	1.1%	118
Non-recyclable or Non-compostable Paper	3.9%	2.0%	448	**Other Organics**	**12.9%**	**10.1%**	**1,471**
Plastic	**8.4%**	**1.8%**	**952**	Manures	-	-	-
#1 PET Rigid Plastic Packaging	0.9%	0.2%	100	Remainder/Composite Organic - Compostable	0.5%	0.4%	53
#2 HDPE Rigid Plastic Packaging	0.5%	0.2%	54	Other Clean Wood	0.5%	0.5%	57
#4 LDPE Rigid Plastic Packaging	-	-	-	Reusable Clean Wood	9.8%	10.2%	1,113
#5 PP Rigid Plastic Packaging	0.8%	0.4%	92	Remainder/Composite Organic - Non-compostable	2.2%	1.3%	248
Compostable Rigid Plastic Packaging	0.0%	0.0%	1	**Special Materials**	**4.3%**	**1.7%**	**490**
Compostable Plastic Single Use Food Service Ware	0.0%	0.0%	1	Other Inert Construction Debris	1.1%	0.8%	125
Other Rigid Plastic Packaging	0.3%	0.1%	39	Carpet	-	-	-
Other Durable Rigid Plastic Items	0.4%	0.2%	47	E-waste	0.5%	0.3%	52
Reusable Durable Rigid Plastic Items	1.2%	1.2%	132	Tires	0.0%	0.0%	1
Non-compostable Plastic Single Use Food Service Wari	0.1%	0.0%	8	Refrigerant-containing Items	-	-	-
Single-layer Plastic Film	3.6%	0.8%	408	Mattresses	-	-	-
Multi-layer Plastic Film	0.2%	0.1%	23	Broken Metal Furniture	0.6%	0.4%	69
Durable Film Plastic Items	-	-	-	Household Hazardous Waste	0.3%	0.2%	33
Remainder/Composite Plastic	0.4%	0.1%	47	Reusable Inert Construction Debris	0.1%	0.2%	12
Metal	**4.5%**	**1.5%**	**508**	Reusable Wood Furniture	0.5%	0.6%	59
Tin/Steel Cans	0.6%	0.3%	65	Reusable Metal Furniture	-	-	-
Aluminum Cans	0.5%	0.1%	56	Special Waste	1.0%	0.8%	110
Other Ferrous	2.0%	1.2%	224	Broken Wood Furniture	0.2%	0.2%	27
Other Non-ferrous	0.4%	0.2%	41	**Textiles**	**13.5%**	**8.3%**	**1,535**
Remainder/Composite Metal	1.1%	0.7%	121	Textiles - Organic	0.1%	0.1%	15
Glass	**3.4%**	**1.0%**	**384**	Textiles - Synthetic, Mixed, & Unknown	13.4%	8.3%	1,521
Glass Bottles & Containers	3.3%	1.0%	372	**Other Materials**	**4.3%**	**1.1%**	**493**
Remainder/Composite Glass	0.1%	0.1%	12	Fines	2.0%	0.6%	229
				Mixed Residue	2.3%	0.7%	264
Sample Count	*26*			**Total**	**100%**		**11,388**

Commercial Packer Disposed Waste

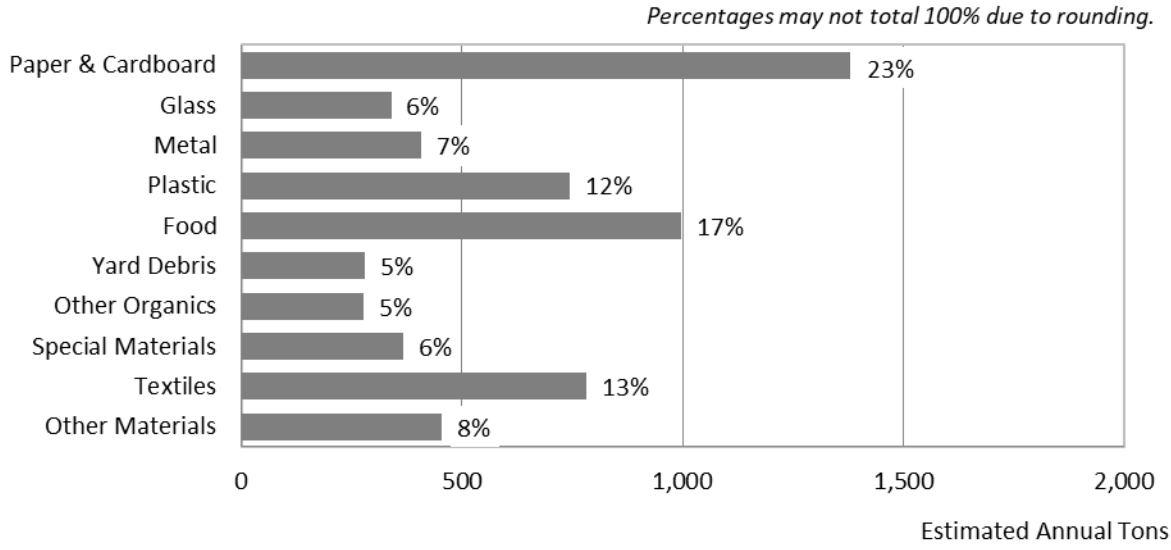
In 2023, Alaska Waste collected 6,029 tons of material in the commercial packer disposed waste stream. Of that material, 76% (4,583 tons) was recoverable: 25% (1,535 tons) was recyclable, 29% (1,773 tons) was compostable, 19% (1,144 tons) was potentially recoverable through specialty diversion programs, and 2% (132 tons) was reusable (Figure 6). The remaining 24% (1,445 tons) was non-recoverable.

Figure 6. Tons by Recoverability: Commercial Packer Disposed Waste



Paper and cardboard was the most prevalent material class in the commercial packer disposed waste stream, accounting for 23% (1,381 tons) of material (Figure 7). Yard debris and other organics materials both accounted for the smallest proportion, or 5%, of the stream (281 and 276 tons, respectively).

Figure 7. Tons by Material Class: Commercial Packer Disposed Waste



Textiles - synthetic, mixed, and unknown was the most prevalent recoverable material type in the commercial packer disposed waste stream, accounting for 12.7% (767 tons) of material (Table 12). *Food soiled/compostable paper* was the most prevalent compostable material type, accounting for 7.4% (445 tons) of the stream. *Uncoated corrugated cardboard* was the most prevalent recyclable material type, accounting for 6.9% (417 tons) of the stream.

Table 12. Five Most Prevalent Recoverable Materials: Commercial Packer Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons
Textiles - Synthetic, Mixed, & Unknown	12.7%	5.3%	767
Food Soiled/Compostable Paper	7.4%	1.7%	445
Uncoated Corrugated Cardboard	6.9%	3.5%	417
Food - Packaged Edible	6.5%	1.3%	390
Glass Bottles & Containers	5.5%	1.7%	331
Total for Five Most Prevalent Materials	**39.0%**		**2,351**
All Other Materials	**61.0%**		**3,678**
Total Annual Tons	**100.0%**		**6,029**

After *uncoated corrugated cardboard*, *glass bottles and containers* was the most prevalent recyclable material in the commercial packer disposed waste stream (5.5% or 331 tons; Table 13).

Table 13. Recyclable Material Composition Table: Commercial Packer Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	Est. Tons
Uncoated Corrugated Cardboard	6.9%	417
Glass Bottles & Containers	5.5%	331
Typically Recyclable Paper	5.1%	305
Other Recyclable Metal	3.3%	202
Recyclable Plastic Packaging	3.1%	186
Aluminum Cans	0.8%	48
Tin/Steel Cans	0.8%	46
Total	**25.5%**	**1,535**

Textiles - synthetic, mixed, and unknown was also the most prevalent material type overall in the commercial packer disposed waste stream (Table 14). *Single-layer plastic film* was the most prevalent non-recoverable material (5.0% or 302 tons).

Table 14. Detailed Composition Table: Commercial Packer Disposed Waste

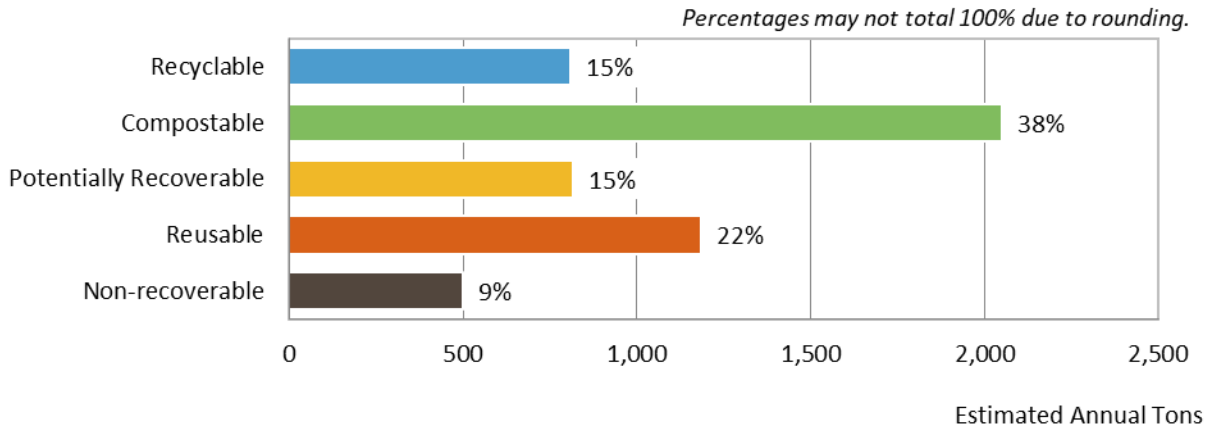
Confidence intervals calculated at the 90% confidence level. Percentages and tons for subtotals are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	**25.5%**	**5.7%**	**1,535**	**Food**	**16.5%**	**3.2%**	**997**
Compostable	**29.4%**	**4.0%**	**1,773**	Food - Packaged Edible	6.5%	1.3%	390
Potentially Recoverable	**19.0%**	**5.2%**	**1,144**	Food - Packaged Inedible	0.5%	0.2%	27
Reusable	**2.2%**	**2.2%**	**132**	Food - Unpackaged Edible	4.4%	2.8%	266
Non-recoverable	**24.0%**	**3.4%**	**1,445**	Food - Unpackaged Inedible	4.5%	1.0%	270
Paper & Cardboard	**22.9%**	**5.4%**	**1,381**	Beverages	0.7%	0.2%	44
Uncoated Corrugated Cardboard	6.9%	3.5%	417	**Yard Debris**	**4.7%**	**2.6%**	**281**
Typically Recyclable Paper	5.1%	2.0%	305	Leaves & Grass	2.7%	1.6%	164
Food Soiled/Compostable Paper	7.4%	1.7%	445	Woody Yard Debris	1.9%	2.1%	116
Non-recyclable or Non-compostable Paper	3.5%	0.9%	214	**Other Organics**	**4.6%**	**2.2%**	**276**
Plastic	**12.3%**	**2.7%**	**743**	Manures	-	-	-
#1 PET Rigid Plastic Packaging	1.3%	0.4%	81	Remainder/Composite Organic - Compostable	0.8%	0.7%	48
#2 HDPE Rigid Plastic Packaging	0.6%	0.2%	36	Other Clean Wood	0.9%	0.9%	55
#4 LDPE Rigid Plastic Packaging	-	-	-	Reusable Clean Wood	-	-	-
#5 PP Rigid Plastic Packaging	1.1%	0.6%	69	Remainder/Composite Organic - Non-compostable	2.9%	1.7%	173
Compostable Rigid Plastic Packaging	0.0%	0.0%	1	**Special Materials**	**6.1%**	**2.3%**	**367**
Compostable Plastic Single Use Food Service Ware	0.0%	0.0%	0	Other Inert Construction Debris	1.4%	1.3%	85
Other Rigid Plastic Packaging	0.4%	0.1%	27	Carpet	-	-	-
Other Durable Rigid Plastic Items	0.7%	0.3%	42	E-waste	0.9%	0.5%	52
Reusable Durable Rigid Plastic Items	2.0%	2.2%	119	Tires	-	-	-
Non-compostable Plastic Single Use Food Service War	0.1%	0.0%	5	Refrigerant-containing Items	-	-	-
Single-layer Plastic Film	5.0%	0.6%	302	Mattresses	-	-	-
Multi-layer Plastic Film	0.3%	0.1%	18	Broken Metal Furniture	1.1%	0.8%	69
Durable Film Plastic Items	-	-	-	Household Hazardous Waste	0.5%	0.4%	32
Remainder/Composite Plastic	0.7%	0.3%	43	Reusable Inert Construction Debris	0.2%	0.3%	12
Metal	**6.8%**	**2.7%**	**407**	Reusable Wood Furniture	-	-	-
Tin/Steel Cans	0.8%	0.2%	46	Reusable Metal Furniture	-	-	-
Aluminum Cans	0.8%	0.2%	48	Special Waste	1.8%	1.5%	110
Other Ferrous	2.7%	2.1%	164	Broken Wood Furniture	0.1%	0.1%	6
Other Non-ferrous	0.6%	0.4%	38	**Textiles**	**13.0%**	**5.4%**	**782**
Remainder/Composite Metal	1.9%	1.3%	112	Textiles - Organic	0.2%	0.2%	15
Glass	**5.6%**	**1.8%**	**340**	Textiles - Synthetic, Mixed, & Unknown	12.7%	5.3%	767
Glass Bottles & Containers	5.5%	1.7%	331	**Other Materials**	**7.5%**	**2.0%**	**455**
Remainder/Composite Glass	0.1%	0.1%	8	Fines	3.4%	1.1%	206
				Mixed Residue	4.1%	1.2%	249
Sample Count	*15*			**Total**	**100%**		**6,029**

