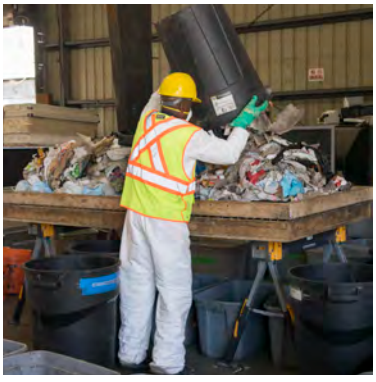
2018 Facility-Based Characterization of Solid Waste in California

May 15, 2020

Field Work Produced Under Contract by CASCADIA CONSULTING GROUP



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Acknowledgments

This study would not have been possible without the cooperation and assistance of solid waste management companies, solid waste facilities, waste haulers, and apartment managers and owners throughout the state of California who generously agreed to participate in this effort.

Executive Summary

In 2018, the California Department of Resources Recycling and Recovery (CalRecycle) completed the fifth statewide waste characterization study. CalRecycle contracted with Cascadia Consulting Group to characterize and quantify the disposed waste stream into 94 material types for the commercial, residential, and self-haul sectors in California.

CalRecycle and Cascadia designed a study that incorporated the following: statistically representative analyses, cost-effective sampling, and processes for gathering data that were not disruptive to facility operators or their customers. The previous four statewide studies used a similar methodology; however, the scope of materials for the 2018 study was updated to include new material types related to food waste and packaging-related materials.

In addition, this study also characterized processing residuals from materials recovery facilities (MRFs) to estimate the quantity and composition of residuals generated from four types of MRFs in two regions of the state. CalRecycle's most recent MRF residual study was completed in 2006, and this 2018 data gives an updated picture of residuals disposed from the recycling stream. The information can be used to evaluate potential policy and technology changes that may improve processing with the goal to further increase diversion.

Additionally, in previous statewide studies food waste was sorted as a single material category. To obtain detailed data on the different quantities and types of food waste disposed in California landfills, this study measured eight separate categories of food waste based on the potential edibility of this food. The eight food waste categories also include 'potentially donatable' material types to help inform the measurement of potentially donatable or recoverable food that is disposed in California landfills each year. This data will also be used to help determine the edible food baseline for SB 1383.

For calendar year 2018, the franchised residential sector generated 28.6 percent and the franchised commercial sector generated 41.9 percent of the disposed waste stream statewide. The self-hauled sector generated the remaining 29.5 percent.

Organic materials continued to be a large part of the waste disposed in California landfills, and accounted for more than one-third of the statewide disposed waste stream (34 percent). *Food - Not Donatable - Non-Meat* was the most prevalent material type in the entire disposed waste stream at 9.5 percent (64 percent of all food material types). For more information regarding this material type, please see Appendix B: List and Definitions of Material Types.

This report presents the findings of the 2018 Statewide Waste Characterization Study.

Methods

To estimate statewide disposal, a stratified random sampling methodology was used to sample waste from numerous subgroups (strata) to develop a waste composition profile for each stratum. Strata considered in this study included the geographical region, the waste sector (franchised residential, franchised commercial, or self-hauled), and the waste subsectors (single-family residential and multi-family residential). The strata were then "added together" in a way that reflects each stratum's relative contribution to the overall waste stream, thus producing overall waste composition information.

This study considered single-family residential waste separately from multi-family residential waste. Multi-family waste is typically collected along with commercial waste, and it becomes impractical to separate the multi-family from the commercial waste for sampling at solid waste sites. The study therefore captured multi-family waste at the point of generation (apartment complexes).

The state was divided into five regions defined by similarities in demographic, climatic, geographic, and economic characteristics. Waste composition data were gathered from 892 waste samples that the field crew sorted at 34 solid waste facilities (landfills and transfer stations) and 40 apartment complexes. The distribution of waste samples was based on each region's contribution to the overall statewide disposal tonnage. Please note that these statewide estimates do not incorporate tonnage designated as beneficial reuse, biosolids, and disaster debris.

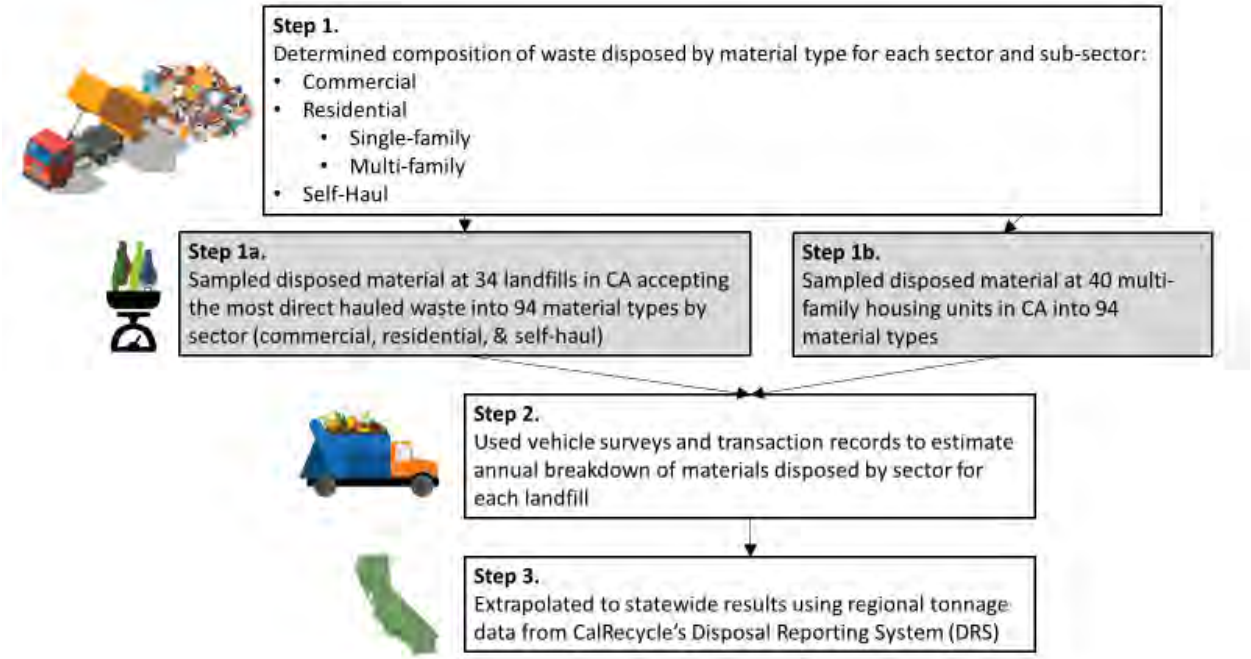
Samples of single-family residential waste, commercial waste, and self-haul waste were obtained from randomly selected vehicles at participating facilities. Samples of multi-family residential waste were collected at multi-family complexes that were selected through the procedure outlined in Appendix A: Detailed Methodology (Selection, Recruitment and Logistics for Sampling Sites). The methods used to select, sort, and analyze samples from sectors and subsectors is described in Appendix A: Detailed Methodology.

The sampled waste was sorted into 94 material types. Most material types were chosen and defined such that they can be compared to the material types used during California's 2014 Statewide Waste Characterization Study. These materials are described in more detail in Appendix B: List and Definitions of Material Types.

As part of the study, vehicle surveys were conducted with drivers at participating solid waste facilities to determine the waste-generating sector and the net weight of each load, among other data. Results from these surveys were used to estimate the portion of California's disposed waste derived from each waste sector and subsector. Surveys were conducted prior to sampling days at the site. All vehicles bringing disposed waste to the study facilities were surveyed, for a total of 5,265 surveys completed over the study period.

CalRecycle's Disposal Reporting System (DRS) state disposal data was used to extrapolate statewide tonnage estimates. Waste composition data was used to determine tons per material type and vehicle surveys were used to distribute disposal tons per sector.

Figure 1. Overview of Selection and Recruitment for Sampling Sites



The same 94 material types mentioned previously were also used to characterize processing residuals from MRFs. The study selected MRFs belonging in one of four categories: mixed waste processing, clean recyclables (single and dual-stream), organics processing, and construction and demolition (C&D). Nine facilities were sampled, representing a total of ten MRFs (one facility could operate two types of MRFs). Residual streams were characterized by sorting waste from every MRF's ejection point. The resulting data was combined to characterize residual composition from each type of MRF.

For more information regarding study methodology, please see Appendix A: Detailed Methodology.

Data Limitations

Due to the inclusion of new material types in the 2018 study, the material list is not directly comparable to the 2014 material list. Several material types from 2014 have been separated into more granular material types in the 2018 study. Additionally, several materials have changed classification (i.e. organic to inerts and others). The two studies are very similar, but it will be difficult to compare certain material types.

Materials mentioned in legislation may not be the classified the same way as the scope of materials for the 2018 study. For example, materials defined as organic in the 2018 study may not be classified as organic in some laws.

While the 2018 waste characterization study collected data at the county and regional level, the results presented in this report should only be considered as a statewide average. The regional and county data collected in the study does not contain sufficient granular data and the resulting calculations are not statistically robust to present local data.

Waste sectors (otherwise known as “source sectors”) were neither collected nor applied to MRF residual characterization data. Additionally, statewide estimates are not presented. The MRF residual characterization data is not intended to be extrapolated into a statewide estimate, but rather provide a general characterization of residuals from different types of MRFs in California.

Results

This report includes detailed findings for the following areas:

- Disposed waste composition and tonnage for the state’s overall waste stream and the commercial, residential, and self-hauled sectors.
- Disposed waste composition and tonnage for the state’s single-family residential waste and multi-family residential waste subsectors.
- Characterization data for the MRF processing residual waste stream for four MRF types (mixed waste processing, clean recyclables, organics processing, construction and demolition) in the Southern California and Bay Area regions.

How Data Is Presented

For the overall disposed waste stream, and for each waste sector and subsector, data are presented in three ways:

- First, an overview of waste composition by broad material class (e.g. paper, plastic, organics) is presented in both pie chart and tabular formats.
- Second, the 10 most prevalent of the 94 material types by weight are presented in a table.
- Lastly, a detailed table presents the full composition and quantity results for the 94 material types. Refer to Appendix B: List and Definitions of Material Types for a detailed list of material definitions used in the study.

Means and Confidence Intervals

The statewide disposal data were analyzed to provide three kinds of information for each of the material types for total statewide disposal and by sector:

- The estimated annual weight of disposed material;
- The estimated contribution to disposal (percent-by-weight) of each material; and
- The confidence interval for the percentage composition estimates.

For the MRF residual data, only the estimated contribution (percent-by-weight) is reported.

The reported values represent the mean component percentage. All confidence intervals reflect a 90 percent confidence level. The equations used in these calculations can be found in the Description of Calculations and Statistical Procedures Used section of Appendix A: Detailed Methodology.

Rounding

Estimated tonnages presented in the tables are rounded to the nearest ton, and estimated percentages are rounded to the nearest tenth of a percent. Due to this rounding, the tonnages presented in the report may not exactly match the subtotals and totals shown. Similarly, the percentages, may not exactly add up to 100 percent. Percentages less than 0.05 percent are shown as 0.0 percent.

The quantities presented in the tables were calculated using the unrounded percentages. Therefore, using the rounded percentages shown in the tables to calculate quantities will yield quantities that are different than those shown in the report.

Statewide Disposal At a Glance

Table 1 depicts each sector's estimated contribution to the overall waste stream, calculated using 2018 vehicle surveys applied to CalRecycle Disposal Reporting System (DRS) 2018 reported tonnage.

Table 1. Estimated Contribution of Each Sector to California's Overall Disposed Waste Stream

Sector	Est. % of Disposed Waste	Est. Tons Disposed Statewide
Franchised Commercial*	41.9%	16,467,606
Franchised Residential*	28.6%	14,516,212
Single-family residential	24.0%	*9,421,478*
Multi-family residential	4.6%	*1,810,852*
Self-Hauled	29.5%	11,604,521
Totals**	100%	39,304,457

*Includes waste collected by both private and public entities that provide service to residential and business customers.
**In all figures and tables, percentages may not total 100 due to rounding. For brevity, we do not include this statement in following figures and tables

Figure 2 presents the material composition by material class for total statewide disposal. Each of the 94 material types is considered part of one of the 9 material classes. The pie chart was constructed using sector percentage data obtained from the 2018 vehicle surveys applied to 2018 composition results.

Figure 2. Material Classes in California's Overall Disposed Waste Stream

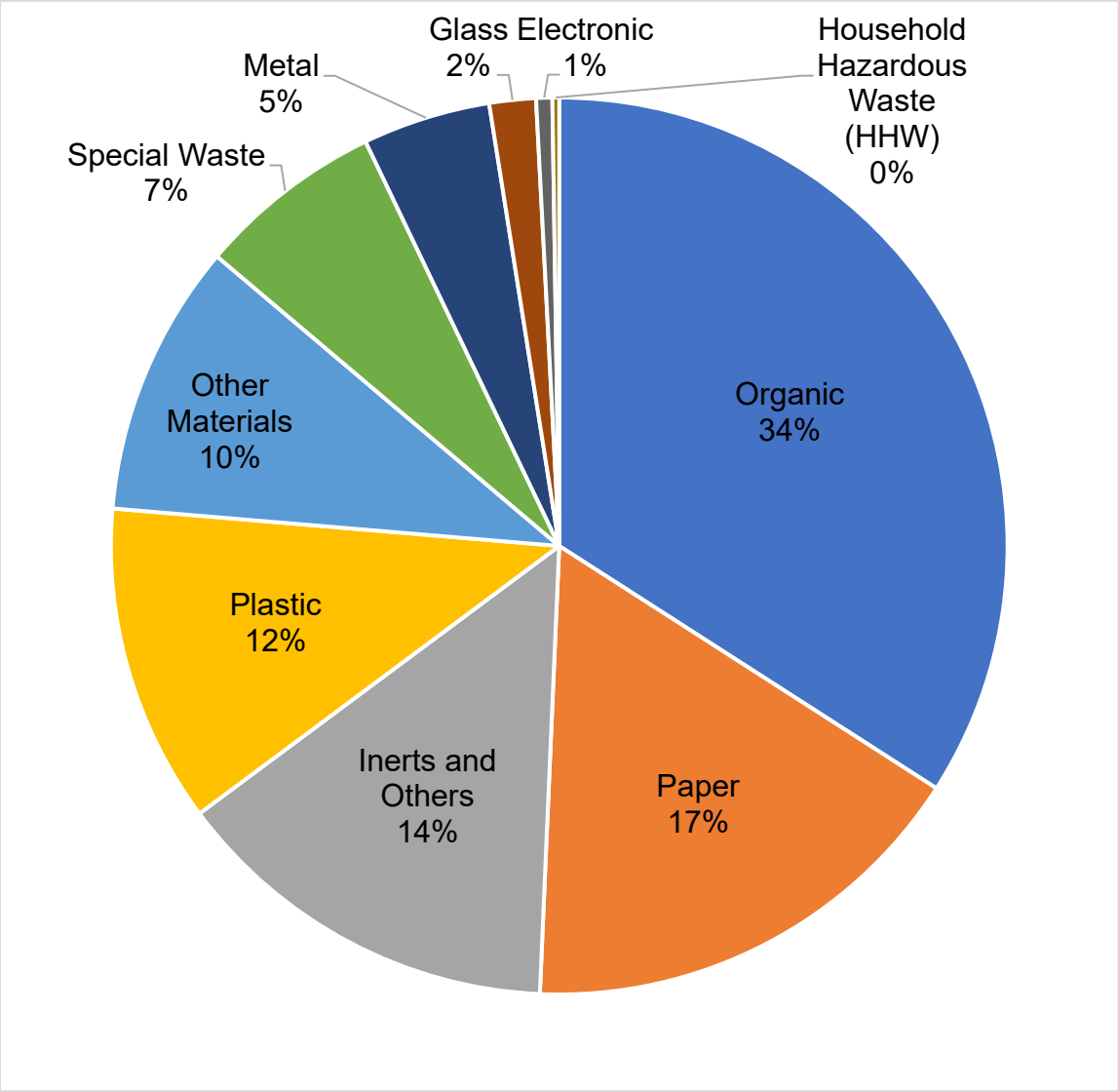


Table 2 presents the 10 most prevalent material types in the overall disposed waste stream. The table was constructed using sector percentage data obtained from the 2018 vehicle surveys applied to 2018 composition results. See Appendix B: List and Definitions of Material Types for definitions of the different material types

Table 2. Ten Most Prevalent Material Types in California's Overall Disposed Waste Stream

Material	Estimated Percent	Cumulative Percent	Estimated Tons
Food - Not Donatable – Non-meat	9.5%	9.5%	3,752,620
Bulky Items	5.3%	14.8%	2,074,965
Uncoated Corrugated Cardboard	5.2%	20.0%	2,037,360
Remainder/Composite Inerts and Other	4.7%	24.7%	1,859,249
Wood Waste - Treated/Painted/Stained	4.4%	29.1%	1,740,699
Compostable Paper - Non-packaging	3.9%	33.0%	1,531,324
Mixed Residue	3.1%	36.1%	1,225,126
Prunings and Trimmings	3.1%	39.2%	1,221,926
Rock, Soil and Fines	2.6%	41.8%	1,018,002
Other Film	2.4%	44.2%	936,713
Total	**44.2%**		**17,397,984**

Key Findings

- The franchised residential sector (including single-family and multi-family) generated 28.6 percent and the franchised commercial sector generated 41.9 percent of the disposed waste stream statewide. The self-hauled sector generated the remaining 29.5 percent. Although the self-hauled sector generated more waste than measured in previously published waste characterization reports, the scope of this study did not extend to identifying specific contributing factors to this increase.
- Organic materials such as food waste, yard waste, and lumber continued to be a large part of the waste disposed in California landfills. As the largest material class, it accounted for more than one-third of the statewide disposed waste stream (34 percent). *Food - Not Donatable - Non-Meat* was the most prevalent material type in the entire disposed waste stream (9.5 percent).
- The next largest material class was paper, which was 16.6 percent of all disposal. About 40 percent of this of this class was *uncoated corrugated cardboard* (the third-largest material type disposed overall); other material types in this class include *compostable paper - non-packaging, newspapers/newspaper inserts,* and *white office-type paper and mail.*
- Inerts and Others was the third-largest material class, at approximately 14.1 percent of disposed waste. *Remainder/Composite Inerts and Others* was the most prevalent material.

Statewide Characterization Results

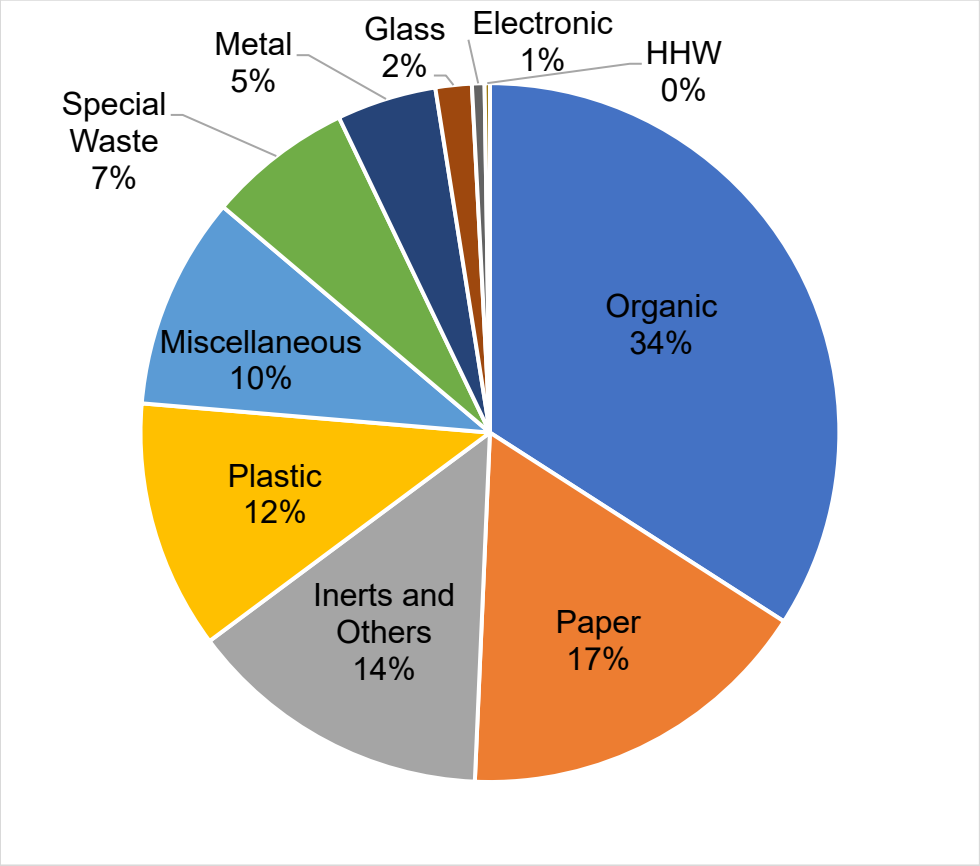
Overall Disposed Waste Stream

This section presents the characterization data for the disposed municipal solid waste stream for the entire state of California, combining all of the sectors and subsectors presented elsewhere in this study.

Composition by Material Class

Composition estimates by material class for the overall waste stream are illustrated in Figure 2. The largest material class in the overall waste stream was organic, which accounted for more than one third (34.1 percent) of the waste stream by weight, followed by paper (16.6 percent) and inerts and others (14.1 percent).

Figure 2. Material Classes in California's Overall Disposed Waste Stream



Ten Most Prevalent Material Types

The ten most prevalent material types in the overall waste stream by weight are presented in Table 3. Combined, these ten material types comprised approximately 44 percent of overall disposed waste.

Table 3. Ten Most Prevalent Material Types in California's Overall Disposed Waste Stream by Weight

Material	Estimated Percent	Cumulative Percent	Estimated Tons
Food - Not Donatable - Non-meat	9.5%	9.5%	3,752,620
Bulky Items	5.3%	14.8%	2,074,965
Uncoated Corrugated Cardboard	5.2%	20.0%	2,037,360
Remainder/Composite Inerts and Other	4.7%	24.7%	1,859,249
Wood - Treated/Painted/Stained	4.4%	29.1%	1,740,699
Compostable Paper - Non-packaging	3.9%	33.0%	1,531,324
Mixed Residue	3.1%	36.1%	1,225,126
Prunings and Trimmings	3.1%	39.2%	1,221,926
Rock, Soil and Fines	2.6%	41.8%	1,018,002
Other Film	2.4%	44.2%	936,713
Total	**44.2%**		**17,397,984**

Detailed Composition

The composition percentages by weight for each material type in California's overall waste stream are listed in Table 4.

Table 4. Material Composition of California's Overall Disposed Waste Stream

Material	Estimated Percent	+ / -	Estimated Tons
Paper	**16.6%**		**6,525,762**
Uncoated Corrugated Cardboard	5.2%	0.2%	2,037,360
Paper Grocery Bags	0.1%	0.0%	29,248
Other Paper Bags/Kraft Paper	0.4%	0.0%	159,212
Newspapers/Newspaper Inserts	0.7%	0.1%	276,453
White Office-type Paper and Mail	0.4%	0.1%	156,662
Magazines and Catalogs	0.4%	0.0%	161,958
Folding Cartons and Other Paperboard Packaging	1.2%	0.0%	457,564
Other Recyclable Paper	1.4%	0.1%	559,779
Miscellaneous Paper Packaging	0.9%	0.1%	352,975
Aseptic Containers	0.1%	0.0%	28,002
Gable-top Cartons	0.1%	0.0%	46,766
Compostable Paper - Packaging	1.3%	0.1%	515,393
Compostable Paper - Non-packaging	3.9%	0.1%	1,531,324
Remainder/Composite Paper - Other	0.5%	0.1%	213,067
Glass	**1.7%**		**658,952**
Clear Glass Bottles and Containers - CRV	0.4%	0.0%	157,110
Clear Glass Bottles and Containers - Non-CRV	0.5%	0.0%	182,580
Green Glass Bottles and Containers - CRV	0.1%	0.0%	25,814
Green Glass Bottles and Containers - Non-CRV	0.3%	0.0%	111,804
Brown Glass Bottles and Containers - CRV	0.2%	0.0%	81,903
Brown Glass Bottles and Containers - Non-CRV	0.0%	0.0%	16,805
Other Colored Glass Bottles and Containers	0.0%	0.0%	6,331
Remainder/Composite Glass	0.2%	0.0%	76,605
Metal	**4.6%**		**1,811,134**
Remainder/Composite Metal	1.0%	0.2%	388,923
Other Ferrous	1.0%	0.1%	408,151
Aluminum Cans - CRV	0.1%	0.0%	52,830
Tin/Steel Cans	0.8%	0.1%	299,777
Major Appliances	0.5%	0.1%	194,962
Aluminum Cans - Non-CRV	0.0%	0.0%	5,415
Other Non-Ferrous	1.2%	0.1%	461,077
Plastic	**11.5%**		**4,524,052**
PETE Containers - CRV	0.3%	0.0%	128,410
PETE Containers - Non-CRV	0.1%	0.0%	58,855
PETE Containers, Lids, and other Packaging	0.3%	0.0%	113,793
HDPE Containers - CRV	0.0%	0.0%	7,374
HDPE Containers - Non-CRV	0.4%	0.0%	158,020
HDPE Containers, Lids, and other Packaging	0.1%	0.0%	25,748
Polypropylene Containers and Packaging	0.6%	0.0%	242,664
Other Plastic Containers and Packaging	0.3%	0.0%	136,479
Expanded Polystyrene Packaging	0.5%	0.0%	209,172
Plastic Trash Bags	1.7%	0.1%	655,233
Plastic Grocery and Other Merchandise Bags	0.4%	0.0%	139,810
Non-Bag Commercial and Industrial Packaging Film	1.0%	0.1%	393,308
Film Products	0.5%	0.1%	202,512
Flexible Plastic Pouches	0.1%	0.0%	22,059
Other Film	2.4%	0.1%	936,713
Durable Plastic Items	1.8%	0.1%	687,944
Remainder/Composite Plastic	1.0%	0.1%	405,956
Electronics	**0.6%**		**228,480**
Large Equipment	0.2%	0.0%	86,218
Consumer Electronics and Small Equipment	0.3%	0.1%	127,308
Covered Video Display Devices	0.0%	0.0%	14,954

Table 4 (continued). Material Composition of California's Overall Disposed Waste Stream

Material	Estimated Percent	+ / -	Estimated Tons
Organic	**34.1%**		**13,397,041**
Food - Potentially Donatable - Vegetative	1.5%	0.2%	577,303
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.2%	0.0%	69,497
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	84,608
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.4%	0.1%	153,255
Food - Potentially Donatable - Packaged Non-perishable	0.6%	0.1%	232,584
Food - Not Donatable - Meat	1.1%	0.1%	436,986
Food - Not Donatable - Non-meat	9.5%	0.3%	3,752,620
Food - Inedible	1.4%	0.1%	552,682
Leaves and Grass	2.3%	0.2%	905,885
Prunings and Trimmings	3.1%	0.3%	1,221,926
Branches and Stumps	1.5%	0.2%	608,127
Manures	0.6%	0.2%	254,093
Clean Dimensional Lumber	2.0%	0.2%	802,353
Clean Engineered Wood	2.2%	0.2%	875,510
Clean Pallets and Crates	2.2%	0.2%	872,840
Wood Waste - Treated/Painted/Stained	4.4%	0.3%	1,740,699
Other Recyclable Wood	0.0%	0.0%	13,824
Remainder/Composite Organic	0.6%	0.1%	242,248
Inerts and Other	**14.1%**		**5,556,049**
Concrete	1.5%	0.2%	604,195
Asphalt Paving	0.0%	0.0%	5,077
Asphalt Roofing	1.7%	0.2%	687,155
Gypsum Board	1.9%	0.2%	754,446
Carpet	1.6%	0.2%	627,926
Rock, Soil and Fines	2.6%	0.3%	1,018,002
Remainder/Composite Inerts and Other	4.7%	0.4%	1,859,249
Household Hazardous Waste (HHW)	**0.2%**		**95,996**
Paint	0.0%	0.0%	13,913
Used Oil	0.0%	0.0%	2,994
Lead-acid (Automotive) Batteries	0.0%	0.0%	6,900
Other Batteries	0.0%	0.0%	8,892
One-Pound Propane Gas Cylinders	0.0%	0.0%	1,754
Pharmaceuticals	0.1%	0.0%	21,773
Remainder/Composite Household Hazardous	0.1%	0.0%	39,769
Special Waste	**6.7%**		**2,639,651**
Tires	0.4%	0.2%	161,150
Bulky Items	5.3%	0.4%	2,074,965
Mattresses and Foundations	0.7%	0.1%	265,399
Remainder/Composite Special Waste	0.4%	0.1%	138,137
Miscellaneous	**9.8%**		**3,867,339**
Textiles - Organic	1.1%	0.1%	434,956
Textiles - Synthetic, Mixed, Unknown	1.6%	0.1%	644,473
Textiles - Shoes, Purses, Belts	0.3%	0.0%	120,032
Solar Panels	0.0%	0.0%	1,990
Diapers and Sanitary Products	2.3%	0.1%	895,351
Remainder/Composite Organic - Non-compostable	0.4%	0.1%	147,514
Mixed Residue	3.1%	0.1%	1,225,126
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	1.0%	0.1%	397,895
Totals	**100.0%**		**39,304,457**
Sample Count	**892**		

Franchised Commercial Waste

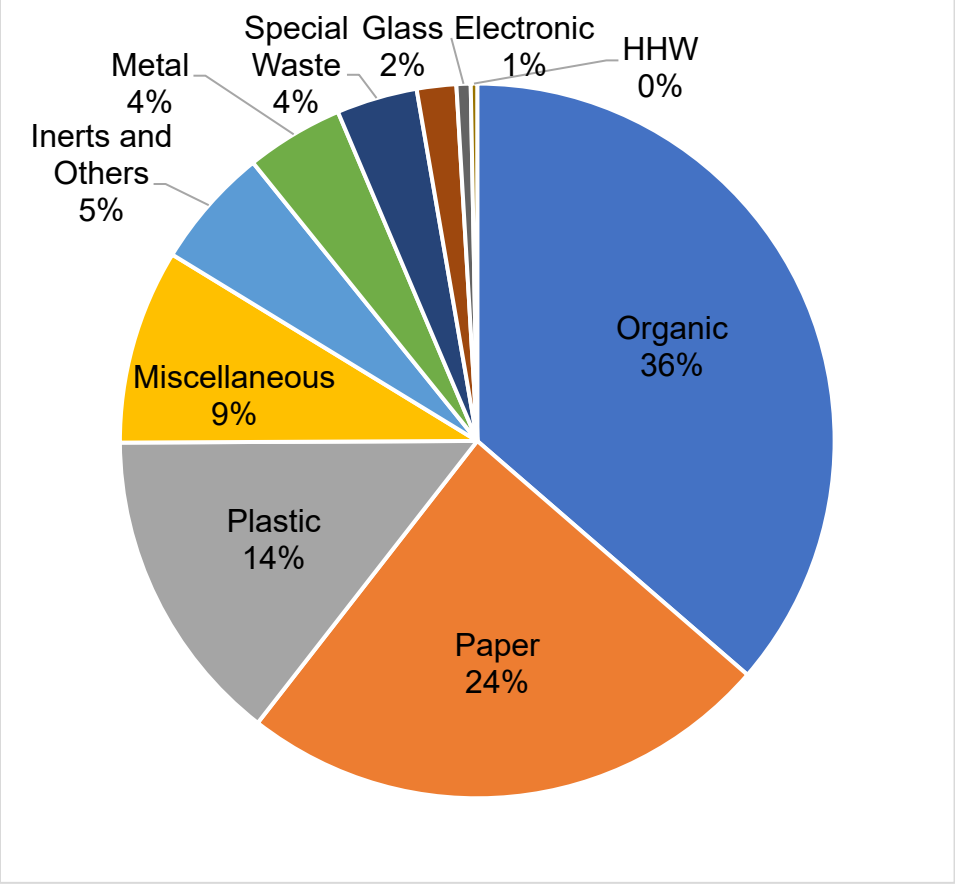
This section presents the characterization data for California's disposed waste from commercial, institutional, and industrial sources. Franchised commercial waste is defined as waste disposed by businesses, industries, and public organizations that is collected and transported by contracted or franchised waste haulers, both private and public (municipal). This includes waste delivered to disposal facilities by both packer trucks serving businesses on regular routes and loose or compacted drop boxes serving individual sites.

Overview and Analysis

As shown in Table 1, the franchised commercial sector accounted for approximately 42 percent of California's municipal solid waste stream. See Appendix A: Detailed Methodology for a description of the methods used in selecting, sorting, and analyzing samples.

Composition results by material class for franchised commercial waste are illustrated in Figure 3 and described in detail in Table 6. The largest material classes in the franchised commercial waste stream were organics and paper, which accounted for about 36 percent and 24 percent of the total, respectively.

Figure 3. Material Classes in Franchised Commercial Disposed Waste



Ten Most Prevalent Materials

The ten most prevalent material types (Table 5) accounted for about 45 percent of franchised commercial waste.

Table 51. Ten Most Prevalent Material Types in Franchised Commercial Disposed Waste by Weight

Material	Estimated Percent	Cumulative Percent	Estimated Tons
Food - Not Donatable - Non-meat	12.0%	12.0%	1,971,705
Uncoated Corrugated Cardboard	9.4%	21.4%	1,553,334
Compostable Paper - Non-packaging	4.9%	26.3%	812,892
Wood Waste - Clean Pallets & Crates	3.9%	30.3%	648,578
Prunings and Trimmings	2.6%	32.9%	432,800
Mixed Residue	2.6%	35.5%	421,878
Food - Potentially Donatable - Vegetative	2.3%	37.8%	386,920
Other Film	2.3%	40.1%	375,865
Compostable Paper - Packaging	2.2%	42.3%	364,421
Non-Bag Commercial and Industrial Packaging Film	2.2%	44.5%	362,954
Total	**44.5%**		**7,331,347**

Detailed Composition

Table 6 presents detailed composition results for the franchised commercial waste stream.

Table 62. Material Composition of Franchised Commercial Disposed Waste

Material	Estimated Percent	+/-	Estimated Tons
Paper	**16.6%**		**3,980,864**
Uncoated Corrugated Cardboard	9.4%	0.5%	1,553,334
Paper Grocery Bags	0.1%	0.0%	10,558
Other Paper Bags/Kraft Paper	0.5%	0.1%	85,591
Newspapers/Newspaper Inserts	0.8%	0.2%	124,008
White Office-type Paper and Mail	0.7%	0.2%	112,958
Magazines and Catalogs	0.4%	0.1%	73,888
Folding Cartons and Other Paperboard Packaging	1.3%	0.1%	212,948
Other Recyclable Paper	1.8%	0.2%	300,645
Miscellaneous Paper Packaging	0.9%	0.1%	145,653
Aseptic Containers	0.1%	0.0%	13,998
Gable-top Cartons	0.2%	0.0%	29,437
Compostable Paper - Packaging	2.2%	0.2%	364,421
Compostable Paper - Non-packaging	4.9%	0.3%	812,892
Remainder/Composite Paper - Other	0.9%	0.2%	140,533
Glass	**1.7%**		**293,879**
Clear Glass Bottles and Containers - CRV	0.4%	0.0%	66,902
Clear Glass Bottles and Containers - Non-CRV	0.5%	0.0%	67,536
Green Glass Bottles and Containers - CRV	0.1%	0.0%	18,730
Green Glass Bottles and Containers - Non-CRV	0.3%	0.1%	65,450
Brown Glass Bottles and Containers - CRV	0.2%	0.0%	39,285
Brown Glass Bottles and Containers - Non-CRV	0.0%	0.0%	5,945
Other Colored Glass Bottles and Containers	0.0%	0.0%	3,375
Remainder/Composite Glass	0.2%	0.0%	26,655
Metal	**4.6%**		**727,929**
Remainder/Composite Metal	1.0%	0.0%	21,843
Other Ferrous	1.0%	0.0%	984
Aluminum Cans - CRV	0.1%	0.2%	84,767
Tin/Steel Cans	0.8%	0.2%	161,249
Major Appliances	0.5%	0.2%	155,047
Aluminum Cans - Non-CRV	0.0%	0.3%	223,056
Other Non-Ferrous	1.2%	0.1%	80,984
Plastic	**11.5%**		**2,370,710**
PETE Containers - CRV	0.3%	0.0%	63,639
PETE Containers - Non-CRV	0.1%	0.0%	19,609
PETE Containers, Lids, and other Packaging	0.3%	0.0%	55,949
HDPE Containers - CRV	0.0%	0.0%	1,652
HDPE Containers - Non-CRV	0.4%	0.1%	86,567
HDPE Containers, Lids, and other Packaging	0.1%	0.0%	18,852
Polypropylene Containers and Packaging	0.6%	0.1%	121,448
Other Plastic Containers and Packaging	0.3%	0.0%	80,092
Expanded Polystyrene Packaging	0.5%	0.1%	107,609
Plastic Trash Bags	1.7%	0.1%	342,379
Plastic Grocery and Other Merchandise Bags	0.4%	0.0%	34,932
Non-Bag Commercial and Industrial Packaging Film	1.0%	0.3%	362,954
Film Products	0.5%	0.3%	100,808
Flexible Plastic Pouches	0.1%	0.0%	8,854
Other Film	2.4%	0.2%	375,865
Durable Plastic Items	1.8%	0.2%	339,476
Remainder/Composite Plastic	1.0%	0.2%	250,024
Electronics	**0.6%**		**105,530**
Large Equipment	0.2%	0.0%	24,225
Consumer Electronics and Small Equipment	0.3%	0.1%	77,302
Covered Video Display Devices	0.0%	0.0%	4,003

Table 6 (continued). Material Composition of Franchised Commercial Disposed Waste

Material	Estimated Percent	+/-	Estimated Tons
Organic	**36.4%**		**5,986,788**
Food - Potentially Donatable - Vegetative	2.3%	0.5%	386,920
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.3%	0.1%	44,859
Food - Potentially Donatable - Animal Meat	0.4%	0.1%	59,875
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.5%	0.2%	80,191
Food - Potentially Donatable - Packaged Non-perishable	0.9%	0.4%	150,239
Food - Not Donatable - Meat	1.7%	0.2%	282,569
Food - Not Donatable - Non-meat	12.0%	0.6%	1,971,705
Food - Inedible	1.9%	0.1%	319,831
Leaves and Grass	1.9%	0.3%	317,711
Prunings and Trimmings	2.6%	0.4%	432,800
Branches and Stumps	0.8%	0.2%	136,348
Manures	1.0%	0.3%	164,734
Clean Dimensional Lumber	1.8%	0.3%	301,163
Clean Engineered Wood	1.7%	0.3%	278,824
Clean Pallets and Crates	3.9%	0.6%	648,578
Wood Waste - Treated/Painted/Stained	2.0%	0.2%	334,537
Other Recyclable Wood	0.0%	0.0%	4,054
Remainder/Composite Organic	0.4%	0.1%	71,850
Inerts and Other	**5.5%**		**901,365**
Concrete	0.7%	0.2%	107,811
Asphalt Paving	0.0%	0.0%	49
Asphalt Roofing	0.1%	0.0%	19,144
Gypsum Board	0.8%	0.2%	125,731
Carpet	1.4%	0.4%	225,347
Rock, Soil and Fines	0.6%	0.3%	96,729
Remainder/Composite Inerts and Other	2.0%	0.3%	326,554
Household Hazardous Waste (HHW)	**0.3%**		**48,118**
Paint	0.0%	0.0%	4,378
Used Oil	0.0%	0.0%	2,336
Lead-acid (Automotive) Batteries	0.0%	0.0%	15
Other Batteries	0.0%	0.0%	2,853
One-Pound Propane Gas Cylinders	0.0%	0.0%	245
Pharmaceuticals	0.1%	0.1%	16,045
Remainder/Composite Household Hazardous	0.1%	0.0%	22,246
Special Waste	**3.7%**		**602,511**
Tires	0.8%	0.3%	128,657
Bulky Items	1.5%	0.2%	241,110
Mattresses and Foundations	0.6%	0.2%	104,303
Remainder/Composite Special Waste	0.8%	0.3%	128,441
Miscellaneous	**8.8%**		**1,449,911**
Textiles - Organic	1.2%	0.2%	205,725
Textiles - Synthetic, Mixed, Unknown	1.4%	0.2%	235,203
Textiles - Shoes, Purses, Belts	0.3%	0.0%	46,784
Solar Panels	0.0%	0.0%	0
Diapers and Sanitary Products	1.2%	0.2%	199,794
Remainder/Composite Organic - Non-compostable	0.6%	0.3%	97,459
Mixed Residue	2.6%	0.1%	421,878
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	1.5%	0.3%	243,068
Totals	**100.0%**		**16,467,606**
Sample Count	**281**		

Franchised Residential Waste

Franchised residential waste is defined as waste disposed by households that is collected and transported by contracted or franchised waste haulers, both private and public (municipal). This section presents composition findings for single-family residential waste and multi-family residential waste.

Overview and Analysis

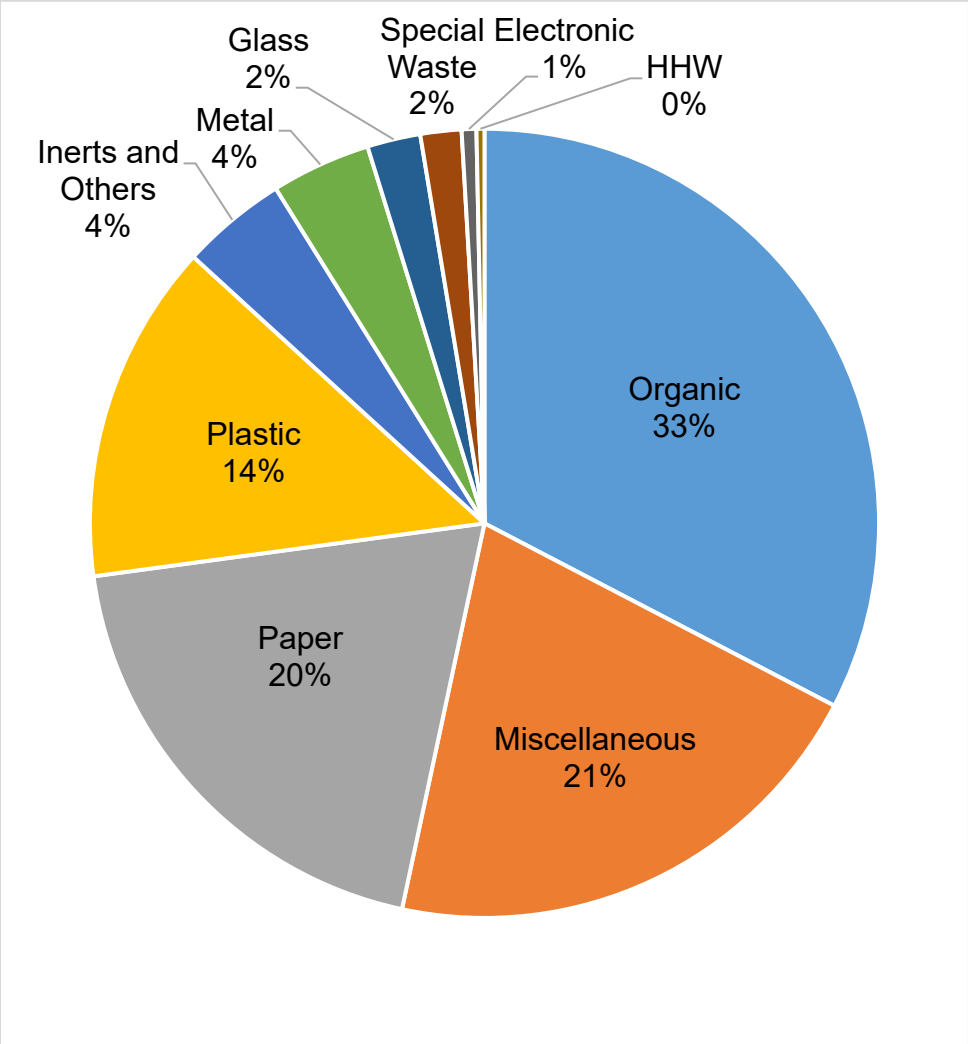
The franchised residential sector accounted for approximately 29 percent of California's municipal solid waste stream. The single-family residential subsector accounted for approximately 24 percent, and the multi-family residential subsector accounted for approximately 5 percent.

Single-Family Residential Waste

The single-family residential waste stream is collected by haulers from single-family residences and is a subsector of the franchised residential waste stream.

Composition results by material class for single-family residential waste are illustrated in Figure 4 and described in detail in Table 8. The largest material class in the single-family residential waste stream was organic, which accounted for nearly 33 percent of the total by weight. Miscellaneous, the next largest material class, accounted for almost 21 percent.

Figure 4. Material Classes in Single-Family Residential Disposed Waste



Ten Most Prevalent Materials

The ten most prevalent material types in the single-family residential waste stream by weight are presented in Table 7. Combined, the top ten material types comprised approximately 51 percent of overall disposed waste.

Table 7. Ten Most Prevalent Material Types in Single-Family Residential Disposed Waste by Weight

Material	Estimated Percent	Cumulative Percent	Estimated Tons
Food - Not Donatable - Non-meat	14.2%	14.2%	1,337,106
Mixed Residue	6.9%	21.1%	649,942
Compostable Paper - Non-packaging	6.7%	27.7%	627,316
Diapers & Sanitary Products	6.3%	34.0%	591,089
Textiles – Synthetic, Mixed, Unknown	3.6%	37.6%	340,794
Leaves and Grass	3.2%	40.8%	299,253
Prunings and Trimmings	3.1%	43.9%	291,231
Other Film	2.8%	46.7%	263,928
Durable Plastic Items	2.5%	49.2%	232,044
Other Recyclable Paper	2.3%	51.4%	212,305
Total	**51.4%**		**4,845,008**

Detailed Composition

Table 8 presents the detailed composition results for the single-family residential subsector.