Commercial Roll-off Disposed Waste

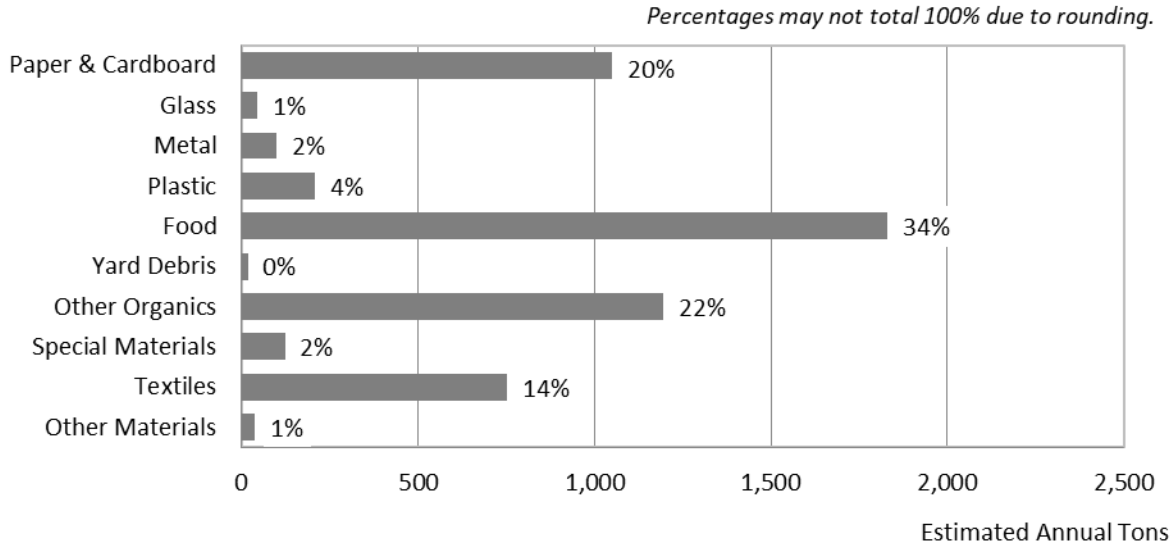
In 2023, Alaska Waste collected 5,360 tons of material in the commercial roll-off disposed waste stream. Of that material, 91% (4,859 tons) was recoverable: 15% (808 tons) was recyclable, 38% (2,051 tons) was compostable, 15% (816 tons) was potentially recoverable through specialty diversion programs, and 22% (1,185 tons) was reusable (Figure 8). The remaining 9% (501 tons) was non-recoverable.

Figure 8. Tons by Recoverability: Commercial Roll-off Disposed Waste



Food was the most prevalent material class in the commercial roll-off disposed waste stream, accounting for 34% (1,829 tons) of material (Figure 9). The next two most prevalent material classes were other organics (22% or 1,195 tons) and paper and cardboard (20% or 1,049 tons).

Figure 9. Tons by Material Class: Commercial Roll-off Disposed Waste



Reusable clean wood was the most prevalent recoverable material type in the commercial roll-off disposed waste stream, accounting for 20.8% (1,113 tons) of material (Table 15). *Food - packaged inedible* was the most prevalent compostable material type, accounting for 14.9% (797 tons) of the stream. *Textiles - synthetic, mixed, and unknown* was the most prevalent potentially recoverable material type, accounting for 14.1% (754 tons) of the material stream. *Typically recyclable paper* was the most prevalent recyclable material type, accounting for 6.9% (370 tons) of the stream.

Table 15. Five Most Prevalent Recoverable Materials: Commercial Roll-off Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons
Reusable Clean Wood	20.8%	21.7%	1,113
Food - Packaged Inedible	14.9%	16.9%	797
Textiles - Synthetic, Mixed, & Unknown	14.1%	16.5%	754
Food - Unpackaged Inedible	7.0%	3.0%	374
Typically Recyclable Paper	6.9%	8.9%	370
Total for Five Most Prevalent Materials	**63.6%**		**3,408**
All Other Materials	**36.4%**		**1,952**
Total Annual Tons	**100.0%**		**5,360**

After *typically recyclable paper*, *uncoated corrugated cardboard* was the most prevalent recyclable materials in the commercial roll-off disposed waste stream (4.6% or 246 tons; Table 16).

Table 16. Recyclable Material Composition Table: Commercial Roll-off Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	Est. Tons
Typically Recyclable Paper	6.9%	370
Uncoated Corrugated Cardboard	4.6%	246
Other Recyclable Metal	1.2%	64
Recyclable Plastic Packaging	1.1%	60
Glass Bottles & Containers	0.8%	41
Tin/Steel Cans	0.4%	19
Aluminum Cans	0.1%	8
Total	**15.1%**	**808**

Reusable clean wood was also the most prevalent material type overall in the commercial roll-off disposed waste stream (Table 17). *Non-recyclable or non-compostable paper* was the most prevalent non-recoverable material (4.4% or 235 tons).

Table 17. Detailed Composition Table: Commercial Roll-off Disposed Waste

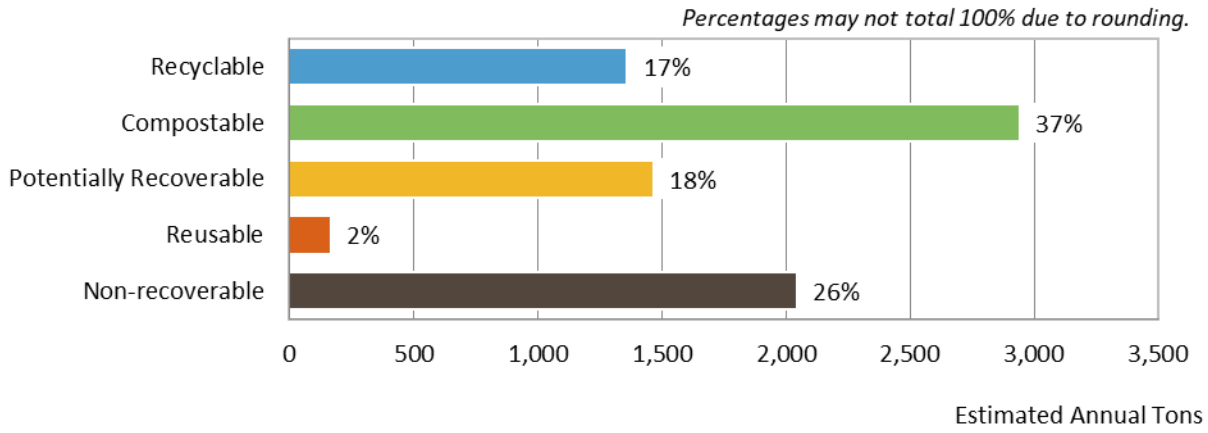
Confidence intervals calculated at the 90% confidence level. Percentages and tons for subtotals are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	**15.1%**	**8.0%**	**808**	**Food**	**34.1%**	**15.7%**	**1,829**
Compostable	**38.3%**	**25.7%**	**2,051**	Food - Packaged Edible	5.9%	5.1%	316
Potentially Recoverable	**15.2%**	**15.8%**	**816**	Food - Packaged Inedible	14.9%	16.9%	797
Reusable	**22.1%**	**20.8%**	**1,185**	Food - Unpackaged Edible	6.0%	3.3%	319
Non-recoverable	**9.3%**	**7.2%**	**501**	Food - Unpackaged Inedible	7.0%	3.0%	374
Paper & Cardboard	**19.6%**	**11.8%**	**1,049**	Beverages	0.4%	0.4%	24
Uncoated Corrugated Cardboard	4.6%	3.5%	246	**Yard Debris**	**0.3%**	**0.5%**	**18**
Typically Recyclable Paper	6.9%	8.9%	370	Leaves & Grass	0.3%	0.5%	16
Food Soiled/Compostable Paper	3.7%	3.1%	199	Woody Yard Debris	0.0%	0.0%	1
Non-recyclable or Non-compostable Paper	4.4%	4.1%	235	**Other Organics**	**22.3%**	**21.4%**	**1,195**
Plastic	**3.9%**	**2.4%**	**209**	Manures	-	-	-
#1 PET Rigid Plastic Packaging	0.4%	0.3%	19	Remainder/Composite Organic - Compostable	0.1%	0.1%	5
#2 HDPE Rigid Plastic Packaging	0.3%	0.2%	18	Other Clean Wood	0.0%	0.0%	2
#4 LDPE Rigid Plastic Packaging	-	-	-	Reusable Clean Wood	20.8%	21.7%	1,113
#5 PP Rigid Plastic Packaging	0.4%	0.4%	23	Remainder/Composite Organic - Non-compostable	1.4%	1.8%	75
Compostable Rigid Plastic Packaging	0.0%	0.0%	0	**Special Materials**	**2.3%**	**2.5%**	**123**
Compostable Plastic Single Use Food Service Ware	0.0%	0.0%	1	Other Inert Construction Debris	0.7%	0.7%	40
Other Rigid Plastic Packaging	0.2%	0.2%	12	Carpet	-	-	-
Other Durable Rigid Plastic Items	0.1%	0.1%	6	E-waste	0.0%	0.0%	1
Reusable Durable Rigid Plastic Items	0.2%	0.4%	12	Tires	0.0%	0.0%	1
Non-compostable Plastic Single Use Food Service War	0.1%	0.0%	3	Refrigerant-containing Items	-	-	-
Single-layer Plastic Film	2.0%	1.4%	106	Mattresses	-	-	-
Multi-layer Plastic Film	0.1%	0.1%	5	Broken Metal Furniture	-	-	-
Durable Film Plastic Items	-	-	-	Household Hazardous Waste	0.0%	0.0%	0
Remainder/Composite Plastic	0.1%	0.1%	5	Reusable Inert Construction Debris	-	-	-
Metal	**1.9%**	**0.9%**	**101**	Reusable Wood Furniture	1.1%	1.4%	59
Tin/Steel Cans	0.4%	0.5%	19	Reusable Metal Furniture	-	-	-
Aluminum Cans	0.1%	0.1%	8	Special Waste	0.0%	0.0%	0
Other Ferrous	1.1%	1.2%	60	Broken Wood Furniture	0.4%	0.5%	21
Other Non-ferrous	0.1%	0.1%	3	**Textiles**	**14.1%**	**16.5%**	**754**
Remainder/Composite Metal	0.2%	0.2%	10	Textiles - Organic	0.0%	0.0%	0
Glass	**0.8%**	**0.8%**	**44**	Textiles - Synthetic, Mixed, & Unknown	14.1%	16.5%	754
Glass Bottles & Containers	0.8%	0.6%	41	**Other Materials**	**0.7%**	**0.5%**	**38**
Remainder/Composite Glass	0.1%	0.1%	4	Fines	0.4%	0.4%	23
				Mixed Residue	0.3%	0.2%	15
Sample Count	*11*			**Total**	**100%**		**5,360**

Residential Disposed Waste

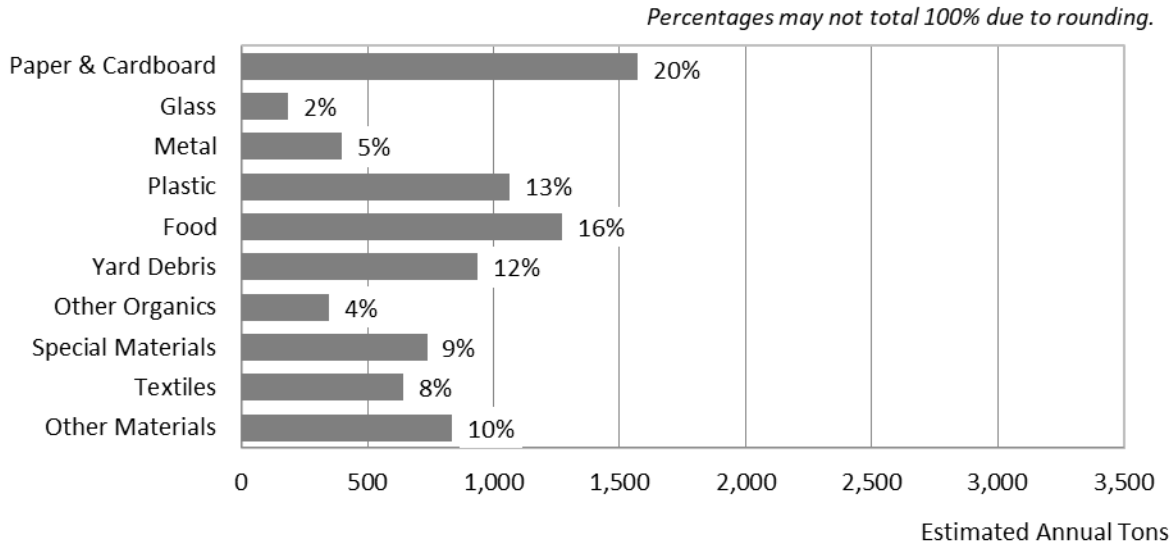
In 2023, Alaska Waste collected 7,985 tons of material in the residential disposed waste stream. Of that material, 74% (5,940 tons) was recoverable: 17% (1,361 tons) was recyclable, 37% (2,942 tons) was compostable, 18% (1,469 tons) was potentially recoverable through specialty diversion programs, and 2% (169 tons) was reusable (Figure 10). The remaining 26% (2,045 tons) was non-recoverable.