Table 83. Material Composition of Single-Family Residential Disposed Waste

Material	Estimated Percent	+ / -	Estimated Tons
Paper	**19.5%**		**1,837,373**
Uncoated Corrugated Cardboard	2.1%	0.2%	195,045
Paper Grocery Bags	0.1%	0.0%	13,907
Other Paper Bags/Kraft Paper	0.6%	0.0%	60,853
Newspapers/Newspaper Inserts	1.1%	0.1%	104,599
White Office-type Paper and Mail	0.4%	0.1%	36,339
Magazines and Catalogs	0.7%	0.1%	68,210
Folding Cartons and Other Paperboard Packaging	2.2%	0.1%	206,421
Other Recyclable Paper	2.3%	0.1%	212,305
Miscellaneous Paper Packaging	1.4%	0.1%	136,357
Aseptic Containers	0.1%	0.0%	12,070
Gable-top Cartons	0.1%	0.0%	13,642
Compostable Paper - Packaging	1.4%	0.1%	127,330
Compostable Paper - Non-packaging	6.7%	0.2%	627,316
Remainder/Composite Paper - Other	0.2%	0.0%	22,980
Glass	**2.2%**		**205,593**
Clear Glass Bottles and Containers - CRV	0.5%	0.0%	42,924
Clear Glass Bottles and Containers - Non-CRV	0.7%	0.1%	65,244
Green Glass Bottles and Containers - CRV	0.1%	0.0%	5,479
Green Glass Bottles and Containers - Non-CRV	0.4%	0.1%	40,499
Brown Glass Bottles and Containers - CRV	0.3%	0.1%	30,662
Brown Glass Bottles and Containers - Non-CRV	0.1%	0.0%	5,698
Other Colored Glass Bottles and Containers	0.0%	0.0%	1,233
Remainder/Composite Glass	0.1%	0.0%	13,854
Metal	**4.1%**		**384,389**
Remainder/Composite Metal	1.0%	0.0%	94,985
Other Ferrous	0.5%	0.2%	45,155
Aluminum Cans - CRV	0.9%	0.1%	85,238
Tin/Steel Cans	0.2%	0.0%	20,968
Major Appliances	0.0%	0.0%	2,586
Aluminum Cans - Non-CRV	0.9%	0.1%	84,605
Other Non-Ferrous	0.5%	0.1%	50,852
Plastic	**13.9%**		**1,313,602**
PETE Containers - CRV	0.5%	0.0%	44,502
PETE Containers - Non-CRV	0.3%	0.0%	29,791
PETE Containers, Lids, and other Packaging	0.5%	0.0%	43,182
HDPE Containers - CRV	0.0%	0.0%	4,665
HDPE Containers - Non-CRV	0.6%	0.0%	53,247
HDPE Containers, Lids, and other Packaging	0.1%	0.0%	5,771
Polypropylene Containers and Packaging	1.1%	0.0%	104,620
Other Plastic Containers and Packaging	0.5%	0.0%	44,081
Expanded Polystyrene Packaging	0.8%	0.1%	79,054
Plastic Trash Bags	1.9%	0.1%	175,185
Plastic Grocery and Other Merchandise Bags	0.7%	0.0%	66,961
Non-Bag Commercial and Industrial Packaging Film	0.2%	0.0%	14,576
Film Products	0.4%	0.2%	34,075
Flexible Plastic Pouches	0.1%	0.0%	8,346
Other Film	2.8%	0.1%	263,928
Durable Plastic Items	2.5%	0.3%	232,044
Remainder/Composite Plastic	1.2%	0.2%	109,574
Electronics	**0.6%**		**56,710**
Large Equipment	0.3%	0.1%	32,854
Consumer Electronics and Small Equipment	0.2%	0.0%	20,093
Covered Video Display Devices	0.0%	0.0%	3,762

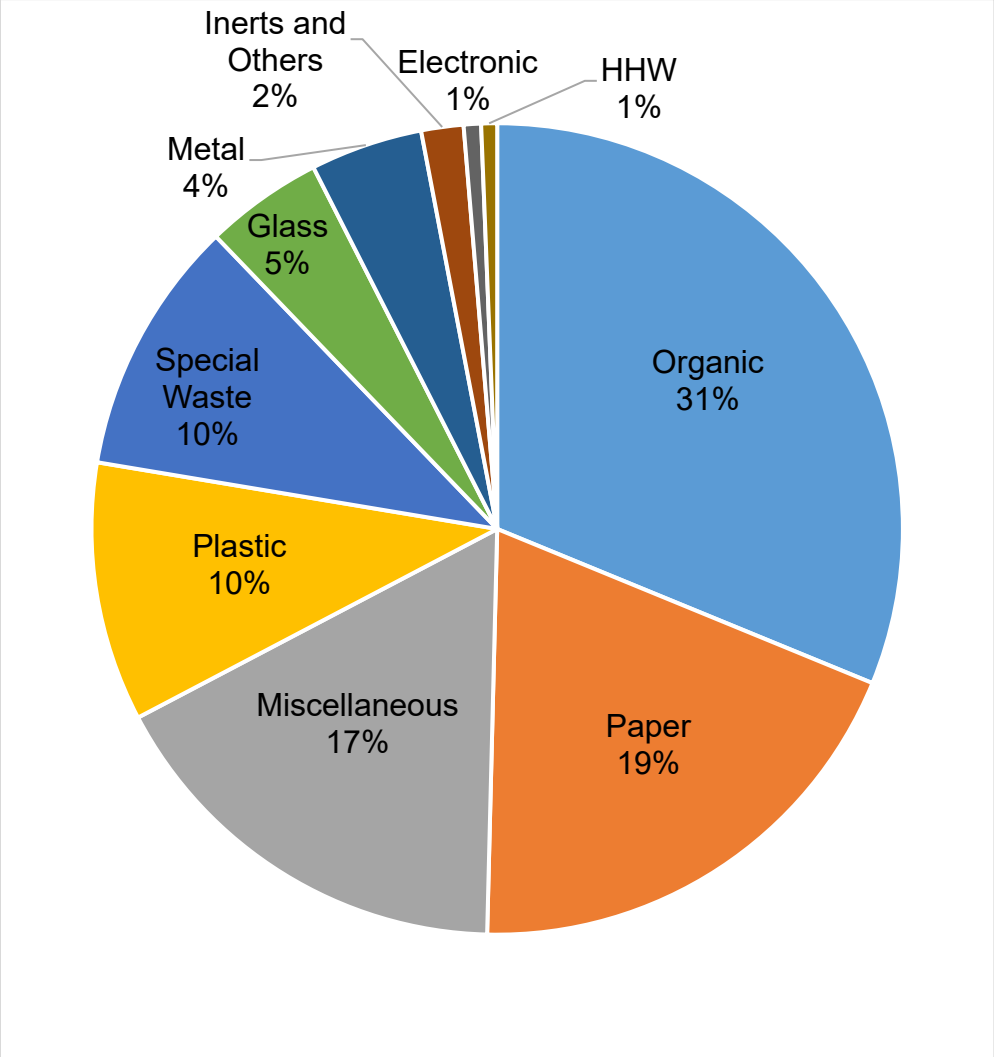
Table 8 (continued). Material Composition of Single-Family Residential Disposed Waste

Material	Estimated Percent	+/-	Estimated Tons
Organic	**32.6%**		**3,076,079**
Food - Potentially Donatable - Vegetative	1.3%	0.1%	126,189
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.2%	0.0%	16,834
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	16,745
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.6%	0.2%	58,895
Food - Potentially Donatable - Packaged Non-perishable	0.6%	0.1%	60,656
Food - Not Donatable - Meat	1.2%	0.1%	114,669
Food - Not Donatable - Non-meat	14.2%	0.6%	1,337,106
Food - Inedible	1.6%	0.1%	148,741
Leaves and Grass	3.2%	0.5%	299,253
Prunings and Trimmings	3.1%	0.4%	291,231
Branches and Stumps	1.2%	0.3%	109,378
Manures	0.9%	0.4%	89,359
Clean Dimensional Lumber	0.8%	0.2%	74,352
Clean Engineered Wood	0.8%	0.2%	77,799
Clean Pallets and Crates	0.0%	0.0%	170
Wood Waste - Treated/Painted/Stained	2.0%	0.3%	192,837
Other Recyclable Wood	0.1%	0.1%	9,672
Remainder/Composite Organic	0.6%	0.1%	52,192
Inerts and Other	**4.3%**		**408,197**
Concrete	0.2%	0.1%	21,751
Asphalt Paving	0.0%	0.0%	0
Asphalt Roofing	0.3%	0.2%	32,956
Gypsum Board	0.2%	0.1%	15,663
Carpet	1.3%	0.3%	119,435
Rock, Soil and Fines	0.9%	0.2%	85,346
Remainder/Composite Inerts and Other	1.4%	0.5%	133,047
Household Hazardous Waste (HHW)	**0.3%**		**30,577**
Paint	0.1%	0.0%	8,862
Used Oil	0.0%	0.0%	658
Lead-acid (Automotive) Batteries	0.0%	0.0%	394
Other Batteries	0.0%	0.0%	3,805
One-Pound Propane Gas Cylinders	0.0%	0.0%	1,377
Pharmaceuticals	0.0%	0.0%	4,328
Remainder/Composite Household Hazardous	0.1%	0.0%	11,154
Special Waste	**1.7%**		**158,354**
Tires	0.0%	0.0%	2,987
Bulky Items	1.1%	0.3%	104,300
Mattresses and Foundations	0.4%	0.3%	42,089
Remainder/Composite Special Waste	0.1%	0.0%	8,978
Miscellaneous	**20.7%**		**1,950,604**
Textiles - Organic	1.9%	0.2%	175,586
Textiles - Synthetic, Mixed, Unknown	3.6%	0.3%	340,794
Textiles - Shoes, Purses, Belts	0.6%	0.1%	56,921
Solar Panels	0.0%	0.0%	1,840
Diapers and Sanitary Products	6.3%	0.4%	591,089
Remainder/Composite Organic - Non-compostable	0.3%	0.1%	23,807
Mixed Residue	6.9%	0.4%	649,942
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	1.2%	0.1%	110,624
Totals	**100.0%**		**9,421,478**
Sample Count	**122**		

Multi-Family Residential Waste

Multi-family residential waste is waste collected by haulers from apartments or condominiums of 5 or more units. Composition results by material class for multi-family residential waste are illustrated in Figure 5 and described in detail in Table 10. As shown in Figure 5, the largest material class was organic, which accounted for about 31 percent of the material in the waste stream, followed by paper, which made up about 19 percent of the multi-family residential waste stream by weight.

Figure 5. Material Classes in Multi-Family Residential Disposed Waste



Ten Most Prevalent Materials

The ten most prevalent material types in the multi-family residential waste stream by weight are presented in Table 9. Combined, these ten material types comprised approximately 55 percent of overall disposed waste.

Table 94. Ten Most Prevalent Material Types in Multi-Family Residential Disposed Waste by Weight

Material	Estimated Percent	Cumulative Percent	Estimated Tons
Food - Not Donatable – Non-meat	16.2%	16.2%	292,941
Bulky Items	7.4%	23.6%	134,333
Mixed Residue	6.4%	30.0%	115,604
Diapers & Sanitary Products	5.7%	35.7%	103,813
Compostable Paper - Non-packaging	5.0%	40.7%	90,446
Uncoated Corrugated Cardboard	3.4%	44.1%	61,877
Food - Potentially Donatable - Vegetative	2.7%	46.9%	49,704
Mattresses and Foundations	2.7%	49.6%	49,201
Other Recyclable Paper	2.5%	52.1%	45,301
Food - Inedible	2.4%	54.5%	42,836
Total	**54.5%**		**986,055**

Detailed Composition

Table 10 presents the detailed composition results for the multi-family residential subsector.

Table 105. Material Composition of Multi-Family Residential Disposed Waste

Material	Estimated Percent	+ / -	Estimated Tons
Paper	**19.2%**		**347,548**
Uncoated Corrugated Cardboard	3.4%	0.4%	61,877
Paper Grocery Bags	0.2%	0.0%	4,367
Other Paper Bags/Kraft Paper	0.4%	0.0%	7,602
Newspapers/Newspaper Inserts	2.3%	0.5%	41,394
White Office-type Paper and Mail	0.2%	0.1%	3,625
Magazines and Catalogs	0.8%	0.2%	14,958
Folding Cartons and Other Paperboard Packaging	2.0%	0.2%	36,945
Other Recyclable Paper	2.5%	0.4%	45,301
Miscellaneous Paper Packaging	0.8%	0.1%	14,392
Aseptic Containers	0.1%	0.0%	1,563
Gable-top Cartons	0.2%	0.0%	3,433
Compostable Paper - Packaging	1.0%	0.2%	17,247
Compostable Paper - Non-packaging	5.0%	0.3%	90,446
Remainder/Composite Paper - Other	0.2%	0.1%	4,399
Glass	**4.7%**		**85,181**
Clear Glass Bottles and Containers - CRV	1.2%	0.3%	22,198
Clear Glass Bottles and Containers - Non-CRV	1.8%	0.2%	33,103
Green Glass Bottles and Containers - CRV	0.1%	0.0%	1,297
Green Glass Bottles and Containers - Non-CRV	0.3%	0.1%	5,748
Brown Glass Bottles and Containers - CRV	0.6%	0.1%	10,989
Brown Glass Bottles and Containers - Non-CRV	0.3%	0.2%	5,111
Other Colored Glass Bottles and Containers	0.1%	0.0%	1,569
Remainder/Composite Glass	0.3%	0.1%	5,166
Metal	**4.5%**		**81,081**
Remainder/Composite Metal	0.9%	0.1%	15,832
Other Ferrous	0.5%	0.4%	8,797
Aluminum Cans - CRV	1.6%	0.9%	28,884
Tin/Steel Cans	0.2%	0.0%	3,272
Major Appliances	0.0%	0.0%	634
Aluminum Cans - Non-CRV	0.5%	0.1%	9,543
Other Non-Ferrous	0.8%	0.5%	14,120
Plastic	**10.3%**		**186,978**
PETE Containers - CRV	0.6%	0.0%	11,260
PETE Containers - Non-CRV	0.5%	0.1%	9,440
PETE Containers, Lids, and other Packaging	0.4%	0.0%	7,375
HDPE Containers - CRV	0.0%	0.0%	541
HDPE Containers - Non-CRV	0.8%	0.1%	15,273
HDPE Containers, Lids, and other Packaging	0.1%	0.0%	1,125
Polypropylene Containers and Packaging	0.9%	0.1%	16,025
Other Plastic Containers and Packaging	0.4%	0.0%	7,245
Expanded Polystyrene Packaging	0.5%	0.0%	9,016
Plastic Trash Bags	1.0%	0.1%	19,000
Plastic Grocery and Other Merchandise Bags	0.7%	0.1%	11,947
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	525
Film Products	0.0%	0.0%	690
Flexible Plastic Pouches	0.1%	0.0%	1,263
Other Film	2.2%	0.1%	40,267
Durable Plastic Items	1.5%	0.2%	27,947
Remainder/Composite Plastic	0.4%	0.0%	8,039
Electronics	**0.7%**		**12,515**
Large Equipment	0.0%	0.0%	257
Consumer Electronics and Small Equipment	0.5%	0.2%	8,945
Covered Video Display Devices	0.2%	0.2%	3,314

Table 10 (continued). Material Composition of Multi-Family Residential Disposed Waste

Material	Estimated Percent	+/-	Estimated Tons
Organic	**31.2%**		**565,046**
Food - Potentially Donatable - Vegetative	2.7%	0.3%	49,704
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.3%	0.1%	5,301
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	3,654
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.6%	0.1%	10,813
Food - Potentially Donatable - Packaged Non-perishable	1.0%	0.2%	17,569
Food - Not Donatable - Meat	2.4%	0.3%	42,836
Food - Not Donatable - Non-meat	16.2%	1.3%	292,941
Food - Inedible	1.2%	0.2%	21,795
Leaves and Grass	2.1%	0.8%	37,782
Prunings and Trimmings	1.9%	0.6%	35,065
Branches and Stumps	0.2%	0.1%	3,123
Manures	0.0%	0.0%	0
Clean Dimensional Lumber	0.0%	0.0%	0
Clean Engineered Wood	0.1%	0.0%	1,081
Clean Pallets and Crates	0.0%	0.0%	0
Wood Waste - Treated/Painted/Stained	1.3%	0.6%	24,320
Other Recyclable Wood	0.0%	0.0%	98
Remainder/Composite Organic	1.0%	0.3%	18,964
Inerts and Other	**1.7%**		**30,490**
Concrete	0.0%	0.0%	0
Asphalt Paving	0.0%	0.0%	0
Asphalt Roofing	0.0%	0.0%	424
Gypsum Board	0.1%	0.1%	2,223
Carpet	0.1%	0.1%	1,194
Rock, Soil and Fines	0.2%	0.1%	3,233
Remainder/Composite Inerts and Other	1.3%	0.7%	23,417
Household Hazardous Waste (HHW)	**0.6%**		**11,447**
Paint	0.0%	0.0%	673
Used Oil	0.0%	0.0%	0
Lead-acid (Automotive) Batteries	0.4%	0.3%	6,491
Other Batteries	0.0%	0.0%	854
One-Pound Propane Gas Cylinders	0.0%	0.0%	132
Pharmaceuticals	0.1%	0.0%	1,400
Remainder/Composite Household Hazardous	0.1%	0.0%	1,897
Special Waste	**10.2%**		**184,367**
Tires	0.0%	0.0%	114
Bulky Items	7.4%	2.5%	134,333
Mattresses and Foundations	2.7%	1.1%	49,201
Remainder/Composite Special Waste	0.0%	0.0%	718
Miscellaneous	**16.9%**		**306,198**
Textiles - Organic	1.0%	0.2%	18,393
Textiles - Synthetic, Mixed, Unknown	1.6%	0.2%	28,213
Textiles - Shoes, Purses, Belts	0.6%	0.2%	10,242
Solar Panels	0.0%	0.0%	0
Diapers and Sanitary Products	5.7%	0.6%	103,813
Remainder/Composite Organic - Non-compostable	0.3%	0.1%	4,713
Mixed Residue	6.4%	0.9%	115,604
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	1.4%	0.2%	25,220
Totals	**100.0%**		**1,810,852**
Sample Count	**40**		

Self-Hauled Waste

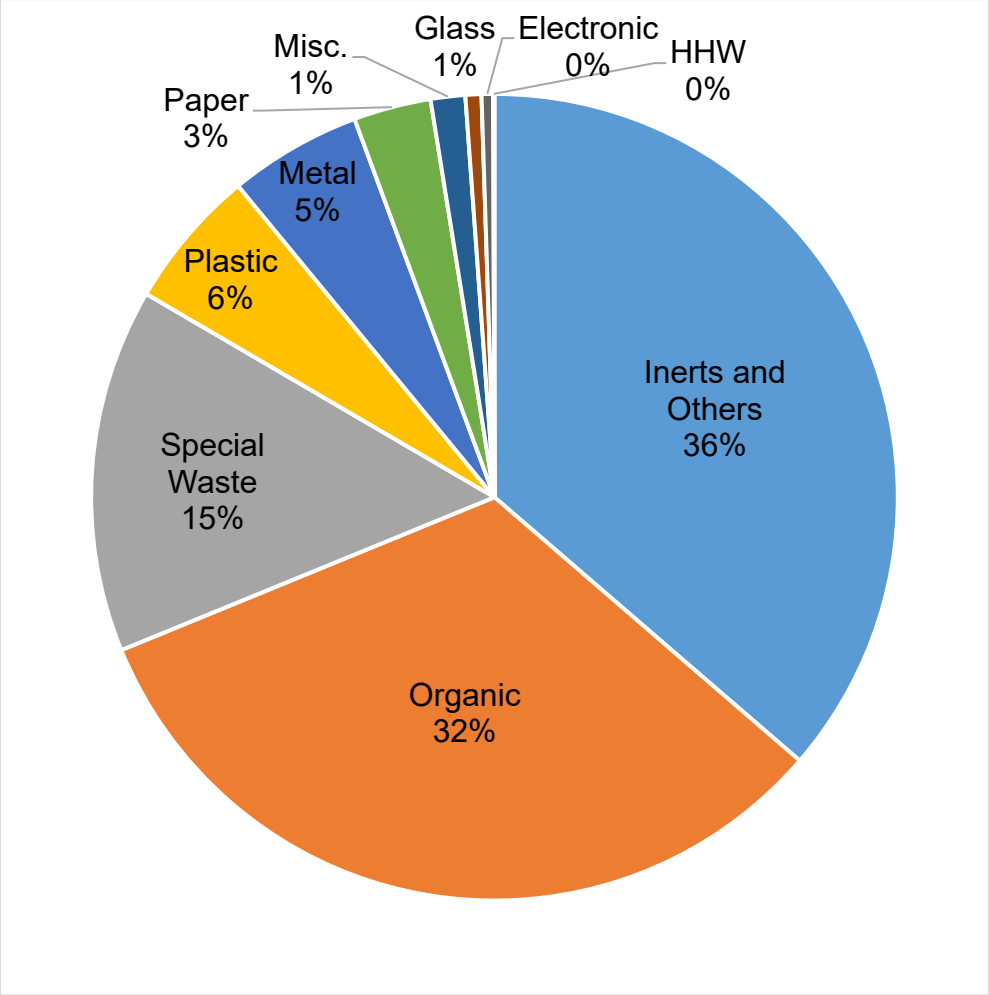
Self-hauled waste is transported to a solid waste disposal site by someone other than a contracted or franchised hauler. This section presents composition findings for the statewide self-hauled sector as a whole.

Overview and Analysis

As shown in Table 1, the self-hauled waste sector accounted for approximately 30 percent of California's municipal solid waste stream.

Composition results by material class for self-hauled waste are illustrated in Figure 6 and described in detail in Table 12. Approximately 36 percent of the self-hauled waste stream was made up of inerts and others.

Figure 6. Material Classes in Overall Self-Hauled Disposed Waste



Ten Most Prevalent Materials

The ten most prevalent material types in the self-haul waste stream by weight are presented in Table 11. These ten material types comprised approximately 70 percent of overall disposed waste.

Table 116. Ten Most Prevalent Material Types in Overall Self-Hauled Disposed Waste

Material	Estimated Percent	Cumulative Percent	Estimated Tons
Bulky Items	13.7%	13.7%	1,595,222
Remainder/Composite Inerts and Others	11.9%	25.6%	1,376,230
Wood - Treated/Painted/Stained	10.2%	35.9%	1,189,006
Rock, Soil and Fines	7.2%	43.0%	832,694
Asphalt Roofing	5.5%	48.5%	634,631
Gypsum Board	5.3%	53.8%	610,830
Wood Waste - Clean Engineered	4.5%	58.2%	517,807
Concrete	4.1%	62.3%	474,633
Prunings and Trimmings	4.0%	66.3%	462,830
Wood Waste - Clean Dimensional Lumber	3.7%	70.0%	426,838
Total	**70.0%**		**8,120,720**

Detailed Composition

Table 12 presents the detailed composition results for the overall self-hauled sector.

Table 127. Material Composition of Overall Self-Hauled Disposed Waste

Material	Estimated Percent	+ / -	Estimated Tons
Paper	**3.1%**		**359,978**
Uncoated Corrugated Cardboard	2.0%	0.4%	227,104
Paper Grocery Bags	0.0%	0.0%	416
Other Paper Bags/Kraft Paper	0.0%	0.0%	5,165
Newspapers/Newspaper Inserts	0.1%	0.0%	6,451
White Office-type Paper and Mail	0.0%	0.0%	3,741
Magazines and Catalogs	0.0%	0.0%	4,902
Folding Cartons and Other Paperboard Packaging	0.0%	0.0%	1,250
Other Recyclable Paper	0.0%	0.0%	1,529
Miscellaneous Paper Packaging	0.5%	0.2%	56,573
Aseptic Containers	0.0%	0.0%	370
Gable-top Cartons	0.0%	0.0%	255
Compostable Paper - Packaging	0.1%	0.0%	6,396
Compostable Paper - Non-packaging	0.0%	0.0%	670
Remainder/Composite Paper - Other	0.4%	0.2%	45,156
Glass	**0.6%**		**74,299**
Clear Glass Bottles and Containers - CRV	0.2%	0.1%	25,086
Clear Glass Bottles and Containers - Non-CRV	0.1%	0.0%	16,697
Green Glass Bottles and Containers - CRV	0.0%	0.0%	309
Green Glass Bottles and Containers - Non-CRV	0.0%	0.0%	107
Brown Glass Bottles and Containers - CRV	0.0%	0.0%	967
Brown Glass Bottles and Containers - Non-CRV	0.0%	0.0%	51
Other Colored Glass Bottles and Containers	0.0%	0.0%	153
Remainder/Composite Glass	0.3%	0.1%	30,930
Metal	**5.3%**		**617,735**
Remainder/Composite Metal	0.9%	0.2%	107,977
Other Ferrous	0.5%	0.1%	56,242
Aluminum Cans - CRV	1.1%	0.2%	132,780
Tin/Steel Cans	0.1%	0.0%	6,747
Major Appliances	0.0%	0.0%	1,211
Aluminum Cans - Non-CRV	1.8%	0.4%	211,883
Other Non-Ferrous	0.9%	0.3%	100,894
Plastic	**5.6%**		**652,762**
PETE Containers - CRV	0.1%	0.1%	9,009
PETE Containers - Non-CRV	0.0%	0.0%	16
PETE Containers, Lids, and other Packaging	0.1%	0.1%	7,287
HDPE Containers - CRV	0.0%	0.0%	516
HDPE Containers - Non-CRV	0.0%	0.0%	2,933
HDPE Containers, Lids, and other Packaging	0.0%	0.0%	0
Polypropylene Containers and Packaging	0.0%	0.0%	572
Other Plastic Containers and Packaging	0.0%	0.0%	5,061
Expanded Polystyrene Packaging	0.1%	0.0%	13,494
Plastic Trash Bags	1.0%	0.2%	118,669
Plastic Grocery and Other Merchandise Bags	0.2%	0.0%	25,970
Non-Bag Commercial and Industrial Packaging Film	0.1%	0.0%	15,254
Film Products	0.6%	0.2%	66,939
Flexible Plastic Pouches	0.0%	0.0%	3,595
Other Film	2.2%	0.4%	256,652
Durable Plastic Items	0.8%	0.1%	88,476
Remainder/Composite Plastic	0.3%	0.1%	38,319
Electronics	**0.5%**		**53,724**
Large Equipment	0.2%	0.1%	28,883
Consumer Electronics and Small Equipment	0.2%	0.1%	20,967
Covered Video Display Devices	0.0%	0.0%	3,874

Table 12 (continued). Material Composition of Overall Self-Hauled Disposed Waste

Material	Estimated Percent	+/-	Estimated Tons
Organic	**32.5%**		**3,769,129**
Food - Potentially Donatable - Vegetative	0.1%	0.0%	14,488
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.0%	0.0%	2,502
Food - Potentially Donatable - Animal Meat	0.0%	0.0%	4,334
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.0%	0.0%	3,356
Food - Potentially Donatable - Packaged Non-perishable	0.0%	0.0%	4,120
Food - Not Donatable - Meat	0.2%	0.0%	17,952
Food - Not Donatable - Non-meat	1.3%	0.2%	150,869
Food - Inedible	0.4%	0.1%	41,274
Leaves and Grass	2.2%	0.4%	251,139
Prunings and Trimmings	4.0%	0.6%	462,830
Branches and Stumps	3.1%	0.5%	359,278
Manures	0.0%	0.0%	0
Clean Dimensional Lumber	3.7%	0.5%	426,838
Clean Engineered Wood	4.5%	0.6%	517,807
Clean Pallets and Crates	1.9%	0.3%	224,092
Wood Waste - Treated/Painted/Stained	10.2%	0.8%	1,189,006
Other Recyclable Wood	0.0%	0.0%	0
Remainder/Composite Organic	0.9%	0.3%	99,242
Inerts and Other	**36.3%**		**4,215,996**
Concrete	4.1%	0.6%	474,633
Asphalt Paving	0.0%	0.0%	5,028
Asphalt Roofing	5.5%	0.8%	634,631
Gypsum Board	5.3%	0.7%	610,830
Carpet	2.4%	0.5%	281,950
Rock, Soil and Fines	7.2%	0.8%	832,694
Remainder/Composite Inerts and Other	11.9%	1.1%	1,376,230
Household Hazardous Waste (HHW)	**0.1%**		**5,854**
Paint	0.0%	0.0%	0
Used Oil	0.0%	0.0%	0
Lead-acid (Automotive) Batteries	0.0%	0.0%	0
Other Batteries	0.0%	0.0%	1,380
One-Pound Propane Gas Cylinders	0.0%	0.0%	0
Pharmaceuticals	0.0%	0.0%	0
Remainder/Composite Household Hazardous	0.0%	0.0%	4,473
Special Waste	**14.6%**		**1,694,419**
Tires	0.3%	0.2%	29,392
Bulky Items	13.7%	1.2%	1,595,222
Mattresses and Foundations	0.6%	0.2%	69,806
Remainder/Composite Special Waste	0.0%	0.0%	0
Miscellaneous	**1.4%**		**160,625**
Textiles - Organic	0.3%	0.1%	35,252
Textiles - Synthetic, Mixed, Unknown	0.3%	0.1%	40,263
Textiles - Shoes, Purses, Belts	0.1%	0.0%	6,084
Solar Panels	0.0%	0.0%	150
Diapers and Sanitary Products	0.0%	0.0%	656
Remainder/Composite Organic - Non-compostable	0.2%	0.1%	21,536
Mixed Residue	0.3%	0.1%	37,702
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	0.2%	0.0%	18,983
Totals	**100.0%**		**11,604,521**
Sample Count	**449**		

Selected Organic Materials

In light of policy changes since the 2014 study, this report highlights statewide disposal estimates for material types related to SB 1383 (Lara, Chapter 395, Statutes of 2016) and AB 1826 (Chesbro, Chapter 727, Statutes of 2014), which both aim to reduce organic materials reaching landfills. At the time of publication, SB 1383 is currently in the formal rulemaking process. Please refer to Table 13 and Table 14, respectively.

Table 13. Composition of California's Overall Disposed Waste Stream – SB1383-related Materials

Material	Estimated Percent	+/-	Estimated Tons
Paper	**16.6%**		**6,525,762**
Uncoated Corrugated Cardboard	5.2%	0.2%	2,037,360
Paper Grocery Bags	0.1%	0.0%	29,248
Other Paper Bags/Kraft Paper	0.4%	0.0%	159,212
Newspapers/Newspaper Inserts	0.7%	0.1%	276,453
White Office-type Paper and Mail	0.4%	0.1%	156,662
Magazines and Catalogs	0.4%	0.0%	161,958
Folding Cartons and Other Paperboard Packaging	1.2%	0.0%	457,564
Other Recyclable Paper	1.4%	0.1%	559,779
Miscellaneous Paper Packaging	0.9%	0.1%	352,975
Aseptic Containers	0.1%	0.0%	28,002
Gable-top Cartons	0.1%	0.0%	46,766
Compostable Paper - Packaging	1.3%	0.1%	515,393
Compostable Paper - Non-packaging	3.9%	0.1%	1,531,324
Remainder/Composite Paper - Other	0.5%	0.1%	213,067
Organic	**34.1%**		**13,397,041**
Food - Potentially Donatable - Vegetative	1.5%	0.2%	577,303
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.2%	0.0%	69,497
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	84,608
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.4%	0.1%	153,255
Food - Potentially Donatable - Packaged Non-perishable	0.6%	0.1%	232,584
Food - Not Donatable - Meat	1.1%	0.1%	436,986
Food - Not Donatable - Non-meat	9.5%	0.3%	3,752,620
Food - Inedible	1.4%	0.1%	552,682
Leaves and Grass	2.3%	0.2%	905,885
Prunings and Trimmings	3.1%	0.3%	1,221,926
Branches and Stumps	1.5%	0.2%	608,127
Manures	0.6%	0.2%	254,093
Clean Dimensional Lumber	2.0%	0.2%	802,353
Clean Engineered Wood	2.2%	0.2%	875,510
Clean Pallets and Crates	2.2%	0.2%	872,840
Wood Waste - Treated/Painted/Stained	4.4%	0.3%	1,740,699
Other Recyclable Wood	0.0%	0.0%	13,824
Remainder/Composite Organic	0.6%	0.1%	242,248
Inerts and Other	**1.6%**		**627,926**
Carpet	1.6%	0.2%	627,926
Miscellaneous	**3.4%**		**1,346,976**
Textiles - Organic	1.1%	0.1%	434,956
Textiles - Synthetic, Mixed, Unknown	1.6%	0.1%	644,473
Textiles - Shoes, Purses, Belts	0.3%	0.0%	120,032
Remainder/Composite Organic - Non-compostable	0.4%	0.1%	147,514
Totals	**55.7%**		**21,897,706**
Sample Count	**892**		

Table 14. Composition of California's Overall Disposed Waste Stream – AB1826-related Materials

Material	Estimated Percent	+/-	Estimated Tons
Organic	**28.4%**		**11,146,176**
Food - Potentially Donatable - Vegetative	1.5%	0.2%	577,303
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.2%	0.0%	69,497
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	84,608
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.4%	0.1%	153,255
Food - Potentially Donatable - Packaged Non-perishable	0.6%	0.1%	232,584
Food - Not Donatable - Meat	1.1%	0.1%	436,986
Food - Not Donatable - Non-meat	9.5%	0.3%	3,752,620
Food - Inedible	1.4%	0.1%	552,682
Leaves and Grass	2.3%	0.2%	905,885
Prunings and Trimmings	3.1%	0.3%	1,221,926
Branches and Stumps	1.5%	0.2%	608,127
Clean Dimensional Lumber	2.0%	0.2%	802,353
Clean Engineered Wood	2.2%	0.2%	875,510
Clean Pallets and Crates	2.2%	0.2%	872,840
Totals	**28.4%**		**11,146,176**
Sample Count	**892**		

MRF Residual Characterization

This section presents the characterization data for the MRF processing residual waste stream for selected MRF types in the Southern California and Bay Area regions. Proportions are provided as a general estimate for each material type per MRF type, and are not representative of all MRFs statewide.

The study included four types of MRFs:

- Mixed Waste Processing
- Clean Recyclables
- Organics Processing
- Construction and Demolition

Detailed Composition

Table 15 presents the detailed composition results for the MRF residual processing waste for each MRF type.

Table 15. Material Composition of MRF Residual Waste

Material	Estimated Percent (Mixed Waste)	Estimated Percent (Clean Recyclables)	Estimated Percent (Organics Processing)	Estimated Percent (C&D)
Paper	**23.8%**	**28.9%**	**7.0%**	**6.0%**
Uncoated Corrugated Cardboard	4.7%	4.6%	2.2%	3.3%
Paper Grocery Bags	0.1%	0.2%	0.0%	0.0%
Other Paper Bags/Kraft Paper	0.7%	0.5%	0.7%	0.0%
Newspapers/Newspaper Inserts	0.3%	0.5%	0.2%	0.0%
White Office-type Paper and Mail	0.3%	0.7%	0.3%	0.1%
Magazines and Catalogs	0.5%	1.5%	0.3%	0.0%
Folding Cartons and Other Paperboard Packaging	1.0%	3.1%	0.6%	0.1%
Other Recyclable Paper	2.4%	6.6%	1.1%	0.9%
Miscellaneous Paper Packaging	0.9%	0.9%	0.3%	0.1%
Aseptic Containers	0.1%	0.2%	0.0%	0.0%
Gable-top Cartons	0.2%	0.5%	0.1%	0.0%
Compostable Paper - Packaging	2.2%	2.1%	0.2%	0.3%
Compostable Paper - Non-packaging	9.6%	5.7%	0.7%	0.7%
Remainder/Composite Paper - Other	0.8%	1.8%	0.3%	0.5%
Glass	**0.5%**	**1.9%**	**0.0%**	**0.2%**
Clear Glass Bottles and Containers - CRV	0.1%	0.5%	0.0%	0.0%
Clear Glass Bottles and Containers - Non-CRV	0.2%	0.3%	0.0%	0.0%
Green Glass Bottles and Containers - CRV	0.0%	0.2%	0.0%	0.0%
Green Glass Bottles and Containers - Non-CRV	0.1%	0.4%	0.0%	0.0%
Brown Glass Bottles and Containers - CRV	0.0%	0.2%	0.0%	0.0%
Brown Glass Bottles and Containers - Non-CRV	0.0%	0.1%	0.0%	0.0%
Other Colored Glass Bottles and Containers	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	0.0%	0.2%	0.0%	0.2%
Metal	**2.3%**	**4.7%**	**1.6%**	**3.8%**
Tin/Steel Cans	0.2%	1.8%	0.4%	0.1%
Major Appliances	0.1%	0.1%	0.0%	0.1%
Other Ferrous	0.6%	1.0%	0.4%	2.5%
Aluminum Cans - CRV	0.1%	0.5%	0.2%	0.1%
Aluminum Cans - Non-CRV	0.0%	0.1%	0.0%	0.0%
Other Non-Ferrous	0.9%	0.6%	0.4%	0.8%
Remainder/Composite Metal	0.4%	0.6%	0.2%	0.3%
Plastic	**20.2%**	**33.3%**	**9.9%**	**13.2%**
PETE Containers - CRV	0.4%	0.7%	0.6%	0.1%
PETE Containers - Non-CRV	0.2%	1.1%	0.1%	0.0%
PETE Containers, Lids, and other Packaging	0.8%	1.9%	0.1%	0.0%
HDPE Containers - CRV	0.0%	0.0%	0.0%	0.0%
HDPE Containers - Non-CRV	0.4%	1.6%	0.4%	0.1%
HDPE Containers, Lids, and other Packaging	0.0%	0.4%	0.0%	0.0%
Polypropylene Containers and Packaging	1.1%	2.4%	0.5%	0.1%
Other Plastic Containers and Packaging	0.8%	2.9%	0.3%	0.1%
Expanded Polystyrene Packaging	0.4%	1.0%	0.2%	0.1%
Plastic Trash Bags	1.7%	1.3%	0.5%	0.2%
Plastic Grocery and Other Merchandise Bags	0.5%	0.6%	0.2%	0.0%
Non-Bag Commercial and Industrial Packaging Film	0.4%	0.8%	0.4%	2.5%
Film Products	0.1%	0.2%	0.1%	0.1%
Flexible Plastic Pouches	0.0%	0.1%	0.0%	0.0%
Other Film	9.7%	9.2%	3.4%	1.6%
Durable Plastic Items	2.0%	6.9%	2.5%	3.8%
Remainder/Composite Plastic	1.6%	2.2%	0.6%	4.2%
Electronics	**0.4%**	**1.3%**	**0.2%**	**0.4%**
Large Equipment	0.1%	0.2%	0.0%	0.0%
Consumer Electronics and Small Equipment	0.3%	1.1%	0.2%	0.1%
Covered Video Display Devices	0.0%	0.0%	0.0%	0.3%

Percentages for material types may not total 100% due to rounding.

Table 15 (continued). Material Composition of MRF Residual Waste

Material	Estimated Percent (Mixed Waste)	Estimated Percent (Clean Recyclables)	Estimated Percent (Organics Processing)	Estimated Percent (C&D)
Organic	**14.3%**	**4.9%**	**51.1%**	**26.7%**
Food - Potentially Donatable - Vegetative	0.4%	0.1%	0.0%	0.0%
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.1%	0.0%	0.0%	0.0%
Food - Potentially Donatable - Animal Meat	0.1%	0.0%	0.0%	0.0%
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.1%	0.0%	0.1%	0.0%
Food - Potentially Donatable - Packaged Non-perishable	0.2%	0.1%	0.0%	0.0%
Food - Not Donatable - Meat	0.3%	0.1%	0.1%	0.1%
Food - Not Donatable - Non-meat	3.3%	1.0%	0.4%	0.6%
Food - Inedible	0.5%	0.1%	0.0%	0.0%
Leaves and Grass	0.3%	0.0%	2.4%	0.1%
Prunings and Trimmings	1.1%	0.0%	26.8%	0.8%
Branches and Stumps	0.4%	0.1%	13.3%	0.2%
Manures	0.0%	0.0%	0.0%	0.0%
Clean Dimensional Lumber	0.7%	0.4%	1.0%	6.9%
Clean Engineered Wood	1.9%	0.3%	1.5%	8.7%
Clean Pallets and Crates	1.1%	0.2%	0.2%	1.4%
Wood Waste - Treated/Painted/Stained	2.5%	2.4%	4.4%	6.6%
Other Recyclable Wood	0.8%	0.0%	0.5%	1.3%
Remainder/Composite Organic	0.4%	0.1%	0.5%	0.0%
Inerts and Other	**7.0%**	**3.0%**	**11.9%**	**22.5%**
Concrete	0.8%	0.4%	7.4%	7.1%
Asphalt Paving	0.0%	0.0%	0.1%	0.0%
Asphalt Roofing	0.7%	0.0%	0.1%	2.7%
Gypsum Board	0.2%	0.0%	0.1%	5.3%
Carpet	1.3%	0.1%	0.5%	1.0%
Rock, Soil and Fines	0.4%	0.1%	1.4%	0.8%
Remainder/Composite Inerts and Other	3.5%	2.4%	2.4%	5.5%
Household Hazardous Waste (HHW)	**0.3%**	**0.3%**	**0.0%**	**0.2%**
Paint	0.0%	0.1%	0.0%	0.1%
Used Oil	0.0%	0.0%	0.0%	0.0%
Lead-acid (Automotive) Batteries	0.0%	0.0%	0.0%	0.0%
Other Batteries	0.0%	0.1%	0.0%	0.0%
One-Pound Propane Gas Cylinders	0.0%	0.0%	0.0%	0.0%
Pharmaceuticals	0.1%	0.0%	0.0%	0.0%
Remainder/Composite Household Hazardous	0.2%	0.1%	0.0%	0.1%
Special Waste	**2.7%**	**1.7%**	**1.3%**	**16.5%**
Tires	0.1%	0.1%	0.1%	0.0%
Bulky Items	2.5%	1.6%	1.2%	16.4%
Mattresses and Foundations	0.1%	0.0%	0.0%	0.1%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Miscellaneous	**28.5%**	**20.1%**	**17.0%**	**10.5%**
Textiles - Organic	1.1%	0.7%	0.8%	0.2%
Textiles - Synthetic, Mixed, Unknown	4.8%	2.1%	3.0%	0.8%
Textiles - Shoes, Purses, Belts	0.9%	0.7%	0.4%	0.1%
Solar Panels	0.0%	0.0%	0.0%	0.0%
Diapers and Sanitary Products	3.4%	0.5%	0.5%	0.1%
Remainder/Composite Organic - Non-compostable	0.7%	0.3%	0.6%	0.1%
Mixed Residue	0.3%	0.0%	0.0%	0.1%
MRF Residual Fines	16.8%	15.3%	11.6%	9.0%
Miscellaneous Inorganics	0.4%	0.5%	0.0%	0.0%
Totals	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Sample Count	**76**	**38**	**38**	**49**

Percentages for material types may not total 100% due to rounding.

Appendix A: Detailed Methodology

Overview

This document describes the major elements of the methodology for the facility-based study to characterize waste sent for disposal statewide, including the selection of locations for sampling and surveying, the waste sampling and vehicle surveying procedures, and the data analysis approach.

Definitions of Regions, Waste Sectors, and Subsectors

Descriptions and definitions of the waste sectors and regions used to stratify data collection for the 2018 study are presented in the following sections.

Regions

This study divided California into five regions to account for regional variations in waste composition due to factors including geography, population, socio-economic variation, and major types of industry. The regions are shown graphically in Figure 7, and the counties within each region are cited in Table 16.

Figure 7. Five Regions Considered in the Study: Bay Area, Central Valley, Coastal, Mountain and Southern

*see Table 16 for complete list of counties.

The five regions shown in Figure 7 are defined as follows:

- **Bay Area** – includes the counties in the San Francisco Bay Area, which are more metropolitan counties with a strong industrial component.
- **Central Valley** – includes the counties between the Sierra Nevada Mountains and the Coast Range that have a major agricultural sector with some urban areas and some manufacturing.
- **Coastal** – includes the counties on or near the coast that were not in either the Bay Area or Southern Region. The Coastal Region is more populated than the rural Mountain Region and has a large agricultural sector similar to the Central Valley.
- **Mountain** – includes the counties that are primarily rural, with strong agricultural economies, low population density, and a small industrial sector.
- **Southern** – includes the counties that are strongly industrial with large populations and some agriculture.

Table 16. Counties in the Five Sampling Regions

Bay Area	Central Valley	Coastal	Mountain	Southern
Alameda	Butte	Del Norte	Alpine	Imperial
Contra Costa	Colusa	Humboldt	Amador	Los Angeles
Marin	Fresno	Lake	Calaveras	Orange
Napa	Glenn	Mendocino	El Dorado	Riverside
San Francisco	Kern	Monterey	Inyo	San Bernardino
San Mateo	Kings	San Benito	Lassen	San Diego
Santa Clara	Madera	San Luis	Mariposa	Ventura
Solano	Merced	Obispo	Modoc	
Sonoma	Placer	Santa Barbara	Mono	
	Sacramento	Santa Cruz	Nevada	
	San Joaquin		Plumas	
	Shasta		Sierra	
	Stanislaus		Siskiyou	
	Sutter		Trinity	
	Tehama		Tuolumne	
	Tulare			
	Yolo			
	Yuba			

For more background on how the regions were defined, see Appendix A of the 1999 Statewide Waste Characterization Study. Some of the regions in this study were modified slightly from the 1999 study, but match the regions used in the past two studies.

Waste Sectors and Subsectors

The study characterized waste from the four sectors and six subsectors listed in Figure 8.

Figure 8. Overview of Waste Disposal Sectors, Subsectors and Corresponding Waste Characteristics

Sector/Subsector	Description
Franchised Commercial Waste	Waste in this sector must meet all criteria to be included: It is destined for landfill disposal. It is generated by businesses, industries (e.g., factories, farms), institutions, and public areas (e.g., roads, parks). It is not significantly mixed with waste from other sectors It is collected and transported by contracted or franchised waste haulers, both private and public (municipal). It is not construction and demolition debris. This sector includes route trucks and packer trucks that collect from dumpsters; closed drop boxes and compactors; open-top drop boxes; and residuals from the processing of loads that meet these criteria.
Franchised Residential Waste	Waste in this sector must meet all criteria to be included: It is destined for landfill disposal. It is generated by households. It is collected and transported by contracted or franchised waste haulers, both private and public (municipal). It is collected on regular residential collection routes. It is not construction and demolition debris.
Single-family Residential Waste	This subsector includes waste that meets the sector criteria and is collected in packer trucks from either single-family residences or buildings that include no more than four living units. This subsector also includes residuals from the processing of loads that meet these criteria.

Sector/Subsector	Description
Multi-family Residential Waste	This subsector includes waste that meet the sector criteria and is collected from multi-unit buildings with five or more living units. This includes route trucks and packer trucks that collect from dumpsters; closed drop boxes and compactors; and open-top drop boxes. This subsector also includes residuals from the processing of loads that meet these criteria.
Self-Haul/Other Waste	Waste in this sector must meet all criteria to be included: It does not meet the Franchised Commercial or Franchised Residential sector definitions. It is unprocessed or lightly processed. Lightly processed means some high value and/or bulky materials may be manually separated on the tip floor. Loads that are mechanically separated on a processing line are not included in this sector. This sector includes waste hauled by individuals, businesses, or government agencies that haul their own garbage. This also includes all construction related waste, regardless of the hauler and all non-packer truck, single-family franchise hauled waste.
Materials Recovery Facility (MRF) Processing Residuals	Waste destined for landfill disposal from MRFs after processing materials to remove the recoverable fraction.
Source Separated Recyclables Processing Residuals	Materials destined for landfill disposal after a facility has processed loads of source-separated recyclable materials. This includes residuals from typical curbside single-stream and dual-stream collection programs as well as processed from buy-back centers or other recycling drop-off locations.
Construction & Demolition (C&D) Debris Processing Residuals	Materials destined for landfill disposal after a facility has processed loads of construction and demolition debris.