Figure 10. Tons by Recoverability: Residential Disposed Waste



Paper and cardboard was the most prevalent material class in the residential disposed waste stream, accounting for 20% (1,574 tons) of material (Figure 11). Food was the second-most prevalent material class (16% or 1,269 tons). Glass materials accounted for the smallest proportion of the stream (2% or 185 tons).

Figure 11. Tons by Material Class: Residential Disposed Waste



Leaves and grass was the most prevalent recoverable material type in the residential disposed waste stream, accounting for 8.6% (688 tons) of material (Table 18). *Textiles - synthetic, mixed, and unknown* was the most prevalent potentially recoverable material type, accounting for 7.8% (625 tons) of the stream. *Typically recyclable paper* was the most prevalent recyclable material, accounting for 5.7% (454 tons) of the stream.

Table 18. Five Most Prevalent Recoverable Materials: Residential Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons
Leaves & Grass	8.6%	2.9%	688
Food - Packaged Edible	8.1%	1.2%	649
Food Soiled/Compostable Paper	8.1%	1.6%	643
Textiles - Synthetic, Mixed, & Unknown	7.8%	1.8%	625
Typically Recyclable Paper	5.7%	1.4%	454
Total for Five Most Prevalent Materials	**38.3%**		**3,059**
All Other Materials	**61.7%**		**4,926**
Total Annual Tons	**100.0%**		**7,985**

After *typically recyclable paper*, *recyclable plastic packaging* was the most prevalent recyclable material in the residential disposed waste stream (3.3% or 263 tons; Table 19). This category includes *#1 PET*, *#2 HDPE*, *#4 LDPE*, and *#5 PP rigid plastic packaging*.

Table 19. Recyclable Material Composition Table: Residential Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	Est. Tons
Typically Recyclable Paper	5.7%	454
Recyclable Plastic Packaging	3.3%	263
Uncoated Corrugated Cardboard	2.3%	187
Glass Bottles & Containers	2.2%	173
Other Recyclable Metal	1.7%	139
Aluminum Cans	1.1%	85
Tin/Steel Cans	0.7%	60
Total	**17.0%**	**1,361**

Leaves and grass was also the most prevalent material type overall in the residential disposed waste stream (Table 20). *Single-layer plastic film* was the most prevalent non-recoverable material (3.6% or 290 tons).

Table 20. Detailed Composition Table: Residential Disposed Waste

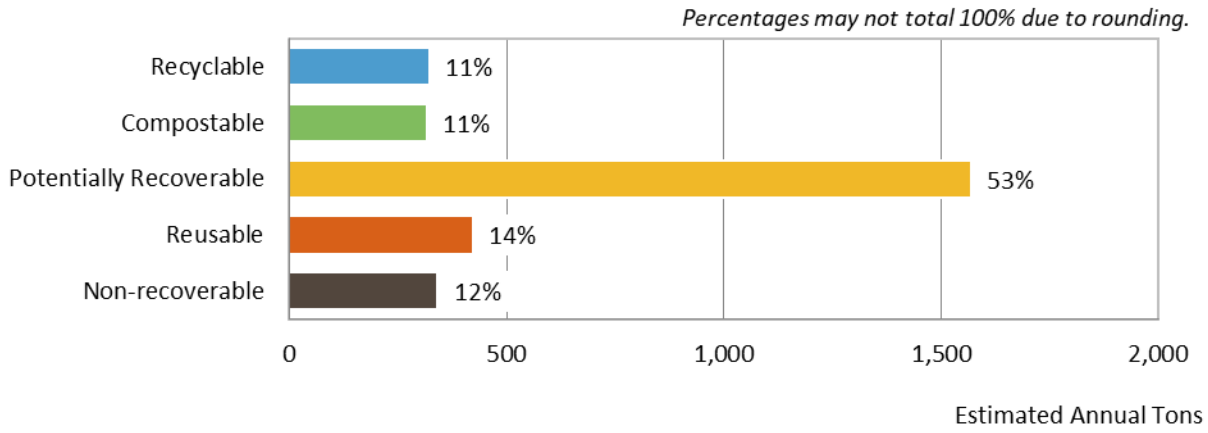
Confidence intervals calculated at the 90% confidence level. Percentages and tons for subtotals are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	**17.0%**	**2.4%**	**1,361**	**Food**	**15.9%**	**2.2%**	**1,269**
Compostable	**36.8%**	**4.2%**	**2,942**	Food - Packaged Edible	8.1%	1.2%	649
Potentially Recoverable	**18.4%**	**5.0%**	**1,469**	Food - Packaged Inedible	0.4%	0.1%	30
Reusable	**2.1%**	**1.4%**	**169**	Food - Unpackaged Edible	2.7%	1.4%	215
Non-recoverable	**25.6%**	**3.6%**	**2,045**	Food - Unpackaged Inedible	3.9%	1.3%	315
Paper & Cardboard	**19.7%**	**2.8%**	**1,574**	Beverages	0.8%	0.3%	61
Uncoated Corrugated Cardboard	2.3%	0.8%	187	**Yard Debris**	**11.7%**	**3.1%**	**936**
Typically Recyclable Paper	5.7%	1.4%	454	Leaves & Grass	8.6%	2.9%	688
Food Soiled/Compostable Paper	8.1%	1.6%	643	Woody Yard Debris	3.1%	2.8%	249
Non-recyclable or Non-compostable Paper	3.6%	1.0%	290	**Other Organics**	**4.3%**	**1.5%**	**347**
Plastic	**13.3%**	**1.9%**	**1,063**	Manures	-	-	-
#1 PET Rigid Plastic Packaging	1.7%	0.2%	133	Remainder/Composite Organic - Compostable	1.1%	0.7%	88
#2 HDPE Rigid Plastic Packaging	0.8%	0.3%	68	Other Clean Wood	0.4%	0.2%	31
#4 LDPE Rigid Plastic Packaging	0.1%	0.1%	4	Reusable Clean Wood	0.2%	0.3%	15
#5 PP Rigid Plastic Packaging	0.7%	0.1%	58	Remainder/Composite Organic - Non-compostable	2.7%	1.4%	213
Compostable Rigid Plastic Packaging	0.1%	0.1%	4	**Special Materials**	**9.2%**	**4.7%**	**736**
Compostable Plastic Single Use Food Service Ware	0.0%	0.0%	1	Other Inert Construction Debris	1.4%	1.2%	114
Other Rigid Plastic Packaging	0.7%	0.2%	58	Carpet	3.8%	4.4%	303
Other Durable Rigid Plastic Items	0.5%	0.2%	39	E-waste	1.2%	0.9%	95
Reusable Durable Rigid Plastic Items	1.9%	1.4%	154	Tires	-	-	-
Non-compostable Plastic Single Use Food Service War	0.1%	0.0%	6	Refrigerant-containing Items	-	-	-
Single-layer Plastic Film	5.6%	0.8%	447	Mattresses	-	-	-
Multi-layer Plastic Film	0.5%	0.1%	38	Broken Metal Furniture	1.9%	1.5%	149
Durable Film Plastic Items	-	-	-	Household Hazardous Waste	0.5%	0.6%	36
Remainder/Composite Plastic	0.7%	0.4%	52	Reusable Inert Construction Debris	-	-	-
Metal	**5.0%**	**1.6%**	**397**	Reusable Wood Furniture	-	-	-
Tin/Steel Cans	0.7%	0.2%	60	Reusable Metal Furniture	-	-	-
Aluminum Cans	1.1%	0.2%	85	Special Waste	0.1%	0.2%	12
Other Ferrous	1.2%	1.0%	95	Broken Wood Furniture	0.3%	0.5%	26
Other Non-ferrous	0.6%	0.3%	44	**Textiles**	**8.1%**	**1.8%**	**643**
Remainder/Composite Metal	1.4%	1.2%	113	Textiles - Organic	0.2%	0.2%	18
Glass	**2.3%**	**0.5%**	**185**	Textiles - Synthetic, Mixed, & Unknown	7.8%	1.8%	625
Glass Bottles & Containers	2.2%	0.5%	173	**Other Materials**	**10.5%**	**2.1%**	**835**
Remainder/Composite Glass	0.2%	0.1%	12	Fines	4.9%	1.1%	392
				Mixed Residue	5.5%	1.6%	443
Sample Count	*20*			**Total**	**100%**		**7,985**

Self-haul Disposed Waste

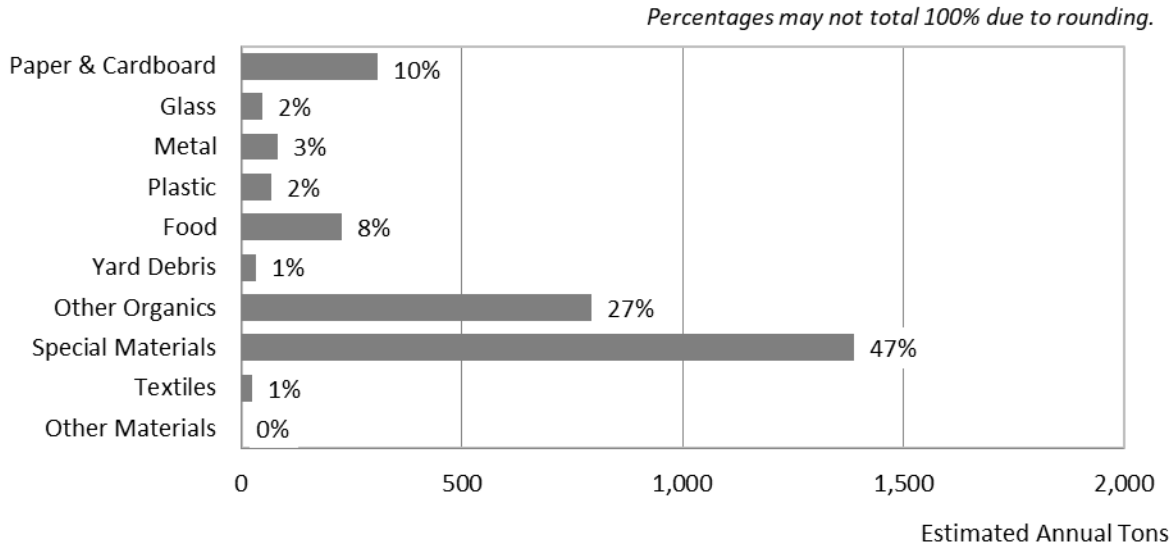
In 2023, Juneau residents and businesses hauled 2,973 tons of material in the self-haul disposed waste stream. Of that material, 88% (2,631 tons) was recoverable: 11% (322 tons) was recyclable, 11% (317 tons) was compostable, 53% (1,570 tons) was potentially recoverable through specialty diversion programs, and 14% (422 tons) was reusable (Figure 12). The remaining 12% (342 tons) was non-recoverable.

Figure 12. Tons by Recoverability: Self-haul Disposed Waste



Special materials was the most prevalent material class in the self-haul disposed waste stream, accounting for 47% (1,389 tons) of material (Figure 13). This class includes construction materials and bulky items like furniture. Other organics was the second-most prevalent material class (27% or 792 tons).

Figure 13. Tons by Material Class: Self-haul Disposed Waste



Other inert construction debris was the most prevalent recoverable material type in the self-haul disposed waste stream, accounting for 38.0% (1,131 tons) of material (Table 21). *Reusable clean wood* was the most prevalent reusable material type, accounting for 11.1% (330 tons) of the stream. *Food - unpackaged inedible* was the most prevalent compostable material, accounting for 7.6% (225 tons) of the stream. *Uncoated corrugated cardboard* was the most prevalent recyclable material, accounting for 4.8% (143 tons) of the stream.