Sector/Subsector	Description
Organic Waste Processing Residuals	Materials destined for landfill disposal after a facility has processed loads of organics waste. This includes loads of “wet waste” from jurisdictions with a “wet/dry” collection system.
Mixed Waste Processing Residuals	Materials destined for landfill disposal after a facility has processed loads of mixed municipal solid waste. This includes loads of “dry waste” from jurisdictions with a “wet/dry” collection system.

Throughout this document the franchised commercial, franchised residential, and self-haul sectors will be collectively referred to as “primarily unprocessed waste.” Additionally, all franchised residential subsectors are included when referring to primarily unprocessed waste sectors. The MRF processing residuals sector and subsectors will be referred to as “residuals.”

Selection, Recruitment, and Logistics for Sampling Sites

CalRecycle staff was responsible for all sampling site selection, recruitment, and the compilation of initial site data. After staff recruited and confirmed participation of the sampling sites, CalRecycle transferred all facility contacts and information gathered from site interviews to the Cascadia project team. The project team then coordinated final logistics and scheduling with each site. The procedures for conducting site recruitment for the 34 primarily unprocessed waste facilities, 40 multi-family sites, and 9 MRFs are outlined below.

Primarily Unprocessed Waste Sites

Selecting Primarily Unprocessed Waste Sites

CalRecycle's goal was to recruit facilities receiving the largest portion of direct-hauled waste from desired counties in the state. These facilities included landfills and transfer stations that accepted unprocessed inbound direct-hauled waste from at least one sector. The first phase in the site selection process was identifying what counties to sample from; CalRecycle determined the counties using the following steps:

1. Estimate the annual disposed tonnage from each region in the state.

The disposed tons from each region were based on DRS data, and are summarized in Table 17.

Table 17. 2017 Regional Disposal Summary from CalRecycle's DRS

Region	2017 Disposed Tons	Proportion of Disposed Tons
Southern	21,566,992	60%
Bay Area	5,741,043	16%
Central Valley	6,372,084	18%
Coastal	1,721,197	5%
Mountain	596,407	2%
Total	**35,997,722**	**100%**

2. Allocate sampling days to regions

The number of sampling days was allocated to each region based on the proportion of the region's disposal tonnage. The number of days allocated to each region are shown in Table 18.

Table 18. Number of Sampling Days Allocated to Each Region

Region	Proportion of Disposed Tons	Days Allocated	Proportion of Allocated Days
Southern	60%	22	55%
Bay Area	16%	7	18%
Central Valley	18%	7	18%
Coastal	5%	2	5%
Mountain	2%	2	5%
Total	**100%**	**40**	**100%**

3. Rank each county by tons disposed

Using 2017 DRS data, staff ranked the counties in each region by total tonnage disposed. The county rankings (by disposed tons) are summarized in Table 19.

Table 19. Counties Ranked by Total Tons Disposed in 2017

Rank Within State	Rank Within Region	County	Region	Disposed Tons	Statewide Contribution %
1	1	Los Angeles	Southern	10,098,794	28.1%
2	2	San Diego	Southern	3,320,123	9.2%
3	3	Orange	Southern	3,131,452	8.7%
4	4	Riverside	Southern	2,163,367	6.0%
5	5	San Bernardino	Southern	1,737,386	4.8%
6	1	Santa Clara	Bay Area	1,369,877	3.8%
7	1	Sacramento	Central Valley	1,285,723	3.6%
8	2	Alameda	Bay Area	1,192,729	3.3%
9	2	Kern	Central Valley	940,804	2.6%
10	6	Ventura	Southern	866,848	2.4%
11	3	Fresno	Central Valley	836,344	2.3%
12	3	Contra Costa	Bay Area	769,641	2.1%
13	4	San Joaquin	Central Valley	750,332	2.1%
14	4	San Francisco	Bay Area	600,451	1.7%
15	5	San Mateo	Bay Area	597,213	1.7%
16	5	Stanislaus	Central Valley	590,551	1.6%
17	6	Solano	Bay Area	430,713	1.2%
18	7	Sonoma	Bay Area	427,379	1.2%
19	1	Santa Barbara	Coastal	415,706	1.2%
20	2	Monterey	Coastal	406,048	1.1%
21	6	Tulare	Central Valley	375,336	1.0%
22	7	Placer	Central Valley	301,450	0.8%

Rank Within State	Rank Within Region	County	Region	Disposed Tons	Statewide Contribution %
23	3	San Luis Obispo	Coastal	299,714	0.8%
24	8	Merced	Central Valley	249,870	0.7%
25	7	Imperial	Southern	249,022	0.7%
26	8	Marin	Bay Area	223,481	0.6%
27	4	Santa Cruz	Coastal	210,995	0.6%
28	9	Butte	Central Valley	198,662	0.6%
29	10	Yolo	Central Valley	183,351	0.5%
30	11	Shasta	Central Valley	177,804	0.5%
31	1	El Dorado	Mountain	151,366	0.4%
32	2	Calaveras	Mountain	142,756	0.4%
33	12	Madera	Central Valley	139,074	0.4%
34	13	Yuba-Sutter	Central Valley	135,730	0.4%
35	5	Lake	Coastal	133,316	0.4%
36	9	Napa	Bay Area	129,559	0.4%
37	6	Humboldt	Coastal	100,329	0.3%
38	14	Kings	Central Valley	100,304	0.3%
39	7	San Benito	Coastal	74,482	0.2%
40	3	Nevada	Mountain	71,766	0.2%
41	8	Mendocino	Coastal	62,373	0.2%
42	15	Tehama	Central Valley	61,476	0.2%
43	4	Tuolumne	Mountain	42,226	0.1%
44	5	Siskiyou	Mountain	37,426	0.1%
45	6	Amador	Mountain	32,171	0.1%
46	16	Colusa	Central Valley	23,516	0.1%
47	7	Mono	Mountain	23,409	0.1%
48	17	Glenn	Central Valley	21,758	0.1%
49	8	Inyo	Mountain	20,592	0.1%
50	9	Plumas	Mountain	20,576	0.1%

Rank Within State	Rank Within Region	County	Region	Disposed Tons	Statewide Contribution %
51	10	Lassen	Mountain	19,876	0.1%
52	9	Del Norte	Coastal	18,234	0.1%
53	11	Mariposa	Mountain	15,127	0.0%
54	12	Trinity	Mountain	9,752	0.0%
55	13	Modoc	Mountain	5,303	0.0%
56	14	Sierra	Mountain	2,884	0.0%
57	15	Alpine	Mountain	1,177	0.0%
			Total	**35,997,724**	**100%**

4. Select desired counties

The desired counties are listed in Table 20. An estimated 84% of the state's waste was disposed by residents and businesses in the desired counties.

Table 20. Counties Desired for Sampling in Each Region

Rank Within State	Rank Within Region	County	Region	# of Days	# of Facilities
1	1	Los Angeles	Southern	4	3
2	2	San Diego	Southern	4	3
3	3	Orange	Southern	4	3
4	4	Riverside	Southern	4	3
5	5	San Bernardino	Southern	4	3
6	1	Santa Clara	Bay Area	2	2
7	1	Sacramento	Central Valley	2	2
8	2	Alameda	Bay Area	2	2
9	2	Kern	Central Valley	2	2
10	6	Ventura	Southern	2	2
11	3	Fresno	Central Valley	2	2
12	3	Contra Costa	Bay Area	2	2
13	4	San Joaquin	Central Valley	1	1
14	4	San Francisco	Bay Area	1	1
19	1	Santa Barbara	Coastal	1	1
20	2	Monterey	Coastal	1	1

Rank Within State	Rank Within Region	County	Region	# of Days	# of Facilities
31	1	El Dorado	Mountain	1	1
40	3	Nevada*	Mountain	1	1
			Totals	**40**	**35**

*In 2017, Calaveras County disposed of more waste than Nevada County due to a large amount of fire debris. In a typical year, Nevada County disposes of considerably more waste than Calaveras County so the selection for this study considers Nevada county to be the second largest in the Mountain Region.

Once the desired counties were selected, the facilities that received waste from those counties were identified and selected. Facilities did not have to be located in the desired county to be considered. Facilities were selected using the steps described below in Table 21.

One day of sampling was planned for each facility; however, a second consecutive day of sampling occurred at the facilities that received the greatest quantity of direct haul waste from the five counties with the highest disposal in the state. Overall, 35 facilities were suitable for recruitment for 40 sampling days.

Table 21. Selecting Sampling Sites

Desired Facilities	# days at each facility	# total facilities	# days total
Facilities receiving the most direct haul from the two counties with the highest disposal in the mountain region (El Dorado and Nevada)	1	2	2
Facilities receiving the most direct haul from the two counties with the highest disposal in the coastal region (Santa Barbara and Monterey)	1	2	2
Facilities receiving the most direct haul from the five counties with the highest disposal in the state (Los Angeles, San Diego, Orange, Riverside, and San Bernardino)	2	5	10
Facilities receiving the second most direct haul from the five counties with the highest disposal in the state (Los Angeles, San Diego, Orange, Riverside and San Bernardino)	1	5	5
Facilities receiving the third most direct haul from the five counties with the highest disposal in the state (Los Angeles, San Diego, Orange, Riverside and San Bernardino)	1	5	5
Facilities receiving the most direct haul from the five counties with the sixth to tenth highest disposal rate in the state (Santa Clara, Sacramento, Alameda, Kern, and Ventura)	1	5	5
Facilities receiving the second most direct haul from five counties with the sixth to tenth highest disposal rate in the state (Santa Clara, Sacramento, Alameda, Kern and Ventura)	1	5	5
Facilities receiving the most direct haul from the counties with the eleventh to thirteenth highest disposal rate in the state (Fresno, Contra Costa and San Joaquin)	1	3	3
Facilities receiving the second most direct haul from the counties with the eleventh to thirteenth highest disposal rate in the state (Fresno, Contra Costa and San Joaquin)	1	3	3
Total	**10**	**35**	**40**

Recruiting Primarily Unprocessed Waste Sites

After determining the facilities desired for sampling, CalRecycle staff contacted each facility to ask for their participation in the study. If the facility agreed to participate, staff conducted an interview to determine eligibility (see questionnaire in Appendix C: Forms Used in the Study).

A facility needed to meet the following minimum criteria:

- The site handled waste destined for final disposal. For a landfill, this means waste that is buried; for a transfer station, this means waste that will be aggregated with other material and sent to landfill. This does not include waste subjected to extensive mechanical separation or diversion techniques, like processing residuals;
- It was possible to obtain estimated tonnage data from all three waste sectors (franchised commercial, franchised residential, and self-haul) at the site; and
- It was possible to survey, sample, and sort at the site.

If a facility met the minimum criteria, the following additional information was obtained through the interview:

- Written directions to the facility
- The facility's days and hours of operation
- Contact information for: facility owner, an employee with the authority to permit use of the facility, an employee who can provide site data, and an employee for day-of coordination assistance and logistics
- An agreed upon plan and location for performing the surveying, sampling, and sorting at the facility
- Availability of a loader and operator to assist with moving samples
- A plan for the use of facility scales and the cooperation of gatehouse personnel to obtain vehicle net weights
- The number of scales at the facility and the process by which vehicles are directed to the scales (e.g., whether commercial haulers use a scale separate from self-haul or cash customers)
- Approximate daily and weekly load counts and tonnage by waste sector, subsector, and total for the facility
- Estimated vehicle traffic expected for each sector on weekdays and weekends, and daily traffic patterns for each sector;
- Any facility-specific standards used for recording the net weight of vehicles and for recording alternate minimum weights for small vehicles
- Information about existing recycling or recovery operations at the facility, and how the study team may obtain samples of waste after any recycling or recovery operations have already been applied to the waste
- Tips about any unusual conditions (e.g., weather, anomalies in traffic patterns) that might affect data collection

If the selected facility was unwilling or unable to accommodate the study conditions, the facility that received the next greatest amount of direct haul waste in the same county was recruited.

In cases when the selected facility was a transfer station/MRF, sampling occurred at the transfer station portion. In order to ensure separate samples for franchised residential and commercial wastes, a MRF/transfer station was only retained as a sampling site if they accepted separate loads from each sector that could be sampled. If the MRF/transfer station was unable to accept sector-specific waste samples then they were replaced by the facility receiving the next greatest amount of direct haul waste from the same county.

The final list of participating facilities is shown in Table 22.

Table 22. Final List of Participating Waste Facilities

Region	County	Facility	City	# of Days
Bay Area	Alameda	Davis St. Transfer and Recovery Complex	San Leandro	2
Bay Area	San Francisco	Recology Transfer and Recycling Center	San Francisco	1
Bay Area	Santa Clara	Guadalupe Sanitary Landfill	San Jose	1
Bay Area	Contra Costa	Contra Costa Transfer Station	Martinez	1
Bay Area	Contra Costa	Mount Diablo Transfer Station	Pittsburg	1
Bay Area	Santa Clara	GreenWaste Transfer and Recycling Center	San Jose	1
Coastal	Monterey	Monterey Peninsula Landfill	Monterey	1
Coastal	Santa Barbara	Santa Maria Landfill	Santa Maria	1
Mountain	El Dorado	Western El Dorado Recovery Systems MRF	Placerville	1
Mountain	Nevada	McCourtney Road Transfer Station	Grass Valley	1
Southern	Los Angeles	Puente Hills Material Recovery	Whittier	2
Southern	Los Angeles	Chiquita Canyon Landfill	Castaic	1
Southern	Los Angeles	Calabasas Landfill	Calabasas	1
Southern	Los Angeles	Athens Services Sun Valley Waste	Sun Valley	1
Southern	San Diego	Sycamore Landfill	Santee	1
Southern	San Diego	West Miramar Sanitary Landfill	San Diego	0*
Southern	San Diego	Otay Landfill	Chula Vista	3
Southern	Orange	CVT Regional Transfer Station	Anaheim	2
Southern	Orange	Olinda Alpha Landfill	Brea	1
Southern	Orange	Frank R. Bowerman Landfill	Irvine	1
Southern	Riverside	Robert Nelson Transfer Station	Riverside	2
Southern	Riverside	El Sobrante Landfill	Corona	1

Region	County	Facility	City	# of Days
Southern	Riverside	Moreno Valley Transfer Station	Moreno Valley	1
Southern	San Bernardino	West Valley MRF	Fontana	2
Southern	San Bernardino	Victorville Sanitary Landfill	Victorville	1
Southern	San Bernardino	Inland Regional Transfer Station	Colton	1
Southern	Ventura	Del Norte Regional Recycling and Transfer	Oxnard	1
Valley	Sacramento	Elder Creek Transfer Station	Sacramento	1
Valley	Sacramento	North Area Transfer Station	North Highlands	1
Valley	Kern	Bakersfield Metropolitan SLF (BENA)	Arvin	1
Valley	Kern	Shafter-Wasco Landfill	Shafter	1
Valley	Fresno	American Avenue Disposal Site	Kerman	1
Valley	Fresno	Cedar Avenue Recycling and Transfer	Manteca	1
Valley	San Joaquin	Lovelace Transfer Station	Stockton	1

*Vehicle surveys were done at West Miramar but staff were unable to coordinate with the facility for waste sampling.

Primarily Unprocessed Waste Site Scheduling and Logistics

After recruiting the facilities, Cascadia staff conducted site visits and vehicle surveys to collect information necessary for planning the waste sampling. The preparatory work conducted by the survey team helped improve the sampling and sorting efficiency at each site, and provided valuable estimates of the number of samples that needed to be collected during sorting. For all but three facilities, surveying and site visits were completed before waste sorting.

Thirty-five days were spent surveying 33 facilities (about one day per facility) from August to October 2018. Two facilities were surveyed in April 2019, due to logistical considerations. Waste sampling occurred from September to November 2018. One facility was sampled in April 2019 due to logistical considerations. One facility was recruited but left the study due to safety concerns and could not be replaced.

The survey and sampling dates for each facility are shown in Table 23.

Table 23. Facility Survey and Sampling Dates

Region	County	Facility	City	Survey Date	Sampling Date
Bay Area	Alameda	Davis St. Transfer and Recovery Complex	San Leandro	8/14/18	9/11-9/12/18
Bay Area	San Francisco	Recology Transfer and Recycling Center	San Francisco	8/17/18	9/13/18
Bay Area	Santa Clara	Guadalupe Sanitary Landfill	San Jose	9/10/18	9/14/18
Bay Area	Contra Costa	Contra Costa Transfer Station	Martinez	8/13/18	9/18/18
Bay Area	Contra Costa	Mount Diablo Transfer Station	Pittsburg	9/11/18	9/19/18
Bay Area	Santa Clara	GreenWaste Transfer and Recycling Center	San Jose	*	4/10/19
Coastal	Monterey	Monterey Peninsula Landfill	Monterey	9/13/18	9/24/18
Coastal	Santa Barbara	Santa Maria Landfill	Santa Maria	9/14/18	11/9/18
Mountain	El Dorado	Western El Dorado Recovery Systems MRF	Placerville	8/16/18	9/28/18
Mountain	Nevada	McCourtney Road Transfer Station	Grass Valley	4/11/19	9/27/18
Southern	Los Angeles	Puente Hills Material Recovery	Whittier	8/24/18	11/1-11/2/18
Southern	Los Angeles	Chiquita Canyon Landfill	Castaic	9/18/18	11/6/18
Southern	Los Angeles	Calabasas Landfill	Calabasas	10/22/18	11/7/18
Southern	Los Angeles	Athens Services Sun Valley Waste	Sun Valley	10/23/18	11/5/18
Southern	San Diego	Sycamore Landfill	Santee	8/27/18	10/22/18
Southern	San Diego	West Miramar Sanitary Landfill	San Diego	8/28/18	**
Southern	San Diego	Otay Landfill	Chula Vista	8/29/18	10/23-10/25/18
Southern	Orange	CVT Regional Transfer Station	Anaheim	10/24/18	10/26 & 10/29/18
Southern	Orange	Olinda Alpha Landfill	Brea	10/26/18	10/31/18
Southern	Orange	Frank R. Bowerman Landfill	Irvine	10/25/18	10/30/18
Southern	Riverside	Robert Nelson Transfer Station	Riverside	8/30/18	10/11-10/12/18
Southern	Riverside	El Sobrante Landfill	Corona	8/31/18	10/10/18

Region	County	Facility	City	Survey Date	Sampling Date
Southern	Riverside	Moreno Valley Transfer Station	Moreno Valley	9/20/18	10/5/18
Southern	San Bernardino	West Valley MRF	Fontana	9/21/18	10/8-10/9/18
Southern	San Bernardino	Victorville Sanitary Landfill	Victorville	4/17/19	10/3/18
Southern	San Bernardino	Inland Regional Transfer Station	Colton	9/19/18	10/4/18
Southern	Ventura	Del Norte Regional Recycling and Transfer	Oxnard	9/17/18	11/8/18
Valley	Sacramento	Elder Creek Transfer Station	Sacramento	8/16/18	9/20/18
Valley	Sacramento	North Area Transfer Station	North Highlands	8/15/18	9/21/18
Valley	Kern	Bakersfield Metropolitan SLF (BENA)	Arvin	8/22/18	10/2/18
Valley	Kern	Shafter-Wasco Landfill	Shafter	8/23/18	10/1/18
Valley	Fresno	American Avenue Disposal Site	Kerman	8/20/18	9/25/18
Valley	Fresno	Cedar Avenue Recycling and Transfer	Manteca	8/21/18	9/26/18
Valley	San Joaquin	Lovelace Transfer Station	Stockton	9/12/18	9/17/18

*The GreenWaste scalehouse tracks vehicles with sufficient detail that scalehouse records were used instead of in-person vehicle surveys.
**Vehicle surveys were done at West Miramar but staff were unable to coordinate with the facility for waste sampling.

Multi-family Waste Sites

Selecting Multi-Family Sites

Multi-family site sampling was done in conjunction with facility sampling, with multi-family samples collected and characterized during the one or two days spent at each primarily unprocessed waste facility. CalRecycle developed a list of multi-family apartment buildings to recruit for the study, with a multi-family site defined as a building consisting of five or more dwelling units. A list of potential multi-family sampling locations was created for each of the 34 waste facilities using the ReferenceUSAGov.com database:

- Search for all apartments (specific business group in database) within a five-mile radius of each waste sampling facility recruited for the study (See Table 22).

- If less than one hundred listings are returned, increase the radius in five-mile increments until one hundred or more listings are returned.
- Export all records and confirm that they are within the county of interest (where waste facility is located). Exclude any records outside of the county.
- Randomize the order of listings and sort the random numbers from least to greatest.

Recruiting Multi-Family Properties

After creating the list, CalRecycle began contacting multi-family sites based on the randomized ordering to determine their willingness to participate in the study. If the contact information provided by the ReferenceUSAGov.com database was not valid, staff used any contact information available from online searches. Once in contact, staff spoke to a manager, asked for their participation, and then determined if the site was eligible. For a site to be eligible it needed to:

- Generate over 200 pounds of trash between waste pickups (amount required for sample)
- Have dumpsters the sampling team could access during business hours
- Experience no to minimal illegal dumping (managers knew if this was an issue). Due to this requirement, many of the sites chosen were gated or had gated dumpsters that were not accessible to non-residents.

Willingness to participate in the multi-family sampling was very low, often due to: difficulty in reaching a manager at a site (many contacts ended with a voicemail), privacy concerns, and perceived effort needed to get approval from corporate management or coordinate with sampling team. Combined with the eligibility requirements, it was not uncommon for staff to contact 50-75 facilities to recruit one eligible multi-family site.

Staff recruited two sites per waste facility, with one serving as a “backup” site. The field sampling team chose one of the sites to sample, generally based on estimated amount of trash available on the planned sampling day and the distance of the site from the waste facility. For some waste facilities, only one multi-family site was recruited due to time limitations.

Multi-family Site Scheduling and Logistics

Forty multi-family site samples were collected in conjunction with the waste facility sampling from September - November 2018. One site sample was collected in April 2019 due to recruitment difficulty.

After a multi-family site was confirmed eligible, staff collected additional information to: (1) determine logistics for collecting the waste sample and (2) quantify disposal patterns at the site. The information collected included:

- General Information
    - Name and physical address of the property
    - Names and contact information for the person(s) who could grant permission for participation in the study, the person(s) who could supply data related to waste disposal practices and quantities, and the person(s) who could assist directly with on-site measurement and sampling visits
- Analytical Information
    - Number and approximate size of containers for landfill waste (trash bins or dumpsters)
- Days and times of scheduled waste collection
    - Name of hauling company that serves the location
    - Total number of units and the number of occupied units
    - Use of compactors or roll-off containers for landfill waste
- Logistical Information
    - Hours that waste containers are accessible to contractors and presence of any barriers (gates, locks, guards, etc.)
    - Layout of the site and location of waste containers (and site map if available)
    - Steps needed to access waste containers when not easily accessible

Participants were informed that all study data would be recorded anonymously and identifying information would not be published.