Table 21. Five Most Prevalent Recoverable Materials: Self-haul Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons
Other Inert Construction Debris	38.0%	18.9%	1,131
Reusable Clean Wood	11.1%	7.7%	330
Other Clean Wood	7.7%	6.9%	228
Food - Unpackaged Inedible	7.6%	11.0%	225
Uncoated Corrugated Cardboard	4.8%	4.5%	143
Total for Five Most Prevalent Materials	**69.2%**		**2,057**
All Other Materials	**30.8%**		**916**
Total Annual Tons	**100.0%**		**2,973**

After *uncoated corrugated cardboard*, *typically recyclable paper* was the most prevalent recyclable material in the self-haul disposed waste stream (3.2% or 96 tons; Table 22). No *glass bottles and containers* were found in the stream.

Table 22. Recyclable Material Composition Table: Self-haul Disposed Waste

Percentages and tons for material types are rounded and may not sum to the totals shown.

Material	Est. %	Est. Tons
Uncoated Corrugated Cardboard	4.8%	143
Typically Recyclable Paper	3.2%	96
Other Recyclable Metal	2.0%	60
Tin/Steel Cans	0.7%	20
Recyclable Plastic Packaging	0.1%	2
Aluminum Cans	0.0%	1
Glass Bottles & Containers	0.0%	-
Total	**10.8%**	**322**

Other inert construction debris was also the most prevalent material type overall in the self-haul disposed waste stream (Table 23). *Remainder/composite organic - non-compostable* was the most prevalent non-recoverable material (6.3% or 188 tons).

Table 23. Detailed Composition Table: Self-haul Disposed Waste

Confidence intervals calculated at the 90% confidence level. Percentages and tons for subtotals are rounded and may not sum to the totals shown.

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	**10.8%**	**8.1%**	**322**	**Food**	**7.7%**	**11.0%**	**229**
Compostable	**10.7%**	**10.8%**	**317**	Food - Packaged Edible	-	-	-
Potentially Recoverable	**52.8%**	**20.3%**	**1,570**	Food - Packaged Inedible	-	-	-
Reusable	**14.2%**	**9.1%**	**422**	Food - Unpackaged Edible	0.1%	0.2%	4
Non-recoverable	**11.5%**	**5.5%**	**342**	Food - Unpackaged Inedible	7.6%	11.0%	225
Paper & Cardboard	**10.3%**	**9.2%**	**307**	Beverages	-	-	-
Uncoated Corrugated Cardboard	4.8%	4.5%	143	**Yard Debris**	**1.1%**	**0.8%**	**32**
Typically Recyclable Paper	3.2%	4.5%	96	Leaves & Grass	0.8%	0.6%	25
Food Soiled/Compostable Paper	0.4%	0.6%	11	Woody Yard Debris	0.3%	0.4%	7
Non-recyclable or Non-compostable Paper	2.0%	2.8%	58	**Other Organics**	**26.6%**	**11.2%**	**792**
Plastic	**2.3%**	**2.0%**	**68**	Manures	-	-	-
#1 PET Rigid Plastic Packaging	0.0%	0.0%	1	Remainder/Composite Organic - Compostable	1.5%	1.8%	45
#2 HDPE Rigid Plastic Packaging	0.0%	0.0%	1	Other Clean Wood	7.7%	6.9%	228
#4 LDPE Rigid Plastic Packaging	-	-	-	Reusable Clean Wood	11.1%	7.7%	330
#5 PP Rigid Plastic Packaging	-	-	-	Remainder/Composite Organic - Non-compostable	6.3%	3.4%	188
Compostable Rigid Plastic Packaging	-	-	-	**Special Materials**	**46.7%**	**16.5%**	**1,389**
Compostable Plastic Single Use Food Service Ware	-	-	-	Other Inert Construction Debris	38.0%	18.9%	1,131
Other Rigid Plastic Packaging	0.0%	0.0%	0	Carpet	1.0%	1.6%	30
Other Durable Rigid Plastic Items	0.2%	0.1%	4	E-waste	0.0%	0.0%	1
Reusable Durable Rigid Plastic Items	0.6%	0.9%	19	Tires	4.5%	4.7%	133
Non-compostable Plastic Single Use Food Service War	-	-	-	Refrigerant-containing Items	0.6%	1.0%	19
Single-layer Plastic Film	0.3%	0.5%	10	Mattresses	0.0%	0.0%	0
Multi-layer Plastic Film	0.0%	0.1%	1	Broken Metal Furniture	0.0%	0.0%	0
Durable Film Plastic Items	0.0%	0.0%	0	Household Hazardous Waste	-	-	-
Remainder/Composite Plastic	1.0%	1.5%	31	Reusable Inert Construction Debris	2.1%	2.9%	61
Metal	**2.8%**	**2.1%**	**83**	Reusable Wood Furniture	0.4%	0.6%	11
Tin/Steel Cans	0.7%	0.9%	20	Reusable Metal Furniture	0.0%	0.0%	0
Aluminum Cans	0.0%	0.0%	1	Special Waste	0.0%	0.0%	1
Other Ferrous	1.7%	1.7%	51	Broken Wood Furniture	0.1%	0.1%	2
Other Non-ferrous	0.3%	0.3%	9	**Textiles**	**0.8%**	**0.6%**	**24**
Remainder/Composite Metal	0.1%	0.1%	2	Textiles - Organic	0.0%	0.0%	0
Glass	**1.6%**	**2.5%**	**48**	Textiles - Synthetic, Mixed, & Unknown	0.8%	0.6%	24
Glass Bottles & Containers	-	-	-	**Other Materials**	**-**	**-**	**-**
Remainder/Composite Glass	1.6%	2.5%	48	Fines	-	-	-
				Mixed Residue	-	-	-
Sample Count	*30*			**Total**	**100%**		**2,973**

Appendix A: Detailed Study Design

This appendix includes the study design as it was drafted prior to the start of field work. Field work did not deviate from the planned study design.

Study Overview

Sampling Universe

The first step in planning a waste characterization study is to identify and carefully define the sectors and streams that will be studied, or the "universe" of materials. In this study, the universe includes five distinct sectors. A "sector" is a unique portion of the total waste and is determined by its particular generation, collection, or composition characteristics.

This study will include the sectors listed below:

- **Commercial waste**: Materials collected by Alaska Waste (AW) in packer trucks that the driver identifies as containing waste primarily from sources other than single-family residences.
- **Single-family waste**: Materials collected by AW in packer trucks that the driver identifies as collected along a primarily single-family residential route. This stream may include minimal quantities of multifamily waste where multifamily properties have cart service.
- **Roll-off waste**: Materials collected by AW in open top or compacted roll-off containers.
- **Self-haul waste**: Material that is generated at residences, businesses, or institutions, and is hauled by the household or business that generated the waste or other non-franchised haulers (like a contractor, landscaper, or junk removal service).

All customers delivering municipal solid waste (MSW) or construction and demolition (C&D) debris to Capitol Landfill will be eligible for sampling. For the purposes of this study, C&D debris is defined as the materials typically used in the construction of a structure or civil project (roads and bridges) such as concrete, wood, and roofing. MSW is everything else the landfill accepts for disposal that is not C&D. Loads of yard debris, aggregates, and soil set aside for beneficial use and household hazardous waste (HHW) will not be sampled and are excluded from the study. Loads of disaster debris (storm deadfall and soil, for example) will not be sampled.

Sampling Calendar and Sample Allocation

Cascadia will conduct the characterization study over a single six-day week in May 2024. The field crew will collect and characterize 80 samples approximately evenly across each day of the week. Sampling will begin on Monday May 20 and complete on Saturday May 25. Table 24 summarizes the sample allocation.

Table 24. Planned Samples by Sector

	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Totals
Commercial	2	2	3	3	3	2	**15**
Single-family	4	4	4	4	4	0	**20**
Roll-off	3	3	3	3	3	0	**15**
Self-haul	3	3	3	3	3	15	**30**
Totals	**12**	**12**	**13**	**13**	**13**	**17**	**80**

Field Work Overview and Procedures

Key Field Work Roles

This document refers to several key staff roles. The role names are capitalized throughout the document. The responsibilities for each role include:

- **Facility Primary Contact (Site Contact):** Often the facilities or operations manager. Ensures that all staff at the facility are aware of the waste characterization study. Communicates to key facility staff the schedule of field work and their role(s) in the study. Ensures that the Cascadia field crew receives a facility specific safety briefing. See the Facilities Roles and Equipment section for more details. Capitol Landfill has identified Andy Tapia as the Facility Primary Contact.
- **Facility Loader Operator:** Works closely with the Sort Crew Lead and Vehicle Surveyor to collect waste samples, place the samples near the Cascadia field crew, and remove samples after sorting. See the Facilities Roles and Equipment section for more details.
- **Scalehouse Staff:** Works closely with the Vehicle Surveyor to identify incoming loads and provide vehicle net weights for surveyed vehicles.
- **Primary Hauler Contact:** Often a route manager. Ensures that all collections drivers are aware of the waste characterization study. Communicates with the field crew about the ETA for expected vehicles each day and the number of roll-off loads expected. Alaska Waste has identified Joe Shinn and Primary Hauler Contact.
- **Sort Crew Lead:** Is the onsite field crew contact for the facility staff. Ensures the safety of the field crew. Ensures the field crew checks into and out of the facility each day. Communicates with the Facility Loader Operator and Vehicle Surveyor to ensure all needed samples are collected and brought to the sorting area. Assists with the sorting. Ensures the quality of the Sorters' work and manages the sample weight data entry. Khori Bjork will be the Sort Crew Lead.

- **Sorters:** Assist with all field work aspects of the study. The Sorters are primarily responsible for sorting waste samples.
- **Vehicle Surveyor**: Interviews drivers arriving at the facility to select loads for sampling. Collects net weights for selected vehicles. Communicates with facility scale house staff when on-site.

The Cascadia staff (Sort Crew Lead, Sorters, and Vehicle Surveyor) will be collectively referred to as the field crew. The Sort Crew Lead and Sorters will be collectively referred to as the sort crew. The field crew typically consists of one Vehicle Surveyor, one Sort Crew Lead, and three Sorters.

Equipment

The Cascadia team travels with nearly all of the equipment needed for the field work. A typical list of equipment includes:

- Hard hats
- Hard toed boots
- High visibility vests
- Safety glasses
- Puncture resistant gloves
- Nitrile Gloves
- Coveralls
- Ear plugs
- Face masks
- 1 300 lb. capacity battery operated scale
- 1 small capacity scale
- 1 hardened laptop
- 2-3 Magnets
- Dry erase board with markers
- 2 sorting tables
- 70 Baskets
- 10 Barrels
- Folding table for data entry
- 16 tarps (at least 8’x12’)
- Clipboard
- Snow shovel
- Push broom and hand broom
- Hand rakes and trowels
- Box cutters
- Pens/pencils/markers
- Tissues
- Hand sanitizer
- Disinfectant wipes
- Disinfectant spray
- Paper towels
- Plastic trash bags

Field Work Training

Cascadia’s field crew is composed entirely of professional, full-time staff with extensive field work experience. They are well versed in standard field work operations and safety protocols. Each study and facility is unique and requires these additional training steps:

- Prior to beginning field work, the members of the sort crew will be trained in the implementation of this project’s specific sorting protocols and material type definitions.
- The first day of field work will have a reduced focus on meeting productivity goals and an increased focus on hands-on implementation of this project’s specific sorting protocols and material type definitions.
- The first day at the facility will include a site walkthrough, site specific safety briefing, an introduction to key site staff, and a review of key site staff roles.

Procedures

SURVEYING

A vehicle surveyor will be the designated "gatekeeper" responsible for surveying, counting, and selecting vehicles for the study. During each field day, the Vehicle Surveyor will use the Cascadia-developed *Vehicle Survey Sheet* and *Vehicle Selection Sheet* to track incoming eligible vehicles and flag the vehicles for sampling. To track and flag vehicles for sampling, the Vehicle Surveyor will survey the driver of every vehicle with eligible inbound loads to obtain and record key data on the sector of the waste. For a vehicle to be eligible the load must meet the definitions for the study (described in the Sampling Universe section).

SELECTING VEHICLES

Cascadia will use a random, systematic process to select vehicles as they arrive at the facility for sampling. For each sector included in the study, Cascadia will set a sampling frequency for vehicles as they arrive using the procedures below.

1. For each sampling day and each sector, the expected number, *L*, of arriving loads will be estimated using information provided by AW. The number *L* is then reduced by one-fifth (producing 0.8 * *L*). This will be done to ensure that the targeted number of loads for each sector will be selected on each sampling day, even if traffic is lighter than expected.
2. Next, the interval *n* will be determined to insure systematic sampling of vehicles. If *r* represents the number of samples needed for a sector, and 0.8 * *L* represents the number of expected loads from the sector, then *n* is calculated by dividing 0.8 *x *L* by *r*. To help facilitate this process, a *Vehicle Selection Sheet* will be constructed for each day.

If the vehicle is eligible, and is the correct n^{th} vehicle, the Vehicle Surveyor will place a *Sample Placard* printed with a unique sample ID on the vehicle's windshield or dashboard to identify it as a vehicle intended for sampling. Once a vehicle has been selected for sampling, the Vehicle Surveyor will record the unique sample ID assigned to the load on the *Vehicle Survey Sheet*. After the Vehicle Surveyor has collected the pertinent information from the driver, they will direct the vehicle to the sampling area at the facility's tip area.

In addition to selecting vehicles to sample, the Vehicle Surveyor will collect the net weight from each surveyed vehicle. For vehicles with a tare weight in the system the net weight can be collected at the time of the survey. Vehicles with a stored tare weight will be issued a numbered tag on entry. The scale staff will collect the tag when the vehicle exits and note the net weight on the tag. The Vehicle Surveyor will collect the numbered tags at the end of each day.

COLLECTING SAMPLES

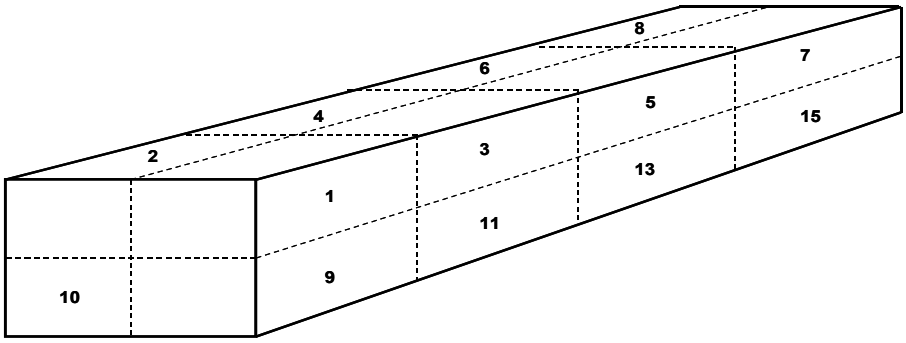
Single-family, Commercial, and Compacted Roll-off Loads

When a selected vehicle arrives at the sampling area the Sort Crew Lead will direct the driver to the designated tip area at the facility, collect the *Sample Placard* from the vehicle, and log the sample ID, truck number and unusual circumstances associated with the load or the sample on the *Sample Tracking Form*.

After the selected vehicle tips its load, the sort crew will obtain a 200-pound sample of waste to hand-sort. The team will work with the Facility Loader Operator to secure a sample by extracting a randomly selected portion from the tipped load using the following procedure:

- The vehicle driver will dump the selected load in an elongated pile.
- The Sort Crew Lead will select a sample from this pile using an imaginary 16-cell grid (shown in Figure 14) superimposed over the dumped material. The Sort Crew Lead will use a randomly generated number (1-16) that is pre-printed on the *Sample Placard* to determine from which cell to extract a sample.
- The Facility Loader Operator will extract a sample from the selected cell under direction from the Sort Crew Lead and deposit the sample on a clean tarp for sorting.

Figure 14. 16-cell Grid for Sample Collection



Open Roll-off and Self-haul Loads

For open roll-off and self-haul loads, the Sort Crew Lead will direct the driver to tip the entire load at the designated sampling area. The entire load will represent one sample and will be visually characterized. The load will remain in a distinct pile in the designated tip area until the sort crew informs facility staff that they are done visually characterizing the load. The visual characterization method is described in the Sorting Procedures section.

Figure 15. Tarped Sample with Sample Placard

SORTING PROCEDURES

Hand-sort Procedure

Single-family, commercial, and compacted roll-off samples will be hand sorted. Cascadia's process for hand-sorting waste includes the following steps:

1. A member of the sort crew will take photographs of the sample using a digital camera. The *Sample Placard* identifying the sample will be positioned to be visible in each photo. Figure 15 shows a sample ready to be sorted on a tarp with a placard.

2. The sort crew will sort the sample into the material types and store separated materials in plastic laundry baskets. Individual members of the sort crew typically specialize in groups of materials, such as papers or plastics. The Sort Crew Lead will monitor the homogeneity of material in the baskets as they accumulate, rejecting any materials that are improperly classified. For material that is difficult to sort due to adhesion, wetness, or partial decomposition, the Sorters will use their best judgement to categorize the material. If it is practical to separate joined materials (such as a zip lock bag with metal screws in it), the Sorters will do so. The material list and definitions that will be used for the reporting are shown in Appendix B: Material List.
3. Materials that pass through the two inch screen are recorded as *fines*.
4. Measure the volume of each material type.
5. Weigh each material type.

The sort crew works as a bucket brigade and weighs each material type from each sample using a call and response approach. The sample weigh out process is detailed below:

- A Sorter places a basket of material on the scale and calls out the material type.
- The Sort Crew Lead repeats the material type, visually inspects the purity of the material in the basket and records the weight in OSCAR, Cascadia's field data entry platform. After the weight is entered the Sort Crew Lead notes that the scale can be cleared.
- A Sorter removes the basket of material from the scale dumps it into the discard pile. The process restarts at the first step with a new basket of material.
- While the weigh out process is occurring, one Sorter is surveying the sort area to ensure all baskets with material are at the scale and the area is clean and clear, ready for the next sample.

The sort crew will have paper Material Tally Sheets as backup in case the data entry platform is unavailable. See Appendix D: Field Form for example field forms.

Visual Sampling Procedure

Open roll-off and self-haul loads will be visually characterized. Cascadia's process for visually characterizing waste includes the following steps:

1. A member of the sort crew will take photographs of the sample using a digital camera. The *Sample Placard* identifying the sample will be positioned to be visible in each photo.
2. A member of the sort crew will use a tape measure to obtain the length, width, and height of the sample and record the total volume in the data management tool.
3. The sort crew member will walk around the entire load and note the major material classes that are present in the load.
4. Beginning with the largest major material class present by volume, the crew member will estimate the volume percentage of each material class (e.g., glass or plastic) and record it. This process is repeated for the next most common material class, and so forth, until the volume percentage of every material class has been estimated. The crew member will then calculate the sum for this step, ensuring that it totals 100%.
5. Next, the crew member will consider each material class separately and estimate the percentage of each material class that is made up of each material type. For example, *aluminum cans* is a material type within the material class of metal. While considering only the metal material class, the crew member will estimate the volume percentage of metal materials that is composed of *aluminum*

cans. The crew member will then do the same for every other material type within the metal material class (such as *tin/steel cans*). The total of percentages for all of the material types must equal 100%.

6. The crew member will ensure that the percentage estimates for the major material classes add up to 100%. The percentage estimates for the specific material types within each major class must also total 100%.

END OF DAY PROCEDURES

At the end of each day the Sort Crew Lead will:

- Ensure that the work area is cleared of hazards.
- Ensure that any equipment or samples remaining on site are stored according to the instructions of the Facility Primary Contact.
- Communicate to the Facility Loader Operator that the sorted material can be removed from the sort area.
- Complete quality control checks on the field data.
- Check out with the Facility Primary Contact.

Facilities Roles and Equipment

Roles and Responsibilities

FACILITY PRIMARY CONTACT

Time requirement: Approximately 30 minutes on the first day and 15 minutes on subsequent days.

- This person will meet the field crew when they arrive and be the onsite contact for facility related questions throughout the day.
- They will designate a person to provide a safety briefing and give a tour of relevant parts of the facility, including the sorting area, bathrooms, and break room.
- In preparation for the audit, they will designate the work area and have it cleared of material and equipment before the sort crew arrives. This area should also allow for overnight storage of non-valuable equipment such as the sorting table and waste sorting baskets.
- They will also notify key staff of the schedule and overview of the audit.

LOADER OPERATOR

Time requirement: Approximately five minutes per sample. This commitment is typically spread throughout the first six hours each the field crew is on site each day. Another 10 minutes at the end of each day to back drag or otherwise handle the sorted material.

- This person will work directly with the Sort Crew Lead to bring the samples to the sorting area and remove sorted material from the sorting area.

- They will need to operate a loader capable of scooping and transporting a sample of waste from the tipping area to the sorting area.
- They will need to be responsive to communications from the Sort Crew Lead throughout the day, providing samples and removing sorted material at a pace consistent to the rate of sorting.

Scalehouse Staff

Time requirement: The time commitment from the Scalehouse Staff is variable depending on the layout of the facility and the process for collecting net weights. Cascadia's experienced crew will work to minimize the burden on Scalehouse Staff.

- This person will work directly with the Vehicle Surveyor to support the surveys.
- They will facilitate the collection of net weights from surveyed vehicles.
- They will facilitate notifying staff at the tipping face when a vehicle selected for sampling is identified.

Equipment

- Radio for Sort Crew Lead.
- Loader for assistance with the sampling.
- Minimum 20'x20' level space to queue and sort samples. Preferably a 40' x 20' space. A hard surface is preferable in inclement weather.
- Access to a restroom and breakroom.

Example Daily Schedule

A typical day of field work at the Capitol landfill may proceed according to the following schedule:

- 7:00am (8:00am on Saturday) Field crew arrives and checks in with Facility Primary Contact.
- Field crew will access the facility using the same procedure as Capitol landfill employees.
- 7:15am (8:15am on Saturday) Vehicle Surveyor begins surveying.
- 7:30am (8:30am on Saturday) Vehicle Surveyor selects first load for sampling and continues selecting loads throughout the day.
- 7:30am (8:30am on Saturday) Sort crew begins sorting the first selected load.
- 3:00pm (11:30am on Saturday) Vehicle Surveyor selects the final load for sampling.
- 3:00pm (11:30am on Saturday) Sort crew begins sorting the final load for sampling.
- 4:00 pm (12:00pm on Saturday) Vehicle Surveyor finishing surveying and sort crew begins their work area clean up.
- 4:00 pm (12:00pm on Saturday) Facility Loader Operator removes any remaining sorted and unsorted material.
- 4:30pm (12:30pm on Saturday) Field crew leaves and checks out with Facility Primary Contact.

Field Data QA/QC Plan

Vehicle Survey QA/QC

- The Vehicle Surveyor will check the forms daily to ensure that all appropriate information has been gathered and correct any errors while the day's work is fresh in their mind.
- Following each day's field work, a member of the field crew will enter the vehicle survey data into an Excel workbook.
- After they are returned to the office a data manager will spot check the paper field forms against the electronic record to confirm that all the required data is properly entered. Survey entries with errors or that are incomplete will be excluded from any analysis. Prior waste studies have shown that 3-5% of survey records are incomplete.

Sample Data QA/QC

- The Sort Crew Lead will monitor the open sort bins as each sample is sorted, rejecting materials that are improperly classified. Open bins allow the Sort Crew Lead to see the material at all times. The Sort Crew Lead will also verify the purity of each component during the weigh-out.
- The sort crew handles material from one sample at a time to prevent cross contamination of samples and reduce the likelihood of data entry errors.
- The Sort Crew Lead is responsible for recording data to ensure that is done consistently from day to day.
- The call and response weigh out approach ensures that sample data is properly recorded and constantly reinforces what items are acceptable in each material type to the sort crew.
- OSCAR has built in error checking routines including a running tally of the sample weight to provide real time feedback on underweight samples and daily notifications to the data manager on how many samples have been recorded to ensure that sample targets are being met.
- OSCAR operates in an offline mode to ensure complete functionality in areas with intermittent or no cell service (common in landfills). Data is stored and backed up locally and then uploaded to a cloud server each day when the field crew returns to their lodgings. The data manager makes regular comparisons between the local backup and online data to ensure items have synced properly.
- The Sort Crew Lead will tally up the sample counts at the end of each field day to track the progress of sampling and compares this to the records in OSCAR.

Appendix B: Material List

Waste samples were sorted into 54 unique material types, which were grouped into one of 10 material classes (e.g., paper and cardboard, plastic, food, etc.) and one of five recoverability groups (e.g., recyclable, compostable, etc.). Recyclable materials were further grouped into seven recyclable material categories. Recoverability assignments are summarized in Table 25, recyclable material assignments are summarized in Table 26, and Material class assignments and material type definitions are listed in Table 27.