Materials Recovery Facilities (MRF)

Selecting MRFs

CalRecycle selected materials recovery facilities (MRFs) to participate in the study from a list of permitted facilities in the Bay Area and Southern regions. Sites included in the MRF recruitment included mixed waste processors, single and dual stream recyclables processors, construction and demolition debris (C&D) processors, and organic waste processors. The goal was to recruit a variety of facilities that represented the breadth of processing techniques and equipment.

Recruiting MRF Sites

To recruit potential facilities, CalRecycle staff conducted telephone interviews with personnel at each facility (see questionnaire in Appendix C: Forms Used in the Study). Facilities were screened for eligibility based on the following minimum criteria:

- The site processes materials for recovery and the unrecovered materials (i.e. residuals) are aggregated and transferred for disposal;
- It was possible to obtain credible residual tonnage data; and
- It was possible to perform sampling and sorting at the site.

If a facility met the minimum criteria and agreed to participate, additional information was obtained:

- Written directions to the facility;
- The facility's days and hours of operation;
- Contact information for: facility owner, an employee with the authority to permit use of the facility, an employee who can provide site data, and an employee for day-of coordination assistance and logistics;
- An agreed upon plan and location for performing the surveying, sampling, and sorting at the facility (with proximity to shelter and restrooms);
- Availability of a loader and operator to assist with moving samples;
- Information about recycling or recovery operations at the facility, and how the study team may obtain samples of residuals; and
- Unusual conditions (e.g., weather, anomalies in traffic patterns) that might affect data collection.

If the selected facility was unwilling or unable to accommodate the study conditions, the next eligible MRF was recruited.

The final list of recruited facilities is shown in Table 24.

Table 24. Recruited MRF's and Sampling Dates

Region	County	Facility	City	Type of Processor	Sampling Dates
Bay Area	Santa Clara	SMaRT Station	Sunnyvale	Mixed Waste Processing	4/4-4/5/19
Bay Area	Santa Clara	GreenWaste Transfer and Recycling Center	San Jose	Mixed Waste Processing	4/8-4/9/19
Bay Area	Santa Clara	Premier Recycling	San Jose	C&D Debris Processing	4/11-4/12/19
Bay Area	Alameda	Community Conservation Center Berkeley Recycling	Berkeley	Dual Stream Recycling	4/7/19 & 4/13/19
Southern	Riverside	Agua Mansa MRF	Riverside	C&D Debris Processing and Organics Processing	4/22-4/24/19
Southern	Los Angeles	Bradley East Processing	Sun Valley	Organics Processing	4/17-4/18/19
Southern	Los Angeles	Grand Central Recycling	City of Industry	Mixed Waste Processing	4/25-4/26/19
Southern	Los Angeles	Athens Services Sun Valley Waste	Sun Valley	Mixed Waste Processing	4/19-4/20/19
Southern	Los Angeles	Sun Valley Paper Stock	Sun Valley	Single Stream Recycling	4/15-4/16/19

MRF Scheduling and Logistics

After CalRecycle recruited the MRFs, the Cascadia project team visited each facility to review all site logistics, inspect the residual ejection points, collect available inbound and residual tonnage data, and outline a data collection plan for each facility. An example data collection plan is included in Appendix C: Forms Used in the Study. The MRF pre-sampling visits occurred in March 2019 and sampling was completed in April 2019. Nineteen days were spent sampling, approximately two days per facility.

The sampling dates at each facility are shown in Table 24 above.

Sample Allocations - All Sectors

The number of samples allocated to each facility by waste sector and region is presented in Table 25. The field crew planned to complete three single-family samples, one multi-family sample, seven commercial samples, and eleven self-haul samples per day at each primarily unprocessed waste facility. One self-haul load each day was planned to be both hand sorted and visually characterized. Due to the typical homogeneity of materials found in self-haul samples, only the self-haul sector was visually characterized. See *Visual Characterization Procedure* below for more information regarding visually characterized samples. Due to logistics, actual sample counts varied (see below) and a higher proportion of visual sorts were performed than planned; see Appendix D: Special Considerations for more information. In general, the number of expected samples was allocated to each site depending on the number of sampling days. Some facilities did not accept self-haul loads so the self-haul allocation was increased at other facilities in the region to ensure that the overall self-haul sample target was achieved.

For the residual sampling portion of the study, the field crew planned to complete nine residuals samples per day at each MRF. The actual counts are shown in Table 25.

Table 25. Sample Allocations by Facility and Sector

Region	County	Facility	Single-Family	Multi-family	Comm-ercial	Self-haul*	C&D Residual	Recycling Residual	Organics Residual	Mixed Waste Residual
Bay Area	Alameda	Davis St. Transfer & Recovery	6	2	15	20/2				
Bay Area	San Francisco	Recology Transfer & Recycle	2	0	8	9/2				
Bay Area	Santa Clara	Guadalupe Sanitary Landfill	4	1	6	20/1				
Bay Area	Contra Costa	Contra Costa Transfer Station	3	1	6	12/2				
Bay Area	Contra Costa	Mount Diablo Transfer Station	3	1	7	13/1				
Bay Area	Santa Clara	GreenWaste Transfer & Recycle	3	2	7	0				
Bay Area	Santa Clara	SMaRT Station					0	0	0	19
Bay Area	Santa Clara	GreenWaste Transfer & Recycle					0	0	0	19
Bay Area	Santa Clara	Premier Recycling					28	0	0	0
Bay Area	Alameda	Community Conservation Center Berkeley Recycling					0	20	0	0
Coastal	Monterey	Monterey Peninsula Landfill	3	1	7	10/1				
Coastal	Santa Barbara	Santa Maria Landfill	4	1	7	12/1				
Mountain	El Dorado	Western El Dorado Recovery Systems MRF	0	1	10	10/1				
Mountain	Nevada	McCourtney Road Transfer Station	6	1	3	10/1				
Southern	Los Angeles	Puente Hills Material Recovery	6	2	16	20/2				

Region	County	Facility	Single-Family	Multi-family	Comm-ercial	Self-haul*	C&D Residual	Recycling Residual	Organics Residual	Mixed Waste Residual
Southern	Los Angeles	Chiquita Canyon Landfill	3	2	5	6/1				
Southern	Los Angeles	Calabasas Landfill	4	0	7	20/1				
Southern	Los Angeles	Athens Services Sun Valley Waste	2	1	9	0				
Southern	San Diego	Sycamore Landfill	0	1	10	10/1				
Southern	San Diego	Otay Landfill	12	3	17	30/4				
Southern	Orange	CVT Regional Transfer Station	6	2	14	20/2				
Southern	Orange	Olinda Alpha Landfill	2	2	8	10/1				
Southern	Orange	Frank R. Bowerman Landfill	4	0	7	10/1				
Southern	Riverside	Robert Nelson Transfer Station	6	3	13	24/2				
Southern	Riverside	El Sobrante Landfill	3	1	7	12/1				
Southern	Riverside	Moreno Valley Transfer Station	3	0	8	3/1				
Southern	San Bernardino	West Valley MRF	6	2	15	22/2				
Southern	San Bernardino	Victorville Sanitary Landfill	3	1	7	10/1				
Southern	San Bernardino	Inland Regional Transfer Station	3	1	6	9/2				
Southern	Ventura	Del Norte Regional Recycling and Transfer	4	1	7	15/1				
Southern	Riverside	Agua Mansa MRF					21	0	18	0
Southern	Los Angeles	Bradley East Processing					0	0	20	0

Region	County	Facility	Single-Family	Multi-family	Comm-ercial	Self-haul*	C&D Residual	Recycling Residual	Organics Residual	Mixed Waste Residual
Southern	Los Angeles	Grand Central Recycling					0	0	0	18
Southern	Los Angeles	Athens Services Sun Valley Waste					0	0	0	20
Southern	Los Angeles	Sun Valley Paper Stock					0	18	0	0
Valley	Sacramento	Elder Creek Transfer Station	2	2	7	10/1				
Valley	Sacramento	North Area Transfer Station	4	0	7	8/1				
Valley	Kern	Bakersfield Metropolitan SLF (BENA)	4	0	7	10/1				
Valley	Kern	Shafter-Wasco Landfill	2	2	7	10/1				
Valley	Fresno	American Avenue Disposal Site	2	2	8	11/1				
Valley	Fresno	Cedar Avenue Recycling and Transfer	4	0	6	10/1				
Valley	San Joaquin	Lovelace Transfer Station	3	1	7	11/1				
Totals			**122**	**40**	**281**	**449**	**49**	**38**	**38**	**76**

*For self haul samples, sample count is denoted as: visual characterization quantity/hand sort quantity.

Vehicle Surveys

Vehicle survey data was gathered to help determine the percentage of a facility's waste inflow that came from the residential, commercial, and self-haul sectors. This information, along with any vehicle log/transaction receipt, was provided by the facility to CalRecycle staff and was used to calculate an estimated sector breakdown of incoming waste for each facility and subsequently used to estimate each sample region.

The survey team consisted of three Cascadia staff members. Often all three surveyed a facility together and monitored all scales and gates, but occasionally the staff split up to cover several facilities in one day.

Cascadia staff surveyed all vehicles coming through one entrance of the facility and collected tonnage and source sector data for one complete day (open to close). If the facility had multiple gates, then the Cascadia surveyor rotated hourly among the gates. Cascadia surveyed 33 of 34 facilities, one facility collected sufficient incoming vehicle data and were used in lieu of a survey.

Prior to beginning the day's survey, the surveyor verified the scale house's procedures:

- The procedure for obtaining vehicle net weights
- Any rules the facility used for assigning a minimum net weight to certain types of vehicles, such as those carrying residential self-hauled loads
- Any rules governing the assignment of *net volume* estimates instead of net weights

For each vehicle, the surveyor collected the following information:

- The jurisdiction from which the trash originated
- The waste sector (franchised residential, franchised commercial, self-haul or MRF processing residuals) and subsector (single-family residential, multi-family residential)
- In cases where loads were comprised of waste from multiple sectors, the estimated proportions of the sectors represented in the load
- The vehicle type (e.g. front loader)
- An example of the *Vehicle Survey Form* that was used to collect the data is included in Appendix C: Forms Used in the Study.

At most of the facilities, the surveyor obtained net weights for vehicles by observing the weighing process at the scalehouse and recording the weight at that time. In other cases, the surveyor coordinated with scalehouse personnel to obtain weight tickets (transaction receipts) corresponding to every load of waste brought to the facility.

All vehicles carrying materials destined for disposal to that facility were surveyed unless the disposed waste was transferred from another primarily unprocessed waste facility or it originated from a transfer station. Additionally, the survey did not include loads of

material destined for recycling, recovery, or alternate daily cover. If there were any incoming loads with material that the facility staff diverted from disposal, like mattresses or scrap metal, the surveyors recorded the actual amount of material disposed from the load by subtracting the estimated amount of material recovered (with the assistance of the scale house).

Additionally, CalRecycle staff contacted facility operators to obtain additional transaction receipts to further augment the vehicle survey data. Records that were detailed and provided clear breakdowns of vehicle source sectors were combined with vehicle survey data to provide a more accurate average of the source sector breakdown from that facility. See Appendix D: Special Considerations for additional information.

Data Quality Control

The field team implemented several protocols to ensure the integrity of the data collected in the field, including checking survey forms in the field and at the end of each day for accuracy and to ensure that all appropriate information was gathered. The project manager performed an additional check of the surveys to confirm that all the required data was properly entered.

Staff Numbers and Training

Staff Numbers

Cascadia staff managed all field work. The field data collection team consisted of:

- Two Cascadia professional staff, one to supervise sorting and weighing and one to supervise load and sample selection. These staff have prior waste characterization supervisory experience.
- Four sorting staff from local temporary labor agencies (with industrial sector experience). To the extent possible, the same sorting staff were used throughout the study.

Staff Training

Cascadia staff spent two days prior to the start of sampling reviewing and training any new personnel in the sampling and sorting protocols. All sorting staff received ongoing feedback and training designed to maximize the accuracy, precision, and efficiency of field operations during the course of the study.

Equipment

The items listed below were brought to each facility for sampling and sorting waste.

Set Up	Safety Gear	Tools
Cargo Van	Tyvek Suits	Shovels
Sort Table (4'x8'base with legs)	Hard Hats	Brooms
18 Gallon Sort Bins	Safety Vests	Digital Cameras
30 Gallon Sort Bins	Safety Glasses	Toughbook Computer
40 Gallon Carry Barrels	Dust Masks	Clipboards
96 Gallon Toters	Puncture Resistant Gloves	Replacement Batteries
Digital Scales (weighs to 0.1lb)	Glove Liners	Marking Paint
Tarps	Steel Toed Boots	Stapler
Plastic Sheeting (10'x10')	Safety/Medical Kit	Duct Tape
	Hand Wipes and Sanitizer	
	Sunblock	
	Cooler with Drinks	

Obtaining and Sorting Samples

Sampling Primarily Unprocessed Waste Facilities

Diverting Selected Loads

A systematic selection procedure was used to choose which vehicles to sample. First, a sampling interval for each waste sector was established to determine vehicle sampling frequency. Sampling intervals were determined by dividing the total number of trucks from each sector arriving at the facility each day—estimated from the vehicle surveys—by the number of samples needed each day. The resulting number is the sampling frequency. For example, if the vehicle survey found that approximately 50 trucks with residential franchised waste arrive, on average, per day and 5 samples were needed, it would be approximated that every 10th vehicle be diverted for sampling. This strategy is termed "selecting every n^{th} vehicle" within a waste sector. Every time one of the selected n^{th} vehicles in each waste sector arrived, the sorting staff directed the driver to the sampling area. This method was generally followed for most facilities, see Appendix D: Special Considerations for information regarding other scenarios. The vehicle information, including any unusual circumstances associated with the load or the sample, was recorded using a cloud-based data management tool.

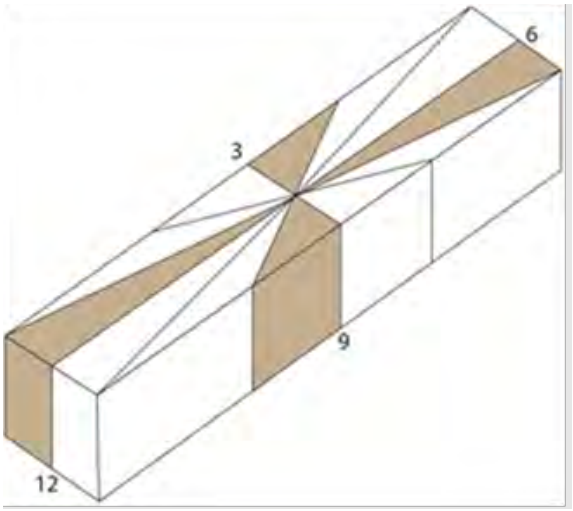
See Appendix C: Forms Used in the Study for an example of a *Vehicle Selection Form* that specifies the intervals chosen for a particular day of sampling.

Obtaining Waste Samples, Adequate Sample Weights

For loads of visually characterized material (not hand sorted) from the self-haul sector, the entire load was considered one sample. The field team planned to hand sort and visually characterize the first self-haul load of each day that weighed less than 400 pounds. These samples were recorded as two individual samples, one sample of visual characterization and one of hand sorting. This process was intended to cross-check hand sorts and visual sorts. Due to issues with the sampling procedure, the cross-check was unable to be completed. See Appendix D: Special Considerations for more information.

Loads from residential and commercial sectors were tipped into an elongated pile in the designated area. A representative sample weighing at least 200 pounds was collected from each selected load based on a systematic "grab" from the perimeter of the load. Essentially, four subsamples of approximately 50 pounds were collected by systematically rotating around each load as shown in Figure 9 and the subsamples were then combined. If the tipped pile was viewed from the top as a clock face with 12 o'clock being the part of the load closest to the front of the truck, the first sample would be taken at the 12 o'clock position. Subsequent samples would be collected from 3 o'clock, 6 o'clock, and 9 o'clock. For the next four loads, the extraction point would shift to 1 o'clock, 4 o'clock, 7 o'clock, 10 o'clock, and so on. Samples were removed from the pile either by hand or with the assistance of a loader operator at the site. Samples were then placed on a tarp or in totes.

Figure 9. Systematic Sampling Procedure for Incoming Loads



Sampling Multi-Family Sites

The field data collection team completed two tasks during each multi-family site visit: measured the total quantity of waste destined for disposal set out for collection and obtained a representative sample of this material. The details of these two procedures are described below.

Quantifying Disposed Waste

The field team observed and recorded the volume of all waste material destined for disposal that was present at the multi-family site shortly before scheduled collection by the hauler. Using the calculated volume, along with the information recorded from each multi-family site on frequency and timing of waste pickups, CalRecycle calculated the annual disposed waste tonnage for each multi-family site and extrapolated these results to multi-family sites across the state. The procedure to calculate waste volume is described below:

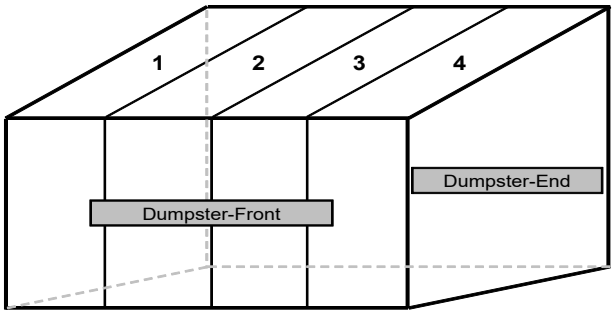
- Field staff recorded the length, width, and height to the nearest inch for all disposed waste in dumpsters at each site to calculate the volume of disposed waste at each site. The dimensions were recorded on a *Multi-family Site Visit Form*. (See Appendix C: Forms Used in the Study for an example of a *Multi-family Site Visit Form*.)

Collecting Waste Samples

Field staff inspected all the site's waste containers to determine whether any substantial differences existed. If clear differences were observed, then subsamples from multiple containers were collected to ensure a representative sample. In most cases, the waste sample was taken from a single container, chosen at random.

To collect a sample, the field crew randomly chose a vertical cross section, or "slice", of the container contents. An illustration of the slices is shown in Figure 10. The sample needed to weigh at least 200 pounds, but if the entire container had less than 200 pounds of waste, field staff took waste from other containers until the 200 pound sample requirement was met. If a multi-family site had considerably less than 200 pounds of waste at the time of the visit, the field crew collected all material available and then returned later to collect enough material for their sample. The crew returned to the solid waste facility and hand-sorted the multi-family sample using the same protocol as the samples of waste from other sectors.

Figure 10. Example Dumpster with Slices Illustrated



Note: In some cases, the field staff coordinated unique sampling arrangements with the multi-family sites to ensure that suitable samples were available for selection and sorting. For example, if the site used a compactor, the field staff provided rolling carts

for the site to place their waste and then selected samples from the material that accumulated in the rolling containers.

Sampling at MRFs

At material recovery facilities, only residual streams were sampled. Residual streams are defined as any waste generated from mixed material processing that are disposed in a landfill. These included post-processing residual waste, pre-line removal, overs, unders, and other materials separated for disposal during MRF operations. Fines less than 2 inches in diameter were characterized as MRF fines and not sorted any further. The procedure for collecting MRF residuals samples varied by facility so a collection plan was created for each. The field data collection team generally followed the process outlined below:

1. **Identified all residual streams and ejection points** at each facility. Ejection points are the areas where materials are removed or ejected from the processing line.

2. **Obtained or estimated annual tonnages** of material from each ejection point. If annual tonnage estimates for each point were not available, the field staff worked with the operator to allocate total residual tonnage to each residual stream/ejection point. Allocations were based on volumetric accumulation quantities and weight-based conversion factors (using either published data or on-site measured estimates). See Appendix E: Volumetric Conversion Factors for conversion factors used.

3. **Determined sample weights** for each ejection point. Sample weights were 125 pounds unless an ejection point produced only homogenous materials less than 6 inches in diameter. In this case, the sample weight was 25 pounds.

4. **Selected samples using one of the following methods**—stockpile or direct load—described in detail below.

Stockpile Sample Collection Method

The field data collection team used the following sampling procedure at facilities with stockpiled residual streams, meaning residual material was collected and stored before the field team arrived.

1. Visually superimposed the 16-cell grid (pictured in Figure 11 on a photograph of the stockpiled residual streams to identify sampling cells prior to extracting grab samples. *(Please note that this is an overhead view)*

2. Selected three cells for sampling using a random number generator, and collected one grab sample from each of approximately similar weight. These three grab samples were used to produce a single composite sample and a combined weight was recorded. The combined sample needed to meet the minimum sample weight for residuals required for this study.

3. Collected a minimum of eight to ten composite samples over the course of a processing shift. Note: Eight composite samples requires extracting 24

individual grab samples from the residual stockpile. Ten composite samples requires 30 individual grab samples.

Figure 11. Visual overlay for Stockpile Method showing "cells" of material

Direct Load Method

At these facilities, field staff extracted samples from a minimum of 20 cubic yards of processing residual. The field data collection team used the following sampling procedure at facilities that loaded residual streams directly into a transport trailer or other container.

1. Leveled processing residual already loaded in a trailer to a uniform height and extended the material in one direction to create a roughly rectangular shape.
2. Visually superimposed the three-dimensional grid pictured in Figure 12 on the processing residual. *(Please note that this is a side view, facing the left-hand side of the trailer*)
3. Selected three cells for sampling using a random number generator, and collected one grab sample from each of approximately similar weight. These three grab samples were used to produce a single composite sample and a combined weight was recorded. The combined sample needed to meet the minimum sample weight for residuals required for this study.
4. Collected eight to ten composite samples.

Figure 12. Visual overlay for Direct Load Method showing "cells" of material

Sorting Samples and Recording Data

Hand Sort Procedure

Figure 13 Sample to be Sorted

After a sample is collected and placed on a tarp or in totes, the field crew photographed the sample with the sample ID visible. The material was sorted by hand into the defined material types (see Appendix B: List and Definitions of Material Types). Sorting crew members sorted the contents of each sample and placed each material type in the appropriate area or tub (see Figure 14 for a typical table and tub sorting arrangement). Each team member was typically assigned to extract items belonging to a single material class, such as paper or plastic.

Figure 14: Sort Table and Tubs

The field crew supervisor monitored the consistency and accuracy of sorting and directed re-sorting if materials were improperly classified.
If two items were discarded together, but could be easily and reasonably separated (e.g. plastic bag with screws inside), then the field crew would separate them. If an item could not be separated, the category was determined by the dominant material type.

The tubs holding each material category were weighed (accounting for each tub's tare weight) on a set of scales that were calibrated to an accuracy within one-tenth of a pound. The field crew supervisor recorded composition weights and the information obtained from the driver on the cloud-based data management tool.

Visual Characterization Procedure

The field data collection crew's process for visually characterizing self-haul loads generally included the following steps:

- A member of the field crew took photographs of the entire sample with the sample ID visible in the photo.
- A member of the field crew measured the length, width, and height of the sample and recorded the total volume in the cloud-based data management tool.
- The field crew walked around the entire load and noted the major material classes that were present in the load. Major materials classes were: paper, glass, metal, plastic, electronics, organics, inerts, HHW, special waste, and miscellaneous.
- The field crew estimated and recorded the volume percentage of the material class with the greatest observed volume in the load. This process was repeated for all visible material classes in order of volume. The sum of the estimated volumes needed to equal 100 percent.
- Next, the crewmember considered each material class separately and estimated the percentage of each material class that was made up of each material type. For example, *newspaper and newspaper inserts* is a material type within the paper material class. While considering only the paper material class, the crewmember would estimate the volume percentage of

paper materials that was composed of *newspaper*. The field crew then did the same for every other material type within the paper material class (such as *paper grocery bags*). The total of percentages for all of the material types must equal 100 percent.

- Volumetric to weight conversion factors were used to estimate the weight of each material type from volume percentages. A list of conversion factors can be found in Appendix E: Volumetric Conversion Factors.

The study assumes any hand-sorted samples from the self-haul sector are also representative of the entire load. With this assumption we can maintain comparability with visually characterized samples. See Appendix C: Special Considerations for the effects of this assumption on the self-haul sector.
For more background on how samples are visually characterized, a more detailed methodology can be found in the 2006 Method of Visual Characterization of Disposed Waste from Construction and Demolition Activities.

Field Work Quality Assurance & Quality Control

The data collection crew used many strategies to ensure accuracy and efficiency in the data collection process. The steps taken included:

- Pre-visiting sites and developing a daily plan to confirm that there will be enough vehicles to choose from on any particular sampling day
- Interviewing the drivers of selected vehicles for sampling when the vehicle arrives (i.e., after staff at the gatehouse have directed the vehicle to the sampling crew) to verify sample information, such as generating sector and the type of waste load
- Maintaining clear lines of communication between the sorting crew and gatehouse personnel through two-way radios or cell phones with text messaging to immediately resolve any questions about vehicle selection
- Pre-weighing the sample to make sure it met the minimum weight criterion before sorting
- Training the entire sampling crew in the definitions of each material, and referring to the written definitions as often as needed during sorting
- Assigning one dedicated field crew member to read and record the weight of each material weighed after sorting

Description of Calculations and Statistical Procedures Used

Data from vehicle surveys, facility tonnage reports, and the sorting of waste samples were analyzed to yield estimates of percentages and tonnages of material types in California's waste stream. This section describes the methodology used to obtain each estimate and its associated confidence interval.

The general calculation strategy involved two common themes: (1) the use of ratio estimators to determine the composition percentages of the waste stream; and (2) aggregation of sample data from the regional level to the statewide level. A ratio estimator involves the ratio of two quantities, both of which are random variables. For most of the steps in the analysis, the basic ratio estimator was derived as the ratio of the weight of material in a given sample over the total weight of the sample. The general procedure involved creating a new ratio estimator by weighting across ratios from a lower level. For example, statewide ratio estimators were created by weighting the region-level ratio estimators.

Quantifying Disposed Waste

Disposed waste from each sector was quantified through the use of vehicle surveys and tonnage reports at the facilities participating in the study. The calculation method is described below.

Aggregating Survey Records to Produce Findings at the Facility Level

For a given facility on a given day, each vehicle that was included in the gatehouse survey had its net weight of waste assigned to one or more of the established waste sectors, according to the response of the driver. Thus, the tonnage from each vehicle was assigned or apportioned to one or more of the franchised commercial, franchised single-family residential, franchised multi-family residential, or self-haul sectors. The tonnages identified through the survey were used to calculate the relative proportions of the waste stream associated with each sector.

Transaction receipts from facilities supplemented survey data with additional information on the quantities of franchised-collected compared to self-hauled tonnages. All surveys were completed on weekdays, so transaction receipts for both weekdays and weekend days were requested from all facilities. CalRecycle staff determined the proportion tonnages on those additional days brought by franchised haulers and by self-hauled vehicles. These estimates were used to improve the overall breakdown between franchised and self-hauled vehicles over the whole week, including weekends. The weekend information improves the overall proportion estimates by providing a more accurate picture of the breakdown between franchised and self-haulers on weekends. While most tonnage is brought by franchised haulers on weekdays, tonnage from self-hauled vehicles is typically higher on weekend days. The method is described below:

- Using survey data from all days (weekday and weekend), the relative proportion of waste brought by franchised haulers and self-haulers are assigned to each relevant sector.
- Survey proportions were combined with the franchised and self-hauled tonnages from transaction receipts to derive additional "days" of data with an actual category tonnage (from transaction receipts) and estimated sector tonnages.
- The tonnages from survey days and transaction receipts were summed for each facility, by weekday and weekend day, and then divided by the total number of "days" of data to derive an average weekday and average weekend day for each facility.

The projection of waste tonnage for an average weekday, based on the vehicle survey and supplementary information, was scaled up by the number of weekdays per week a given facility is open (typically five) to produce an estimate of tonnages for each type of waste for all weekdays during a given week.

Similarly, the projection of waste tonnage for an average weekend day, based on the vehicle survey and supplementary information, was scaled up by the number of weekend days a given facility is open to produce an estimate of tonnages for each type of waste for all weekend days a waste facility was open during a given week.

The weekday and weekend day tonnages were summed to produce a composite set of estimates of the amount of waste from each sector arriving at the solid waste facility over a representative week. These tonnages were converted to relative proportions.

Each facility's tonnage figures for direct-haul disposed waste were obtained or estimated for the calendar year 2018 minus any disaster debris tonnage, as the field team did not sample disaster-related waste. This information was obtained from the facilities themselves, from county databases, or from information reported to CalRecycle through landfill or station reports as part of DRS. The relative proportions described above were applied to these figures to produce estimates of the tons of direct-haul disposed waste associated with each sector at the facility in question.

Example of Estimating Sector Proportions at the Facility Level

For example, imagine that Facility A was visited on two weekdays. Suppose that Facility A also provided transaction receipts for one additional weekday and one additional weekend day (though the field crew was not present on those days). The following scenario describes how the percentages of waste for each sector were calculated for this facility. Example numbers are rounded and decimals are not carried through calculations.

First, survey data from the facility for the two weekdays the study crew was present were examined to determine the tons associated with the studied sectors and subsectors.

Facility A	Commercial	Single-Family Residential	Multi-Family Residential	Self-Haul	Total
Surveyed Tonnage from Weekday 1	20	20	20	15	**75**
Surveyed Tonnage from Weekday 2	30	15	25	20	**175**
Tonnage for Two Weekdays	**50**	**35**	**45**	**35**	**165**

Next, the tonnages were converted into percentages, as shown below.

Facility A	Commercial	Single-Family Residential	Multi-Family Residential	Self-Haul	Total
Tonnage for Two Weekdays	50	35	45	35	**165**
Percentages	**30%**	**21%**	**27%**	**21%**	**100%**

These percentages were then applied to the franchised and self-hauled tonnages from additional day transaction receipts supplied by the facility. If daily tonnages could be discerned from transaction receipts and could be allocated to specific sectors, then those tons are combined with vehicle survey data in lieu of this step.

Facility A	Commercial	Single-Family Residential	Multi-Family Residential	Self-Haul
Tonnage from Additional Weekday Records	100	100	100	50
Calculation	100x0.30**=30**	100x0.21**=21**	100x0.27**=27**	50x0.21**=11**
Tonnage from Additional Weekend Day Records	50	50	50	100
Calculation	50x0.30**=15**	50x0.21**=11**	50x0.27**=14**	100x0.21**=21**

The calculated daily tonnages were averaged to create typical weekdays and weekend days. First, the average weekday tonnage was calculated from the three weekday tonnage numbers calculated above. Next, the average weekday tonnage was multiplied by the number of weekdays the facility is open. The process was repeated for the weekend days using weekend day tonnage information. An average week was then constructed by summing the weekday tonnage number and the weekend day tonnage number. For this example, suppose that Facility A operates from Monday through Saturday, or five weekdays and one weekend day.

Facility A	Commercial	Single-Family Residential	Multi-Family Residential	Self-Haul
Average Weekday Tonnage	(20+30+30)/3 **=27**	(20+15+21)/3 **=19**	(20+15+27)/3 **=21**	(15+20+11)/3 **=15**
Average Weekend Day Tonnage	(15)/1**=15**	(11)/1**=11**	(14)/1**=14**	(21)/1**=21**
Average Weekly Tonnage	(27*5)+(15*1) **=150**	(19*5)+(11*1) **=106**	(21*5)+(14*1) **=119**	(15*5)+(21*1) **=96**

The average weekly tonnage for each facility was converted to percentages for each sector and then multiplied by the total tons of direct haul waste disposed by that facility in 2018, according to data from DRS or other data as described above. Suppose that Facility A accepted 500,000 tons of direct haul waste in 2018. The amounts assigned to each sector are shown in the table below.

Facility A	Commercial	Single-Family Residential	Multi-Family Residential	Self-Haul	Total
Average Weekly Tonnage	150	106	119	96	**471**
Percentage of Facility Tonnage	32%	23%	25%	20%	**100%**
Annual Tonnage	**160,000**	**115,000**	**125,000**	**100,000**	**500,000**

Aggregating Tonnage from Facilities to Produce Findings at the Regional Level

Tonnage estimates for each type of waste were combined for participating facilities within each region, using a weighted averaging method. The tonnage estimates for each type of waste at all participating facilities within a region were aggregated, and relative proportions were calculated for each sector and subsector. The aggregated proportions for each sector and subsector were then applied to the total 2018 disposal figure for amounts disposed at landfills in the region, as drawn from DRS.

For example, hypothetical annual tonnages by subsector for two facilities visited in a region are shown in the table below.

N/A	Commercial	Single-Family Residential	Multi-Family Residential	Self-Haul	Total
Facility A	160,000	115,000	125,000	100,000	500,000
Facility B	150,000	80,000	10,000	30,000	275,000
Total (tons)	**310,000**	**195,000**	**135,000**	**130,000**	**770,000**
% of Total	**40%**	**25%**	**18%**	**17%**	**100%**

Using an annual tonnage for this region of 2,000,000 tons, we can assign tonnages to sectors according to the percentages from the survey data.

Region 1	Commercial	Single-Family Residential	Multi-Family Residential	Self-Haul	Total
Percent	40%	25%	18%	17%	100%
Tons	800,000	500,000	360,000	340,000	2,000,000

Aggregating Regional Findings to Produce Sector Tonnage Estimates Statewide

The relative proportions of disposed waste corresponding to each sector were combined among regions using a weighted aggregation method. The weightings associated with each region were proportional to the total disposed tonnage for the region for calendar year 2018. This step resulted in a final set of proportions reflecting the relative disposal of waste corresponding to each waste sector statewide. The proportions were then multiplied by the total 2018 statewide disposal figure to produce the statewide tonnage estimate associated with each sector.

The 2018 figures for disposed tonnage associated with each region, as drawn from DRS, are shown in Table 26.

Table 268. Total Waste Disposal (Tons) in Bay Area Region, 2018

County	Total Waste Disposal (tons)
Alameda	1,358,042
Contra Costa	875,937
Marin	250,496
Napa	231,786
San Francisco	740,413
San Mateo	598,870
Santa Clara	1,514,029
Solano	442,349
Sonoma	377,996
Total	**6,389,918 (16.3%)**

Table 27. Total Waste Disposal (Tons) in Central Valley Region, 2018

County	Total Waste Disposal (tons)
Butte	210,703
Colusa	23,695
Fresno	881,206
Glenn	23,232
Kern	1,036,801
Kings	108,807
Madera	144,205
Merced	264,645
Placer	326,817
Sacramento	1,429,714
San Joaquin	906,801
Shasta	625,010
Stanislaus	632,319
Sutter	0
Tehama	59,132
Tulare	424,170
Yolo	201,741
Yuba	149,250
Total	**7,448,248 (19.0%)**

Table 28. Total Waste Disposal (Tons) in Coastal Region, 2018

County	Total Waste Disposal (tons)
Del Norte	20,133
Humboldt	105,701
Lake	47,268
Mendocino	66,832
Monterey	454,577
San Benito	86,457
San Luis Obispo	290,201
Santa Barbara	439,601
Santa Cruz	225,454
Total	**1,736,224 (4.4%)**

Table 29. Total Waste Disposal (Tons) in Mountain Region, 2018

County	Total Waste Disposal (tons)
Alpine	1,064
Amador	38,511
Calaveras	39,864
El Dorado	162,637
Inyo	20,887
Lassen	20,759
Mariposa	13,684
Modoc	5,469
Mono	23,082
Nevada	68,774
Plumas	21,940
Sierra	2,482
Siskiyou	26,920
Trinity	7,638
Tuolumne	45,827
Total	**499,538 (1.3%)**

Table 30. Total Waste Disposal (Tons) in Southern Region, 2018

County	Total Waste Disposal (tons)
Imperial	195,271
Los Angeles	10,754,509
Orange	3,385,364
Riverside	2,445,533
San Bernardino	1,953,881
San Diego	3,551,331
Ventura	944,639
Total	**23,230,528 (59.1%)**

Counties showing 0 tons disposed do not have local solid waste facilities and send waste to other counties. Percentages are relative to total statewide disposal for calendar year 2018.

Estimating Disposal Facility Waste Composition

Waste composition estimates were calculated using a method that gave equal weighting or "importance" to each sample within a given stratum. Confidence intervals were calculated based on assumptions of normality in the composition estimates.

In the descriptions of calculation methods, the following variables are used frequently:

- *i* denotes an individual sample
- *j* denotes the material type
- c_j is the weight of the material type *j* in a sample
- *w* is the weight of an entire sample
- r_j is the composition estimate for material *j* (*r* stands for *ratio*)
- *a* denotes a region of the state (*a* stands for *area*)
- *s* denotes a particular sector or subsector of the waste stream
- *n* denotes the number of samples in the particular group that is being analyzed at that step

Estimating the Composition

The following method was used to estimate the composition of waste belonging to the single-family residential, multi-family residential, commercial, and self-hauled sectors. For a given stratum (that is, for the samples belonging to the same waste sector within the same region), the composition estimate denoted by r_j represents the ratio of the component's weight to the total weight of all the samples in the stratum. This estimate was derived by summing each component's weight across all of the selected samples belonging to a given stratum and dividing by the sum of the total weight of waste for all of the samples in that stratum, as shown in the following equation:

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

where:

- c = weight of particular component
- w = sum of all component weights
- i = 1 to n, where n = number of selected samples
- j = 1 to m, where m = number of components

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

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

To find the composition estimate for the component *carpet*, the weights for that material are added for all selected samples and divided by the total sample weights of those samples. The resulting composition is 0.05, or 5 percent. In other words, 5 percent of the sampled material by weight is *carpet*. This finding is then projected onto the stratum being examined in this step of the analysis.

The confidence interval for this estimate was derived in two steps. First, the variance around the estimate was calculated, accounting for the fact that the ratio included two random variables (the component 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]. In this case the *finite population correction* is negligible.)

Second, precision levels at the 90 percent confidence level were calculated for a component'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 percent confidence level.

Composition results for strata were then combined, using a weighted averaging method, to estimate the composition of larger portions of the waste stream. The relative tonnages associated with each stratum served as the weighting factors. The calculation was performed as follows:

$$O_j = \left(p_1 * r_{j1}\right) + \left(p_2 * r_{j2}\right) + \left(p_3 * r_{j3}\right) + \ldots \quad (5)$$

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)
- *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 Carpet	5%	10%	10%
Tonnage	25,000	100,000	50,000
Proportion of Tonnage (*p*)	14.3%	57.1%	28.6%

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

Therefore, 9.3 percent of this examined portion of the waste stream is *carpet*.

The variance of the weighted average was calculated as follows:

$$\mathrm{Var}(O_j) = \left(p_1^2\ \mathrm{Var}(r_{j1})\right) + \left(p_2^2\ \mathrm{Var}(r_{j2})\right) + \left(p_3^2\ \mathrm{Var}(r_{j3})\right) + \ldots \quad (6)$$

Estimating Composition of Entire Statewide Disposed Waste Stream

Composition results for all waste sectors were combined, using a weighted averaging method, to estimate the composition of the entire statewide disposed waste stream. The relative tonnages associated with each sector served as the weighting factors. The calculation was performed as follows:

$$O_j = \left(p_1 * r_{j1}\right) + (p_2 * r_{j2}) + (p_3 * r_{j3}) + \ldots \quad (7)$$

where:

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

The following scenario illustrates the above equation. This example involves the component *carpet* in three waste sectors.

	Waste Sector 1	**Waste Sector 2**	**Waste Sector 3**
Ratio of Carpet (*r*)	0.05	0.10	0.15
Proportion of Tonnage (*p*)	0.50	0.25	0.25

So, it is estimated that 0.0875 or 8.75% of the entire waste stream is composed of *carpet*.

The variance of the weighted average was calculated as follows:

$$\mathrm{Var}(O_j) = \left(p_1^2 \ \mathrm{Var}(r_{j1})\right) + \left(p_2^2 \ \mathrm{Var}(r_{j2})\right) + \left(p_3^2 \ \mathrm{Var}(r_{j3})\right) + \ldots \quad (8)$$

Table 27 shows the weighting factors that result when 2018 survey data are applied to the 2018 tons for each region. These factors were applied to 2018 regional composition data, and the regional data was aggregated to the statewide level for each sector and for the overall waste stream.

Table 27: Tons by Sector and Region, Calculated Using 2018 Survey Data

Region	Single-Family	Multi-Family	Commercial	Self-Haul	Total
Bay Area	1,332,190	643,297	2,636,773	1,777,658	6,389,918
Coastal	388,535	39,251	1,018,226	290,213	1,736,224
Mountain	216,682	14,682	137,329	130,846	449,539
Southern	4,840,738	676,651	10,077,816	7,635,322	23,230,528
Valley	2,643,333	436,970	2,597,462	1,770,483	7,448,248
Total	9,421,478	1,810,852	16,467,606	11,604,521	39,304,457

Estimating MRF Residuals Composition

The residual composition for each MRF was calculated by weighting the percentage of material collected from each ejection point by the proportion of the facility's total residual ejected from each point.

MRF staff was asked to estimate annual throughput of each ejection point. If they could not estimate this, Cascadia extrapolated annual ejection point tonnage from transaction reports that recorded daily tonnage from each ejection point (see example below).

Facility A Example:

Ejection Point/ Residue Source	Estimated Annual Throughput
1	50
2	120
3	200
4	700

After sample data was collected, staff calculated the composition in percentages: the total tons of a material type 1 sampled at an ejection point divided by the total tons of material sampled at that ejection point (see below).

Sample of Ejection Point 1	Material Type 1	Material Type 2	Material Type 3	Total Weight of Sample
Sample 1	5	6	8	19
Sample 2	10	3	10	23
Sample 3	15	5	10	30
Sample 4	6	1	0	7
Total Tons Sampled	26	15	28	69
% of Ejection Point 1	**37.7%**	**21.7%**	**40.6%**	**100%**

The composition percentages were weighted by the annual throughput of each ejection point, and all the ejection points were combined to calculate one value for each material type for a facility (see below for example).

Ejection Point/Residue Source	Material Type 1 Proportion	Estimated Annual Throughput	Estimated Weight of Material Type 1
1	37.7%	50	18.55
2	15.3%	120	18.36
3	21.5%	200	43
4	8.0%	700	56
Total	**n/a**	**1070**	**135.91**

The total annual throughput for facility A is 1,070 tons. The total estimated weight of material type 1 in facility A's processing residuals is 135.91 tons. Therefore, material type 1 is 12.7% of facility A's processing residuals.

All facilities of the same MRF type (clean, mixed waste, etc.) were combined and values averaged to produce the final percentage composition of materials by MRF type.

MRF data is presented in percentages rather than absolute tonnage to avoid extrapolation of the data that could be used to determine the annual tonnage of residuals produced by the sampled MRFs.

Appendix B: List and Definitions of Material Types

Running Total	Order & Category Name	Material Type and Definition	Examples
1	P1 (Paper)	**Uncoated Corrugated Cardboard** means a 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. 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.	• cardboard packaging and containers • shipping and moving boxes • computer packaging cartons • sheets and pieces used as dividers in boxes • very clean pizza boxes
2	P2 (Paper)	**Paper Grocery Bags** means bags (usually brown) made from Kraft paper generally designed to carry out groceries from stores and that can be clearly identified as coming from a grocery store through the store's name or logo on the bag.	• paper grocery bags
3	P3 (Paper)	**Other Paper Bags/Kraft Paper** means bags made from Kraft paper that are not clearly identified as grocery bags, and sheets of Kraft paper. The paper may be brown (unbleached) or white (bleached). The paper may also be single layer or multi-layer (multiwall).	• single-layer bags that are not grocery bags (e.g. department store bags, paper lunch bag) • multiwall bags that do not have a plastic layer incorporated into the bags (e.g. used for shipping bulk products like pet food, rice, flour, and sugar) • heavyweight sheets of Kraft packing paper

Running Total	Order & Category Name	Material Type and Definition	Examples
4	P4 (Paper)	**Newspapers/Newspaper Inserts** means paper used in newspapers and all items made from newsprint.	• newspapers • glossy inserts found in newspapers • free advertising guides • election guides • plain news packing paper • college class schedules • telephone books • tax instruction booklets
5	P5 (Paper)	**White Office-type Paper and Mail** means white paper used in offices and mail. Does not include envelopes lined with plastic or bubble wrap.	• copy paper • computer printer paper • letter paper • business forms • white envelopes with or without clear windows
6	P6 (Paper)	**Magazines and Catalogs** means multi-page bound items (glued or stapled) made of glossy coated paper. This paper is usually slick, smooth to the touch, and reflects light.	• glossy magazines • catalogs • brochures • pamphlets
7	P7 (Paper)	**Folding Cartons and Other Paperboard Packaging** means paperboard boxes, other than corrugated, which fold and are typically used as the primary packaging for various products such as breakfast cereals, ice cream, frozen foods, candy, cookies, jewelry, tobacco, pharmaceuticals and cosmetics. It also includes non-box paperboard.	• paperboard boxes • tissue boxes • shoe boxes • paper-based tubes and cores (e.g. for toilet paper or paper towels) • paper clothing tags.