Table 25. Material Types by Recoverability Group

Recyclable	Compostable
Uncoated Corrugated Cardboard	Food Soiled/Compostable Paper
Typically Recyclable Paper	Compostable Rigid Plastic Packaging
Glass Bottles & Containers	Compostable Plastic Single Use Food Service Ware
Tin/Steel Cans	Food - Packaged Edible
Aluminum Cans	Food - Packaged Inedible
Other Ferrous	Food - Unpackaged Edible
Other Non-ferrous	Food - Unpackaged Inedible
#1 PET Rigid Plastic Packaging	Beverages
#2 HDPE Rigid Plastic Packaging	Leaves & Grass
#4 LDPE Rigid Plastic Packaging	Woody Yard Debris
#5 PP Rigid Plastic Packaging	Manures
	Remainder/Composite Organic - Compostable (incl. pet waste)
Potentially Recoverable	**Non-recoverable**
Other Rigid Plastic Packaging	Non-recyclable or Non-compostable Paper
Other Durable Rigid Plastic Items	Remainder/Composite Glass
Other Clean Wood	Remainder/Composite Metal
Other Inert Construction Debris	Non-compostable Plastic Single Use Food Service Ware
Carpet	Single-layer Plastic Film
E-waste	Multi-layer Plastic Film
Tires	Durable Film Plastic Items
Refrigerant-containing Items	Remainder/Composite Plastic
Mattresses	Remainder/Composite Organic - Non-compostable
Broken Metal Furniture	Special Waste
Household Hazardous Waste	Broken Wood Furniture
Textiles - Organic	Fines
Textiles - Synthetic, Mixed, & Unknown	Mixed Residue
Reusable	
Reusable Durable Rigid Plastic Items	Reusable Wood Furniture
Reusable Clean Wood	Reusable Metal Furniture
Reusable Inert Construction Debris	

Table 26. Material Types in Recyclable Material Categories

Recyclable Material Category	Material Type
Uncoated Corrugated Cardboard	Uncoated Corrugated Cardboard
Typically Recyclable Paper	Typically Recyclable Paper
Glass Bottles & Containers	Glass Bottles & Containers
Tin/Steel Cans	Tin/Steel Cans
Aluminum Cans	Aluminum Cans
Recyclable Plastic Packaging	#1 PET Rigid Plastic Packaging
Recyclable Plastic Packaging	#2 HDPE Rigid Plastic Packaging
Recyclable Plastic Packaging	#4 LDPE Rigid Plastic Packaging
Recyclable Plastic Packaging	#5 PP Rigid Plastic Packaging
Other Recyclable Metal	Other Ferrous
Other Recyclable Metal	Other Non-ferrous

Table 27. Material List and Definitions

Material Class	Material ID	Material Name	Definition
Paper & Cardboard	1	Uncoated Corrugated Cardboard	Paper laminate usually composed of three layers. The center wavy layer is sandwiched between the two outer layers. It does not have any coating on the inside or outside. Examples include cardboard packaging and containers, such as shipping and moving boxes, computer packaging cartons, and sheets and pieces used as dividers in boxes. This type is commonly referred to as OCC. This type does not include chipboard boxes such as cereal and tissue boxes. This type does include very clean (no food residue and only lightly stained) pizza boxes.
Paper & Cardboard	2	Typically Recyclable Paper	Items made of paper generally recyclable or not generally composted. Paper may be combined with minor amounts of other materials such as wax or glues. Examples include newspapers and glossy inserts found in newspapers, election guides, plain news packing paper, stapled college class schedules, tax instruction booklets, folding cartons and paperboard boxes such as breakfast cereals, frozen foods, or paper-based tubes, kraft paper such as paper grocery bags and clean multiwall bags for flour, general office-type papers such as copy paper, computer printer paper, letter paper and business forms colored ledger, manila folders, manila envelopes, index cards, lined or colored notebook paper, and carbonless forms, and items made of chipboard, ground wood paper, school construction

Material Class	Material ID	Material Name	Definition
			paper, self-adhesive notes, phone books and directories, greeting cards, envelopes with or without clear windows, glossy magazines, catalogs, hardcover books with the cover removed, paperback books, brochures, and pamphlets. Does not include envelopes lined with plastic or bubble wrap.
Paper & Cardboard	3	Food Soiled/ Compostable Paper	Items that are made mostly of paper, that are combined with other materials, or are contaminated with large amounts of wax, food, and/or moisture, and which are compostable. Examples include waxed corrugated cardboard, single use food service items labeled compostable such as paper bowls, straws, non-coated paper cups and clamshells, often with a brown stripe and/or a rough texture, food-soiled and moisture-soiled paper. Also includes pulp paper egg cartons, unused pulp plant pots, molded paper packing materials, some berry trays, waxed paper, napkins, tissue, paper towels, bagged or loose shredded paper.
Paper & Cardboard	4	Non-recyclable or Non-compostable Paper	Paper that has potential to be recycled but is less commonly accepted in a curbside program or items made mostly of paper but combined with large amounts of other materials. These are items that do not fit into any other categories. Examples include clean or food soiled single use food service items not labeled compostable or have a coating such as paper bowls or straws, spiral bound paper, blueprints, sepia, onion skin, carbon paper, photographs, sheets of paper stick-on labels, butcher paper, paper cigarette packs, paper frozen juice cans with metals ends, hardcover books with the cover attached, and envelopes lined with plastic or bubble wrap, clean shiny paper cups, aseptic containers (bleached polycoated paperboard containers or paper containers with a foil liner such as apple juice or vegetable broth), gable-top cartons (milk cartons), non-compostable coffee cups, deep-toned or fluorescent dyed paper, and packaging/packaging-related items that can't be placed in other categories, that are usually combined with non-paper materials

Material Class	Material ID	Material Name	Definition
			(paper bags and boxes with a plastic, wax, or foil component (lining, window, coating, etc.).
Glass	5	Glass Bottles & Containers	Glass containers. Examples include whole or broken soda bottles and fruit juice bottles, whole or broken wine cooler bottles, mayonnaise jars, and jam jars.
Glass	6	Remainder/ Composite Glass	Glass that cannot be put in any other type. It includes flat glass and items made mostly of glass but combined with other materials. Examples include glass window panes, doors and table tops, flat automotive window glass (side windows), safety glass, and architectural glass, Pyrex, Corning ware, crystal and other glass tableware, drinking glasses, mirrors, non-fluorescent light bulbs, auto windshields, laminated glass, or any curved glass.
Metal	7	Tin/Steel Cans	Rigid containers made mainly of steel. These items will stick to a magnet and may be tin-coated. This subtype is used to store food, beverages, paint, and a variety of other household and consumer products. Examples include canned food and beverage containers, empty metal paint cans, empty spray paint and other aerosol containers, and bimetal containers with steel sides and aluminum ends.
Metal	8	Aluminum Cans	Any food or beverage container that is made mainly of aluminum. Examples include most aluminum soda or beer cans, some pet food and meat cans. This subtype does not include bimetal containers with steel sides and aluminum ends.
Metal	9	Other Ferrous	Any iron or steel that is magnetic or any stainless steel item. This type does not include tin/steel cans. Examples include structural steel beams, metal clothes hangers, metal pipes, stainless steel cookware, security bars, and scrap ferrous items.
Metal	10	Other Non-ferrous	Any metal item, other than aluminum cans, that is not stainless steel and that is not magnetic. These items may be made of aluminum, copper, brass, bronze, lead,

Material Class	Material ID	Material Name	Definition
			zinc, or other metals. Examples include aluminum window frames, aluminum siding, copper wire, shell casings, brass pipe, and aluminum foil.
Metal	11	Remainder/ Composite Metal	Metal that cannot be put in any other type. This type includes items made mostly of metal but combined with other materials and items made of both ferrous metal and non-ferrous metal combined. Examples include small simple appliances (typically with only a single mode on/off switch) such as a simple toaster; major appliances including washing machines, clothes dryers, hot water heaters, stoves, and refrigerators; used oil filters, motors, insulated wire, and finished products that contain a mixture of metals, or metals and other materials, whose weight is derived significantly from the metal portion of its construction.
Plastic	12	#1 PET Rigid Plastic Packaging	Bottles, jars, containers, tubs, lids, and packaging thermoforms that are marked with PET (1). Packaging may have originally contained beverages, food, household products, or consumer products (e.g., toys or electronics). Single use food service items are in a separate material type.
Plastic	13	#2 HDPE Rigid Plastic Packaging	Bottles, jars, containers, tubs, lids, and packaging thermoforms that are marked with HDPE (2). Packaging may have originally contained beverages, food, household products, or consumer products (e.g., toys or electronics). Single use food service items are in a separate material type.
Plastic	14	#4 LDPE Rigid Plastic Packaging	Bottles, jars, containers, tubs, lids, and packaging thermoforms that are marked with LDPE (4). Packaging may have originally contained beverages, food, household products, or consumer products (e.g., toys or electronics). Single use food service items are in a separate material type.
Plastic	15	#5 PP Rigid Plastic Packaging	Bottles, jars, containers, tubs, lids, and packaging thermoforms that are marked with PP (5). Packaging may have originally contained beverages, food, household products, or consumer products (e.g., toys or electronics).

Material Class	Material ID	Material Name	Definition
Plastic	16	Compostable Rigid Plastic Packaging	Bottles, jars, containers, tubs, lids, and packaging thermoforms that are labeled compostable or labeled with PLA in the chasing arrows recycling symbol. Packaging may have originally contained beverages, food, household products, or consumer products (e.g., toys or electronics). Examples often include a brown stripe.
Plastic	17	Other Rigid Plastic Packaging	Bottles, jars, containers, tubs, lids, and packaging thermoforms that are made of types of plastic other than PET (1), HDPE (2), LDPE (4) or PP (5). Items may be made of vinyl, PVC, PS (polystyrene), or other plastic. They may bear the number 3, 6, or 7 in the triangular recycling symbol, or may bear no recycling symbol. Packaging may have originally contained beverages, food, household products, or consumer products (e.g., toys or electronics). Examples include hardware and fastener packaging, detergent and cleaning products bottles, squeezable bottles, frozen food containers, microwave food trays, PS packing peanuts, vitamin bottles, cookie trays found in cookie packages, small (less than 1 gallon) plant containers such as nursery pots and plant six-packs. Single use food service items are in a separate material type.
Plastic	18	Compostable Plastic Single Use Food Service Ware	Items made entirely of compostable plastics that are used to consume, contain, or transport prepared food items intended to be eaten with further preparation and in a single sitting. This includes plastic plates, bowls, cups (and lids), utensils, straws, stirrers, take-out containers (e.g., clamshells), and condiment cups.
Plastic	19	Non-compostable Plastic Single Use Food Service Ware	Items made partially or entirely of non-compostable plastics that are used to consume, contain, or transport prepared food items intended to be eaten without further preparation and in a single sitting. This includes plastic plates, bowls, cups (and lids), utensils, straws, stirrers, take-out containers (e.g., clamshells), and condiment cups. Includes single use food service items made from any plastic resin code.

Material Class	Material ID	Material Name	Definition
Plastic	20	Single-layer Plastic Film	Plastic film that has a single layer. A film is thin enough to be hand formed around a complex curve. Examples include other types of plastic bags (sandwich bags, zipper-recloseable bags, newspaper bags, produce bags, frozen vegetable bags, bread bags), trash bags, grocery/merchandise bags, agricultural film (films used in various farming and growing applications, such as silage greenhouse films, mulch films, and wrap for hay bales), plastic sheeting used as drop cloths, building wrap, shrink-wrap, mattress bags, furniture wrap, plastic strapping and string, film bubble wrap, and plastic food wrap.
Plastic	21	Multi-layer Plastic Film	Plastic film that has multi layers. A film is thin enough to be hand formed around a complex curve. Examples include mailing pouches, juice pouches, food wrappers such as candy-bar wrappers, potato chip bags, bank bags, X-ray film, metallized film (such as balloons), plastic coffee bags like Starbucks and Peet's, and other pouches.
Plastic	22	Reusable Durable Rigid Plastic Items	Plastic items other than containers or film plastic, that are made to last for more than one use **that appear to be unbroken or whole**. These items may bear the numbers 1 through 7 in the triangular recycling symbol. Examples include crates, buckets (including 5-gallon buckets), baskets, totes, large plastic garbage cans, large tubs, large storage tubs/bins (usually with lids), flexible (non-brittle) flower pots of 1 gallon size or larger, lawn furniture, large plastic toys, tool boxes, first aid boxes, and some sporting goods, CDs and their cases, plastic housewares such as durable (not single-use) dishes, cups, and cutlery. This type also includes building materials such as house siding, plastic lumber, window sashes and frames, housings for electronics such as computers, televisions and stereos, fan blades, and plastic pipes and fittings.
Plastic	23	Other Durable Rigid Plastic Items	Durable plastic items that are broken or not whole.

Material Class	Material ID	Material Name	Definition
Plastic	24	Durable Film Plastic Items	Film plastic items that are made to last for more than one use. Examples include tarps, shower curtains, and inflatable mattresses.
Plastic	25	Remainder/ Composite Plastic	Plastic that cannot be put in any other type. This type includes items made mostly of plastic but combined with other materials. Examples include auto parts made of plastic attached to metal, some kitchen ware, some toys, window blinds, insulating foam, handles and knobs, new Formica, new vinyl, or new linoleum, plastic rigid bubble/foil packaging (as for medications), and expanded polystyrene items not used for packaging, such as insulation boards. Note: does not include any plastic packaging - those items should go in other categories.
Food	26	Food - Packaged Edible	The portions of food typically consumed by humans if that food is in any sort of packaging.
Food	27	Food - Packaged Inedible	The portions of food not typically consumed by humans if that food is in any sort of packaging. Inedible examples include eggshells, bones, tea bags, coffee grounds, orange peels, and corn husks.
Food	28	Food - Unpackaged Edible	The portions of food typically consumed by humans if that food is loose and free of any packaging or container.
Food	29	Food - Unpackaged Inedible	The portions of food not typically consumed by humans if that food is loose and free of any packaging or container. Inedible examples include eggshells, bones, tea bags, coffee grounds, orange peels, and corn husks.
Food	30	Beverages	Liquids meant for human consumption.
Yard Debris	31	Leaves & Grass	Plant material, except woody material, from any public or private landscape. Examples include leaves, grass clippings, plants, and seaweed. This type does not include woody material or material from agricultural sources.
Yard Debris	33	Woody Yard Debris	Woody plant material, branches, and stumps from any public or private landscape.

Material Class	Material ID	Material Name	Definition
Other Organics	34	Manures	Manure and soiled bedding materials from large domestic, farm, or ranch animals. Examples include manure and soiled bedding from animal production operations, racetracks, riding stables, animal hospitals, and other sources. Does not include feces from small household pets such as dogs and cats.
Other Organics	35	Reusable Clean Wood	Any item made mostly or entirely of wood that is free of paint, stain, glue, or other chemicals. These items may contain nails or other trace contaminants. Includes scrap from production of prefabricated wood products such as wood furniture or cabinets if the pieces are greater than six (6) feet in length. Also includes untreated and unpainted fencing, unpainted new or demolition dimensional lumber (2x4s, 2x6s, 2x12s), untreated or unpainted wood roofing, and wood siding if the pieces are greater than six (6) feet in length. Includes unbroken, whole, and unpainted pallets and crates.
Other Organics	36	Other Clean Wood	Any item made mostly or entirely of wood that is free of paint, stain, glue, or other chemicals that does not meet the reusable criteria. This includes broken pallets and crates and other pieces of wood less than six (6) feet in length.
Other Organics	37	Remainder/ Composite Organic - Compostable	Organic material that cannot be put in any other type that is compostable. Examples include cork, hemp rope, hair, small wood products (such as Popsicle sticks and toothpicks), sawdust, straw baskets, and agricultural crop residues.
Other Organics	38	Remainder/ Composite Organic - Non-compostable	Remainder/Composite Organic - Non-compostable means organic material that cannot be put in any other type that is not compostable. This type includes items made mostly of organic materials but combined with other material types. Examples include rubber items, cigarette butts, cosmetics, any item made mostly of wood that has been contaminated with paint, stain, chemicals or glue (such as painted wood, engineered wood, treated fence posts), household pet feces, clumping kitty litter, household pet bedding like cedar shavings, and animal carcasses.

Material Class	Material ID	Material Name	Definition
Special Materials	39	Reusable Inert Construction Debris	Inerts and other material used in construction **that appear unbroken or whole** such as concrete, asphalt paving, asphalt roofing, and rock, soil & fines, etc. This type may include items from different types combined, which would be very hard to separate. Examples include brick, construction ceramics such as tiles, toilets and sinks, tiles, toilets, sinks, dried paint not attached to other materials, fiberglass insulation, and carpet padding. This type may also include demolition debris that is a mixture of items such as plate glass, wood, tiles, gypsum board (AKA plasterboard or drywall), synthetic counter tops, fiber or composite acoustic ceiling tiles, and aluminum scrap.
Special Materials	40	Other Inert Construction Debris	Inerts and other material used in construction that **are not** unbroken or whole such as concrete, asphalt paving, asphalt roofing, and rock, soil & fines, etc. This type may include items from different types combined, which would be very hard to separate. Examples include brick, construction ceramics such as tiles, toilets and sinks, tiles, toilets, sinks, dried paint not attached to other materials, fiberglass insulation, and carpet padding. This type may also include demolition debris that is a mixture of items such as plate glass, wood, tiles, gypsum board (AKA plasterboard or drywall), synthetic counter tops, fiber or composite acoustic ceiling tiles, and aluminum scrap.
Special Materials	41	Carpet	Flooring applications consisting of various natural or synthetic fibers bonded to some type of backing material. This type does not include carpet padding or woven rugs with no backing.
Special Materials	42	E-waste	Most items with an external or internal power source and extensive circuitry. Items typically have more than a simple on/off switch and include programming to achieve multiple modes of operation or include any sort readout or display. Examples include mobile phones, GPS, calculators, printers, computers (without a video display device incorporated), vacuum cleaners, sewing machines, microwaves, irons, toasters, electric knives, shavers, hair care, toys, some musical equipment, slot machines, large printing machines, large exercise equipment, cathode ray tube containing devices (CRT

Material Class	Material ID	Material Name	Definition
			devices), cathode ray tubes (CRTs), computer monitors containing CRTs, laptop computers with liquid crystal display (LCD), LCD containing desktop monitors, televisions containing CRTs, televisions containing LCD screens, plasma televisions, portable DVD players with LCD screens, tablet computers (like the iPad and Kindle Fire), and solar panels.
Special Materials	43	Household Hazardous Waste	Household items that are caustic, toxic, explosive, or otherwise harmful that may cause problems if handled in via traditional waste collection, landfilling, or incineration. Examples include paint, batteries, automotive fluids, propane cylinders, pharmaceuticals (prescription and OTC), sharps, pesticides, mercury containing items, and fluorescent lamps.
Special Materials	44	Special Waste	Bulky items and other waste requiring special handling. Examples include furniture made of mixed material types, asbestos containing materials, medical waste (treated or not, excluding sharps), or artificial fireplace logs.
Special Materials	45	Tires	Any kind of wheels rubber tire. May be solid or inflatable. Examples include car, bicycle, scooter, tractor, motorcycle, wheelbarrow, and heavy equipment tires. Does not include tires still attached to a rim. Excludes tracks from tracked vehicles such as skid steers or snowmobiles.
Special Materials	46	Refrigerant-containing items	Items that can be reasonably expected to contain a gaseous refrigerant. Examples include refrigerators, freezers, and air conditioners.
Special Materials	47	Mattresses	Any cushioned sleeping surface. Includes coil spring, latex/foam, and futon (cotton) mattresses. Does not include inflatable or water filled mattresses.
Special Materials	48	Reusable Wood Furniture	Furniture made exclusively (apart from small amount of trim, adhesive, and nails) from wood. May be painted/stained or unpainted. Items appear whole or unbroken.

Material Class	Material ID	Material Name	Definition
Special Materials	49	Broken Wood Furniture	Furniture made exclusively (apart from small amount of trim, adhesive, and nails) from wood. May be painted/stained or unpainted. Items appear to be broken.
Special Materials	50	Reusable Metal Furniture	Furniture made exclusively (apart from small amount of trim and adhesive) from metal. May be painted/stained or unpainted. Items appear whole or unbroken.
Special Materials	51	Broken Metal Furniture	Furniture made exclusively (apart from small amount of trim and adhesive) from metal. May be painted/stained or unpainted. Items appear to be broken.
Textiles	52	Textiles - Organic	Cloth, clothing, sheets and towels, other textile items, and rope made of 100 percent cotton, leather, wool or other naturally-occurring fibers. Composites of several different naturally-occurring fibers (such as a wool jacket with a cotton liner) can be included in this material, as can organic textiles with buttons and zippers.
Textiles	53	Textiles - Synthetic, Mixed, & Unknown	Cloth, clothing, sheets and towels, other textile items, shoes, clothing accessories (purses), and rope made of unknown fibers, synthetic fibers or made from a mixture of synthetic and natural materials.
Other Materials	54	Fines	Any items that pass through a 2-inch screen while sorting.
Other Materials	55	Mixed Residue	Material that cannot be put in any other type or category. Examples inorganic items that cannot be put in any other type, such as kitchen ceramics, synthetic rubber products such as kitchen and other gloves, partially filled containers of non-food consumer products, dryer and Swiffer sheets, single use diapers and sanitary products, "trucker bottles", and materials that cannot be put in any other material type or the various remainder/composite types described for each broad material type (plastic, glass, etc.).

Appendix C: Estimating Waste Composition

This section describes the methods used to calculate waste composition estimates in this study. Estimates were calculated using a method that gave equal weighting or "importance" to each sample within a given stratum. Confidence intervals (error ranges) were calculated based on assumptions of normality in the composition estimates.

For a given stratum, the composition estimate denoted by "r_j" represents the ratio of the material type weight to the total weight of all the samples in the stratum. This estimate is derived by summing the weight of each material type across all the selected samples belonging to a given stratum and dividing by the sum of the total weight of all the samples in that stratum, as shown in the following equation:

$$r_j = \frac{\sum_i c_{ij}}{\sum_i w_i} \quad (1)$$

where:

- r_j = composition estimate for material *j* (*r* stands for *ratio*)
- *c* = weight of particular material type
- *w* = sum of all material type weights
- for *i* = 1 to *n*, where *n* = number of selected samples
- for *j* = 1 to *m*, where *m* = number of material types

For example, the following simplified scenario involves three samples. For the purposes of this example, only the weights of *manures* are shown.

	Sample 1	Sample 2	Sample 3
Weight (*c*) of *manures*	5	3	4
Total Sample Weight (*w*)	80	70	90

$$r_{Manures} = \sum \frac{5+3+4}{80+70+90} = 0.05$$

To find the composition estimate for the *manures*, the weights for that material are added for all.

The confidence interval for this estimate is derived in two steps. First, the variance around the estimate is calculated, accounting for the fact that the ratio includes two random variables (the material type and total sample weights). The variance of the ratio estimator equation follows:

$$\mathrm{Var}(r_j) \approx \left(\frac{1}{n}\right)\left(\frac{1}{\overline{w}^2}\right)\left(\frac{\sum_i \left(c_{ij} - r_j w_i\right)^2}{n-1}\right) \quad (2)$$

where:

$$\overline{w} = \frac{\sum_i w_i}{n} \quad (3)$$

(For more information regarding Equation 2, refer to *Sampling Techniques, 3rd Edition* by William G. Cochran [John Wiley & Sons, Inc., 1977].)

Second, the error range at the 90% confidence level is calculated for a material type's mean as follows:

$$r_j \pm \left(z\sqrt{\mathrm{Var}(r_j)}\right) \quad (4)$$

where z = the value of the z-statistic (1.645) corresponding to a 90% confidence level.

Composition results for strata are combined, using a weighted averaging method, to estimate the composition of larger portions of the disposed waste stream. For example, the commercial packer and commercial roll-off subsectors are combined to estimate the composition of Juneau's overall commercial disposed waste stream. The relative tonnages associated with each stratum serve as the weighting factors. The calculation are performed as follows:

$$O_j = \left(p_1 * r_{j1}\right) + \left(p_2 * r_{j2}\right) + \left(p_3 * r_{j3}\right) + \ldots$$

where:

- p = the proportion of tonnage contributed by the noted waste stratum (the weighting factor);
- r = ratio of component weight to total waste weight in the noted waste stratum (the composition percent for the given material component); and
- for j = 1 to m, where m = number of material components.

For example, the above equation is illustrated here using three waste strata.

	Stratum 1	Stratum 2	Stratum 3
Ratio (*r*) of *manures*	5%	10%	10%
Tonnage	25,000	100,000	50,000
Proportion of tonnage (*p*)	14.3%	57.1%	28.6%

To estimate the larger portions of the disposed waste stream, the composition results for the three strata are combined as follows.

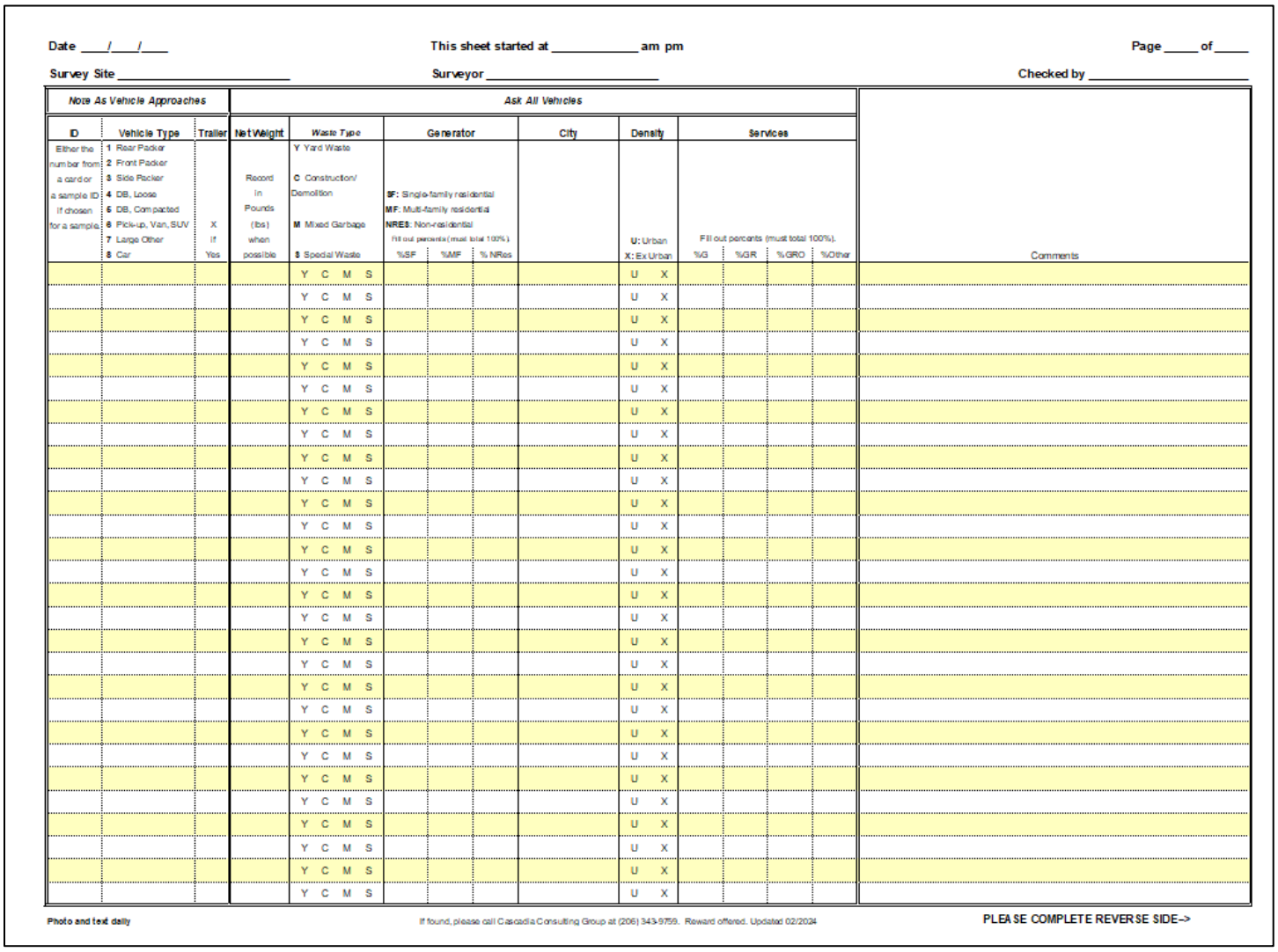
$$O_{Carpet} = (0.143 * 0.05) + (0.571 * 0.10) + (0.286 * 0.10) = 0.093 = 9.3\%$$

The variance of the weighted average is calculated as follows:

$$\mathrm{Var}(O_j) = \left(p_1^2\ \mathrm{Var}(r_{j1})\right) + \left(p_2^2\ \mathrm{Var}(r_{j2})\right) + \left(p_3^2\ \mathrm{Var}(r_{j3})\right) + \ldots$$

Appendix D: Field Forms

Figure 16. Vehicle Survey Sheet



Date ___/___/___ This sheet started at _____ am pm Page ____ of ____

Survey Site _____ Surveyor _____ Checked by _____

Note As Vehicle Approaches			*Ask All Vehicles*											
ID	Vehicle Type	Trailer	Net Weight	*Waste Type*	Generator			City	Density	Services				
Either the number from a card or a sample ID if chosen for a sample.	1 Rear Packer 2 Front Packer 3 Side Packer 4 DB, Loose 5 DB, Compacted 6 Pick-up, Van, SUV 7 Large Other 8 Car	X if Yes	Record in Pounds (lbs) when possible	Y Yard Waste C Construction/ Demolition M Mixed Garbage S Special Waste	SF: Single-family residential MF: Multi-family residential NRES: Non-residential Fill out percents (must total 100%) %SF	%MF	% NRes		U: Urban X: Ex Urban	Fill out percents (must total 100%). %G	%GR	%GRO	%Other	Comments
				Y C M S					U X					
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Photo and text daily

If found, please call Cascadia Consulting Group at (206) 343-9759. Reward offered. Updated 02/2024

PLEASE COMPLETE REVERSE SIDE-->

Figure 17. Vehicle Survey Script

AS THE VEHICLE APPROACHES:

Select a numbered card; record the number.

Decide whether the vehicle is a commercial hauler or self-haul and record the collection type.

Observe and record the vehicle type (from the list on the survey form; ask driver if you are uncertain).

Observe and record whether they are pulling a trailer ("X" if yes).

STOP THE VEHICLE, THEN BEGIN QUESTIONS:

Introduction: "Hello, the city is conducting a customer survey today."

Ask the driver whether the load is yard waste, construction and demolition debris (C&D), MSW/mixed garbage, or special waste. Record the waste type.

If the waste type is yard waste or C&D, ask the driver if they are a contractor/builder or a landscaper. Record only if they are a contractor/builder or landscaper.

Ask the driver where the load was generated: single family residential, multifamily residential, mixed residential, mixed residential and nonresidential, or nonresidential (business/institutional). Record the percentage of generator type.

Record any additional comments the driver may offer. Thank the driver for their time and responses.

Hand the driver the numbered card. "This card will be collected when you leave the facility. Please don't leave without returning the card."

AS THE VEHICLE DEPARTS THE FACILITY:

Remove the numbered card and ask for the transaction receipt. You will record the net weight on the survey form, making sure to write it next to the correct numbered card number.

Figure 18. Sample Placard

Juneau WCS 2024

101 **5/_ _ /2024**	**Generator** Single Family Multi-Family Roll Off Commercial Self-haul
Hand Sort Visual Sort Cell #:3	
Notes:	

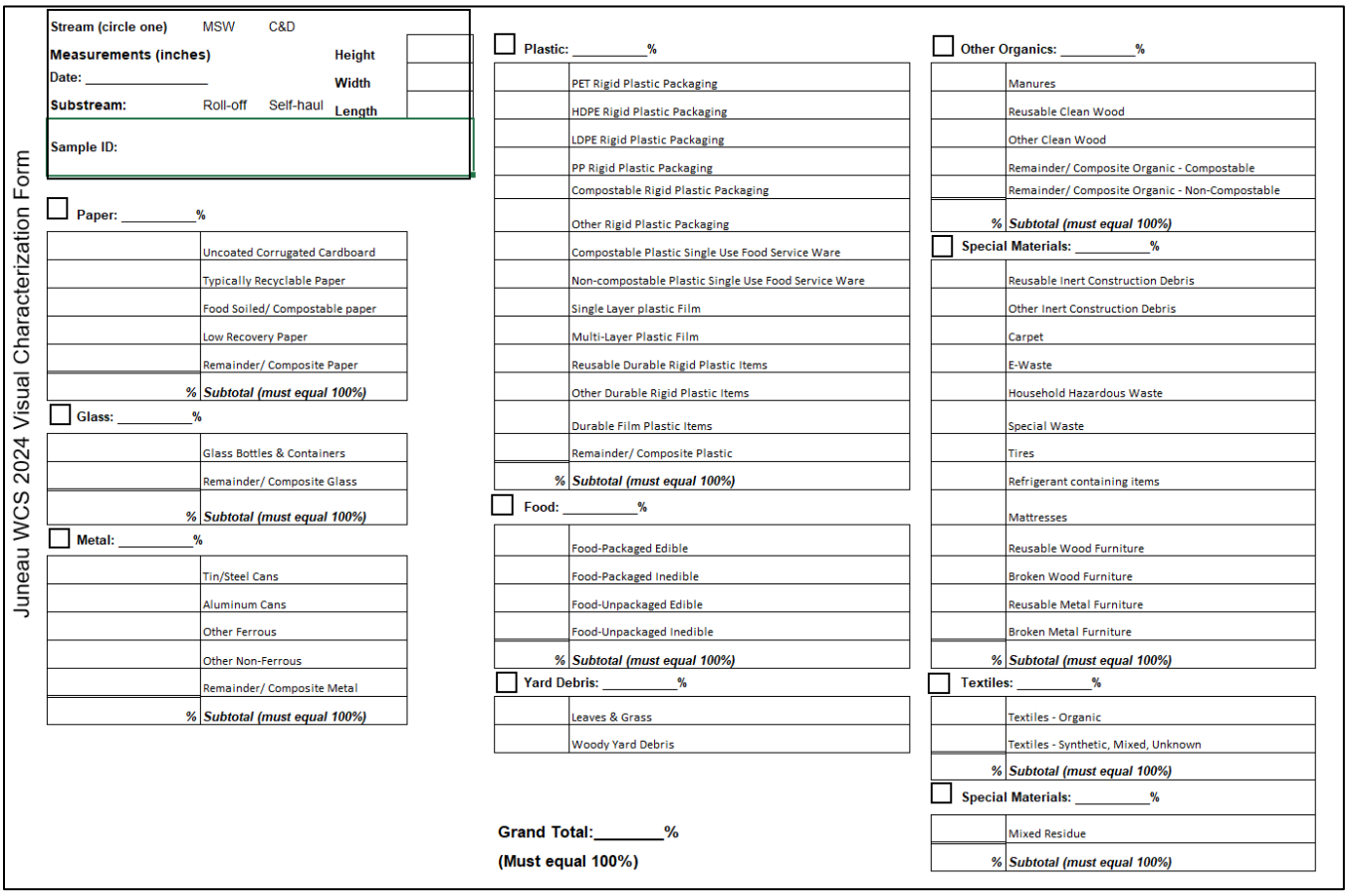
Figure 19. Sample Tracking Form

Sample Tracking Sheet

Juneau WCS 2024

Sampled? (Y or N)	Hand-sort /Visual?	Sorted?	Sample ID	Date	Generator (SF,MF,Com,RO,SH)	Notes
			101			
			102			
			103			
			104			
			105			
			106			
			107			
			108			
			109			
			110			
			111			
			112			
			113			

Figure 20. Visual Tally Sheet



Juneau WCS 2024 Visual Characterization Form

Stream (circle one)	MSW C&D
Measurements (inches)	**Height**
Date: _____	**Width**
Substream:	Roll-off Self-haul **Length**
Sample ID:	

☐ **Paper: _____%**

	Uncoated Corrugated Cardboard
	Typically Recyclable Paper
	Food Soiled/ Compostable paper
	Low Recovery Paper
	Remainder/ Composite Paper
%	***Subtotal (must equal 100%)***

☐ **Glass: _____%**

	Glass Bottles & Containers
	Remainder/ Composite Glass
%	***Subtotal (must equal 100%)***

☐ **Metal: _____%**

	Tin/Steel Cans
	Aluminum Cans
	Other Ferrous
	Other Non-Ferrous
	Remainder/ Composite Metal
%	***Subtotal (must equal 100%)***

☐ **Plastic: _____%**

	PET Rigid Plastic Packaging
	HDPE Rigid Plastic Packaging
	LDPE Rigid Plastic Packaging
	PP Rigid Plastic Packaging
	Compostable Rigid Plastic Packaging
	Other Rigid Plastic Packaging
	Compostable Plastic Single Use Food Service Ware
	Non-compostable Plastic Single Use Food Service Ware
	Single Layer plastic Film
	Multi-Layer Plastic Film
	Reusable Durable Rigid Plastic Items
	Other Durable Rigid Plastic Items
	Durable Film Plastic Items
	Remainder/ Composite Plastic
%	***Subtotal (must equal 100%)***

☐ **Food: _____%**

	Food-Packaged Edible
	Food-Packaged Inedible
	Food-Unpackaged Edible
	Food-Unpackaged Inedible
%	***Subtotal (must equal 100%)***

☐ **Yard Debris: _____%**

	Leaves & Grass
	Woody Yard Debris

Grand Total:_____%

(Must equal 100%)

☐ **Other Organics: _____%**

	Manures
	Reusable Clean Wood
	Other Clean Wood
	Remainder/ Composite Organic - Compostable
	Remainder/ Composite Organic - Non-Compostable
%	***Subtotal (must equal 100%)***

☐ **Special Materials: _____%**

	Reusable Inert Construction Debris
	Other Inert Construction Debris
	Carpet
	E-Waste
	Household Hazardous Waste
	Special Waste
	Tires
	Refrigerant containing items
	Mattresses
	Reusable Wood Furniture
	Broken Wood Furniture
	Reusable Metal Furniture
	Broken Metal Furniture
%	***Subtotal (must equal 100%)***

☐ **Textiles: _____%**

	Textiles - Organic
	Textiles - Synthetic, Mixed, Unknown
%	***Subtotal (must equal 100%)***

☐ **Special Materials: _____%**

	Mixed Residue
%	***Subtotal (must equal 100%)***