Running Total	Order & Category Name	Material Type and Definition	Examples
8	P8 (Paper)	**Other Recyclable Paper** means items made of paper that do not fit into any of the other paper types, but that are generally recyclable or not generally composted. Paper may be combined with minor amounts of other materials such as wax or glues. This type includes general office-type papers (other than white office-type paper and mail).	• colored ledger • manila folders and envelopes • index cards • lined or colored notebook paper and carbonless forms, • items made of chipboard • ground wood paper • deep-toned or fluorescent dyed paper • unused paper plates and cups • school construction paper • self-adhesive notes • hardcover and paperback books • phone books and directories • bagged shredded paper
9	P9 (Paper)	**Miscellaneous Paper Packaging** means packaging and packaging-related items that cannot be placed in other categories, that are usually combined with non-paper materials. Items may be contaminated with food or moisture.	• paper plates, cups, bowls, trays, take-out containers, etc. that clearly have a coating (usually shiny) • paper bags and boxes with a plastic component (e.g. lining, window, coating, etc.) • paper cigarette packs • paper frozen juice cans with metal ends

Running Total	Order & Category Name	Material Type and Definition	Examples
10	P10 (Paper)	**Aseptic Containers** means bleached polycoated paperboard containers or paper containers with a foil liner of various sizes and shapes that contain shelf-stable food products. Aseptic containers may include a plastic pour spout as part of the container.	• containers for apple juice, soup, soy/rice milk.
11	P11 (Paper)	**Gable-top Cartons** means cartons for both non-refrigerated items and refrigerated items. These are usually paper-based, may be any shape, and may include a plastic pour spout as part of the carton	• cartons for granola and crackers • cartons for milk, juice, and egg substitutes
12	P12 (Paper)	**Compostable Paper – Packaging** means items that are made mostly of paper that don't fit into any other material types, that are used for packaging, that are combined with other materials, or are contaminated with large amounts of wax, food, and/or moisture, and which are compostable.	• waxed corrugated cardboard • food-soiled packaging paper and moisture-soiled packaging paper • pulp paper egg cartons • unused pulp plant pots • molded paper packing materials • some berry trays • plates, cups, bowls, trays, take-out containers, etc. that are clearly not coated

Running Total	Order & Category Name	Material Type and Definition	Examples
13	P13 (Paper)	**Compostable Paper - Non-packaging** means non-packaging items made mostly of paper that don't fit into any other material types, that are combined with other materials, or are contaminated with large amounts of wax, food, and/or moisture, and which are compostable.	• waxed paper • napkins • tissue • paper towels • food-soiled paper and moisture-soiled paper • loose shredded paper • dirty molded paper plates
14	P14 (Paper)	**Remainder/Composite Paper** means items made mostly of paper but combined with large amounts of other materials. These are items that do not fit into any other categories, and are not generally compostable or recyclable.	• blueprints • sepia • "onion skin" paper • carbon paper • photographs • sheets of paper stick-on labels • butcher paper • envelopes lined with plastic or bubble wrap.
15	G1 (Glass)	**Clear Glass Bottles and Containers – CRV** means clear glass containers that display the CRV notification. Includes whole and broken bottles.	• soda bottles • fruit juice bottles • wine cooler bottles
16	G2 (Glass)	**Clear Glass Bottles and Containers - Non-CRV** means clear glass containers that do not display the CRV notification. Includes whole and broken containers.	• mayonnaise jars • jam jars • clear wine bottles
17	G3 (Glass)	**Green Glass Bottles and Containers – CRV** means green-colored glass containers that display the CRV notification. Includes whole and broken bottles.	• soda bottles • beer bottles

Running Total	Order & Category Name	Material Type and Definition	Examples
18	G4 (Glass)	**Green Glass Bottles and Containers - Non-CRV** means green-colored glass containers that do not display the CRV notification. Includes whole and broken bottles.	• green wine bottles
19	G5 (Glass)	**Brown Glass Bottles and Containers – CRV** means brown-colored glass containers that display the CRV notification. Includes whole and broken bottles.	• beer bottles
20	G6 (Glass)	**Brown Glass Bottles and Containers - Non-CRV** means brown-colored glass containers that do not display the CRV notification. Includes whole and broken bottles.	• brown wine bottles
21	G7 (Glass)	**Other Colored Glass Bottles and Containers** means other-colored glass containers, with or without the CRV notification. Includes whole and broken bottles.	• colored bottles and containers (other than clear, green and brown)

Running Total	Order & Category Name	Material Type and Definition	Examples
22	G8 (Glass)	**Remainder/Composite Glass** means glass that cannot be put in any other type. It includes flat glass and items made mostly of glass but combined with other materials.	• glass windowpanes, doors, and tabletops • safety glass • architectural glass • Pyrex and CorningWare • crystal and other glass tableware • drinking glasses • mirrors • non-fluorescent light bulbs • auto windshields • flat automotive window glass (side windows) • laminated glass • curved glass
23	M1 (Metal)	**Tin/Steel Cans** means rigid containers made mainly of steel, both CRV and non-CRV containers. 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.	• food cans and beverage containers • empty metal paint cans • empty spray paint cans and aerosol containers • bimetal containers with steel sides and aluminum ends
24	M2 (Metal)	**Major Appliances** means discarded major appliances encased in metal, of any color. These items are often enamel-coated. This type does not include electronics, such as televisions and stereos.	• washing machines • clothes dryer • hot water heater • stove • refrigerator

Running Total	Order & Category Name	Material Type and Definition	Examples
25	M3 (Metal)	**Other Ferrous** means any iron or steel that is magnetic or any stainless-steel item. This type does not include tin/steel cans.	• structural steel beams • metal clothes hangers • metal pipes • stainless steel cookware • security bars (e.g. window bars, wheel locks) • scrap ferrous items
26	M4 (Metal)	**Aluminum Cans - CRV** means any beverage container that is made mainly of aluminum and that displays the CRV notification. This subtype does not include bimetal containers with steel sides and aluminum ends.	• soda or beer cans
27	M5 (Metal)	**Aluminum Cans - Non-CRV** means any beverage container that is made mainly of aluminum and that does not display the CRV notification.	• pet food cans • meat cans
28	M6 (Metal)	**Other Non-Ferrous** means 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, zinc, or other metals.	• aluminum window frames • aluminum siding • copper wire • shell casings • brass pipes • aluminum foil

Running Total	Order & Category Name	Material Type and Definition	Examples
29	M7 (Metal)	**Remainder/Composite Metal** means 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 metals combined. Includes products whose weight is derived significantly from the metal portion of its construction.	• small non-electronic appliances (e.g. toasters, hair dryers) • used oil filters • motors • insulated wire
30	PL1 (Plastic)	**PETE Beverage Containers - CRV** means containers for beverages that are marked with PET (1) and have the CRV symbol.	• beverage containers for soda, juice, water, etc.
31	PL2 (Plastic)	**PETE Bottles and Jars – Non-CRV** means screw top bottles without the CRV symbol and jars that are marked with PET (1).	• beverage containers for soda, juice, water, etc. • jars and containers for food • containers for household products (e.g. shampoo, cleaning products)
32	PL3 (Plastic)	**PETE Containers, Lids, and other Packaging** means containers, tubs, lids, clamshells, trays, tray lids, cups, bowls, plates, cake domes, and small storage containers, that are marked PET (1) and used to package items such as fresh produce, baked good, nuts, and deli items.	• containers, tubs and lids • clamshells • trays and tray lids • cups, bowls and plates • cake domes • small storage containers
33	PL4 (Plastic)	**HDPE Beverage Containers - CRV** means containers for beverages that are marked with HDPE (2) and have the CRV symbol.	• beverage containers for soda, juice, water, etc.

Running Total	Order & Category Name	Material Type and Definition	Examples
34	PL5 (Plastic)	**HDPE Bottles and Jars - Non-CRV** means screw top bottles without the CRV symbol and jars that are marked HDPE (2).	• beverage containers for soda, juice, water • jars and containers for food • containers for household products (e.g. shampoo, cleaning products)
35	PL6 (Plastic)	**HDPE Containers, Lids, and Other Packaging** means containers, tubs, lids, clamshells, trays, tray lids, cups, bowls, plates, cake domes, small storage containers, and trays that are marked HDPE (2) that are used to package items such as fresh produce, baked good, nuts, and deli items.	• containers, tubs and lids • clamshells • trays and tray lids • cups, bowls and plates • cake domes • small storage containers
36	PL7 (Plastic)	**Polypropylene Containers and Packaging** means bottles, jars, containers, lids, and other packaging labelled with PP (5), both with and without the CRV symbol.	• storage containers • yogurt cups • sour cream tubs • syrup and ketchup bottles

Running Total	Order & Category Name	Material Type and Definition	Examples
37	PL8 (Plastic)	**Other Plastic Containers and Packaging** means bottles, jars, containers, lids, and other packaging that are made of types of plastic other than PET (1), HDPE (2), or PP (5). Items may be made of vinyl, LDPE, PVC, PS, or other plastic. They may bear the number 3, 4, 6, or 7 in the triangular recycling symbol, or may bear no recycling symbol.	• clamshells • trays and tray lids • cups, bowls and plates • hardware and fastener packaging • detergent and cleaning product bottles • squeezable bottles • frozen food containers • microwave food trays • vitamin bottles • cookie trays found in cookie packages • small (less than 1 gallon) plant containers such as nursery pots and plant six-packs • plastic strapping • string
38	PL9 (Plastic)	**Expanded Polystyrene Packaging** means packaging items made of expanded polystyrene. Does not include non-packaging items such as insulation boards.	• cups, plates and bowls • clamshells • egg cartons • foam ice chests • transport and other packaging
39	PL10 (Plastic)	**Plastic Trash Bags** means plastic bags sold for use as trash bags, for both residential and commercial use. This type does not include other plastic bags, like shopping bags, that might have been used to contain trash.	• garbage bags and can liners • compostable plastic bags • lawn and leaf bags

Running Total	Order & Category Name	Material Type and Definition	Examples
40	PL11 (Plastic)	**Plastic Grocery and Other Merchandise Bags** means plastic shopping bags used to contain merchandise to transport from the place of purchase, given out by the store with the purchase. Does not include produce bags.	• dry cleaning bags (one-time use) • grocery bags • merchandise bags
41	PL12 (Plastic)	**Non-Bag Commercial and Industrial Packaging Film** means film plastic used for large-scale packaging or transport packaging.	• shrink wrap • mattress bags • furniture wrap • film bubble wrap
42	PL13 (Plastic)	**Film Products** means plastic film used for purposes other than packaging.	• agricultural film • wrap for hay bales • plastic sheeting (e.g. drop cloths) • building wrap
43	PL14 (Plastic)	**Flexible Plastic Pouches** means plastic pouches made of thicker, multi-layer flexible material. Material is thicker than potato chip bags and frozen vegetable bags. May have a flat bottom so that package would stand up on its own, but not always. May have plastic screw tops.	• plastic coffee bags • juice pouches (e.g. Capri Sun) • baby food pouches • food pouches for soup, salad, wine, or backpacking meals • soap refill pouches • laundry detergent pouches

Running Total	Order & Category Name	Material Type and Definition	Examples
44	PL15 (Plastic)	**Other Film** means all other plastic film that does not fit into any other type, excluding flexible plastic pouches.	• sandwich bags • zipper-recloseable bags • newspaper bags • produce bags • frozen vegetable bags • bread bags • food wrappers (e.g. candy-bar wrappers • potato chip bags • mailing pouches • bank bags • X-ray film • metallized film (e.g. balloons) • plastic food wrap

Running Total	Order & Category Name	Material Type and Definition	Examples
45	PL16 (Plastic)	**Durable Plastic Items** means plastic items other than containers or film plastic that are made to last for more than one use. These items may bear the numbers 1 through 7 in the triangular recycling symbol.	• crates, totes, buckets, tubs • large storage bins that do not have sharp corners • plastic garbage cans • flower pots larger than one gallon • lawn furniture • tool boxes • first-aid boxes • plastic toys and sporting goods • CDs and cases • plastic housewares including durable plates, cups, utensils • building materials such as house siding, housing for electronics, fan blades, plastic pipes and fittings

Running Total	Order & Category Name	Material Type and Definition	Examples
46	PL17 (Plastic)	**Remainder/Composite Plastic** means plastic that cannot be put in any other type. These items are usually recognized by their optical opacity. This type includes items made mostly of plastic but combined with other materials. Does not include any plastic packaging.	• auto parts made of plastic attached to metal • some kitchenware • some toys • window blinds • plastic lumber • insulating foam • imitation ceramics • handles and knobs • Formica, vinyl, and linoleum • plastic rigid bubble/foil packaging (e.g. medication) • disposable plastic forks, knives, spoons, straws, and stirrers • expanded polystyrene items not used for packaging (e.g. insulation boards)
47	E1 (Electronics)	**Large Equipment** means large items that usually need electric currents or electromagnetic fields to operate.	• musical equipment • slot machines • large printing machines • large exercise equipment

Running Total	Order & Category Name	Material Type and Definition	Examples
48	E2 (Electronics)	**Consumer Electronics and Small Equipment** means small IT and telecommunication equipment, and other small items that usually need electric currents or electromagnetic fields to operate.	• mobile phones • GPS • calculators • printers • computers without screen • vacuum cleaners • sewing machines • microwaves and toasters • irons • electric knives • shavers • toys • some sport equipment • some hair care appliances
49	E3 (Electronics)	**Covered Video Display Devices** means video display devices with a screen greater than four inches, measured diagonally. A video display device may use, but is not limited to, a cathode ray tube (CRT), liquid crystal display (LCD), gas plasma, digital light processing or other image projection technology	• cathode ray tubes and devices containing CRTs • devices containing LCDs • plasma televisions • tablet computers (e.g. iPad)

Running Total	Order & Category Name	Material Type and Definition	Examples
50	OR1 (Organics)	**Food - Potentially Donatable - Vegetative** means uncooked or cooked fresh vegetables, fruits, and fungi that are in a whole state (i.e., not partially consumed) and are unmixed with non-vegetative food types. Items that are excluded from this category include condiments, non-perishable packaged fruits, and vegetables such as: packaged dried fruits and vegetables, packaged dried legumes/lentils, canned fruits and vegetables, and nuts. Any unpackaged vegetables, fruits, and fungi found in a whole state in residential loads are excluded from this category and should be sorted as *not donatable – non-meat*. However, unpackaged vegetables fruits, and fungi found in a whole state in commercial loads are included in this category.	• mixed fruit salad • whole apple • sliced fruits and vegetables • entire head of lettuce • unopened package of mushrooms
51	OR2 (Organics)	**Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives** means egg or dairy products and dairy alternatives that are in a whole state, unmixed with other food types, and in the original unopened package.	• milk • cheese – whole or sliced • eggs • yogurt • soy and nut yogurts • soy and nut cheeses, soy/nut/rice/coconut milks (whether shelf stable or not) • tofu

Running Total	Order & Category Name	Material Type and Definition	Examples
52	OR3 (Organics)	**Food - Potentially Donatable - Animal Meat** means any uncooked or cooked meat (beef, poultry, pork, lamb) or fish product that is in a whole state, is unmixed with other food types, and is in the original unopened package.	• whole rotisserie chicken in original unopened package • raw steak in original unopened package • raw fish in original unopened package • sliced deli meat in original unopened package • prepared meats in original unopened package (e.g. chicken nuggets, jerky, canned meat, etc.)
53	OR4 (Organics)	**Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items** means items that are in a whole state, but could have multiple food types mixed together as a part of cooking or preparation, and are still in their original unopened package.	• a whole egg sandwich in original unopened package • whole tray of lasagna • whole tray of chow mein • whole frozen pizza in original unopened package • whole baked goods such as whole loaves of breads, whole pastries • whole bag of tortillas in original unopened package • unopened perishable beverages such (e.g. fresh fruit or vegetable juice)

Running Total	Order & Category Name	Material Type and Definition	Examples
54	OR5 (Organics)	**Food - Potentially Donatable - Packaged Non-perishable** means shelf-stable foods that are in a whole state and are in the original unopened package. Items that are excluded from this category include shelf-stable meats, shelf-stable dairy products, and shelf-stable dairy alternatives	• canned and bottled foods • rice • pasta • beans • lentils • nuts and nut butters • flour • sugar • spices • oils • condiments • foods contained in aseptic or retort packages and other products that do not require refrigeration until after opening • non-perishable beverages such as sodas.
55	OR6 (Organics)	**Food - Not Donatable - Meat** means any food that is predominantly meat or fish, but the product is not in a whole state (i.e., partially consumed), or the product's packaging has been opened, or the product was not contained in any packaging at all.	• partially consumed rotisserie chicken • deli meat in opened package • unpackaged raw meats • hamburger which is mostly meat by weight • meat and fish trimmings

Running Total	Order & Category Name	Material Type and Definition	Examples
56	OR7 (Organics)	**Food - Not Donatable - Non-meat** means any food that is not predominantly meat or fish, not in a whole state, or not in its original unopened package.	• partially consumed non-meat foods • non-meat foods in a package that has been opened • non-meat foods that are not in their original packaging • half eaten burrito • partially consumed lasagna - even if the dish contains small amounts of meat • fruit and vegetable peels • skins, trimmings, and ends (e.g. potato skins, banana peel, cucumber end, etc.) • indistinguishable food
57	OR8 (Organics)	**Food - Inedible** means items typically not consumed by people in the United States. Note that small amounts of edible material associated with the inedible material are permitted to be included as "inedible." Excludes fruit and vegetable peels, skins, trimmings, and ends.	• bones • pits • shells • coffee grounds
58	OR9 (Organics)	**Leaves and Grass** means plant material, except woody material, from any public or private landscape. This type does not include woody material or material from agricultural sources.	• leaves • grass clippings • plants • seaweed

Running Total	Order & Category Name	Material Type and Definition	Examples
59	OR10 (Organics)	**Prunings and Trimmings** means woody plant material up to 4 inches in diameter from any public or private landscape. This type does not include stumps, tree trunks, branches exceeding 4 inches in diameter, or material from agricultural sources.	• prunings • shrubs • small branches with branch diameters that do not exceed 4 inches.
60	OR11 (Organics)	**Branches and Stumps** means woody plant material, branches, and stumps that exceed 4 inches in diameter, from any public or private landscape.	• branches with diameters greater than 4 inches • stumps
61	OR12 (Organics)	**Manures** means manure and soiled bedding materials from large domestic, farm, or ranch animals. Does not include feces from small household pets such as dogs and cats	• manure • soiled bedding
62	OR13 (Organics)	**Clean Dimensional Lumber** means unpainted new or demolition dimensional lumber. May contain nails or other trace contaminants	• 2 x 4s, 2 x 6s, and 2 x 12s • residual materials from framing and related construction activities
63	OR14 (Organics)	**Clean Engineered Wood** means unpainted new or demolition scrap from sheeted goods. May contain nails or other trace contaminants	• plywood • particleboard • wafer board • oriented strand board • residual materials used for sheathing and related construction uses

Running Total	Order & Category Name	Material Type and Definition	Examples
64	OR15 (Organics)	**Clean Pallets and Crates** means unpainted wood pallets, crates, and packaging made of lumber/engineered wood. May contain nails or other trace contaminants	• unpainted wood pallets • crates • packaging made of lumber/engineered wood
65	OR16 (Organics)	**Wood Waste - Treated/Painted/Stained** means wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood; and wood that has had an external coating.	• wood and wood products with paint, varnish, or other finish applied • handrails • finished furniture
66	OR17 (Organics)	**Other Recyclable Wood** means recyclable wood not included in any other category. This may include scrap from production of prefabricated wood products. May contain nails or other trace contaminants	• wood furniture or cabinets that have not been treated with paint, stain, or other chemical finish • untreated and unpainted fencing • recyclable demolition wood • untreated or unpainted wood roofing and siding
67	OR18 (Organics)	**Remainder/Composite Organic - Compostable** means organic material that cannot be put in any other type that is compostable.	• cork • hemp rope • hair • small wood products (e.g. popsicle sticks and toothpicks) • sawdust • agricultural crop residues

Running Total	Order & Category Name	Material Type and Definition	Examples
68	InOth1 (Inerts & Other)	**Concrete** means a hard material made from sand, aggregate, gravel, cement mix, and water. This category includes concrete with a steel internal structure composed of reinforcing bars (re-bar) or metal mesh.	• pieces of building foundations • concrete paving • concrete/cinder blocks
69	InOth2	**Asphalt Paving** means a black or brown, tar-like material mixed with aggregate used as a paving material	• asphalt paving
70	InOth3 (Inerts & Other)	**Asphalt Roofing** means composite shingles and other roofing material made with asphalt.	• asphalt roofing • asphalt shingles and attached roofing tar and tar paper
71	InOth4 (Inerts & Other)	**Gypsum Board** means interior wall covering made of a sheet of gypsum sandwiched between paper layers. Includes used and unused broken or whole sheets. Includes painted gypsum board.	• gypsum board • sheet rock • drywall • plasterboard • gypboard • Gyproc • wallboard
72	InOth5 (Inerts & Other)	**Carpet** means 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.	• carpet

Running Total	Order & Category Name	Material Type and Definition	Examples
73	InOth6 (Inerts & Other)	**Rock, Soil, and Fines** means rock pieces of any size and soil, dirt, and other matter. This type also includes nonhazardous contaminated soil.	• rock • stones • sand • clay • soil and other fines
74	InOth7 (Inerts & Other)	**Remainder/Composite Inerts and Other** means inerts and other material that cannot be put in any other type. This type may include items from different types combined, which would be very hard to separate. This type may also include demolition debris that is a mixture of items such as plate glass, wood, tiles, gypsum board, synthetic counter tops, fiber or composite acoustic ceiling tiles, and aluminum scrap.	• brick • ceramics • tiles • toilets • sinks • dried paint not attached to any materials • fiberglass • insulation • carpet padding • mixed demolition debris
75	HHW1 (Household Hazardous Waste)	**Paint** means containers with paint in them. This type does not include dried paint, empty paint cans, or empty aerosol containers.	• latex paint • oil-based paint • tubes of pigment • fine art paint
76	HHW2 (Household Hazardous Waste)	**Used Oil** means the same as defined in Health and Safety Code section 25250.1(a).	• spent lubricating oil (e.g. crankcase and transmission oil, gear oil, hydraulic oil)
77	HHW3 (Household Hazardous Waste)	**Lead-acid (Automotive) Batteries** means batteries consisting of lead-acid cells.	• auto batteries

Running Total	Order & Category Name	Material Type and Definition	Examples
78	HHW4 (Household Hazardous Waste)	**Other Batteries** means any type of battery other than lead-acid (automotive) batteries.	• AA, AAA, D batteries • 9-volt batteries • rechargeable batteries • watch and hearing aid batteries
79	HHW5 (Household Hazardous Waste)	**One-Pound Propane Gas Cylinders** means small, compact, and portable propane gas cylinders used to power devices such as camping stoves, tailgating grills, heaters, and more. Generally, these cylinders are not refillable.	• one-pound propane gas cylinder
80	HHW6 (Household Hazardous Waste)	**Pharmaceuticals** means both prescription and over-the-counter medications and supplements in all forms. Does not include containers for these items, except for tubes for creams and ointments and other containers that cannot be easily separated from the product they contain.	• pills • liquid medications • creams and ointments
81	HHW7 (Household Hazardous Waste)	**Remainder/Composite Household Hazardous** means household hazardous material that cannot be put in any other type. Examples include household hazardous waste that, if improperly put in the solid waste stream, may present handling problems or other hazards. Also includes vehicle and equipment fluids other than used oil.	• pesticides • caustic cleaners • sharps • fluorescent lamps • LED lamps • mercury-containing items (e.g. thermostats and thermometers) • vehicle and equipment fluids (e.g. used oil)

Running Total	Order & Category Name	Material Type and Definition	Examples
82	SW1 (Special Waste)	**Tires** means vehicle tires. Tires may be pneumatic or solid.	• automobile tires • lawn mower tires • bicycle tires • motorcycle tires • heavy equipment tires
83	SW2 (Special Waste)	**Bulky Items** means large, hard-to-handle items that are not defined elsewhere in the material types list, including furniture and other large items.	• furniture • box springs • base components for beds

Running Total	Order & Category Name	Material Type and Definition	Examples
84	SW3 (Special Waste)	**Mattresses and Foundations** means a resilient material or combination of materials that is enclosed by a ticking, is used alone or in combination with other products, and is intended for or promoted for sleeping upon. Includes foundations, which means a ticking-covered structure used to support a mattress or sleep surface. The structure may include constructed frames, foam, box springs, or other materials, used alone or in combination. Does not include any unattached mattress pad or unattached mattress topper, including items with resilient filling, with or without ticking, intended to be used with or on top of a mattress; a sleeping bag or pillow; a car bed, crib, or bassinet mattress; juvenile products, including a carriage, basket, dressing table, stroller, playpen, infant carrier, lounge pad, or crib bumper, and the pads for those juvenile products; a product containing liquid- and gaseous-filled ticking, including a water bed and air mattress that does not contain upholstery material between the ticking and the mattress core; upholstered furniture that does not otherwise contain a detachable mattress or that is a fold out sofa bed or futon.	• mattresses • structures used to support mattress

Running Total	Order & Category Name	Material Type and Definition	Examples
85	SW4 (Special Waste)	**Remainder/Composite Special Waste** means special waste that cannot be put in any other type. Includes treated medical waste (medical waste that has been processed in order to change its physical, chemical, or biological character or composition, or to remove or reduce its harmful properties or characteristics, as defined in Section 25123.5 of the Health and Safety Code).	• ash • auto fluff • auto bodies • treated medical waste • untreated medical waste (e.g. tubes, oxygen masks) • asbestos-containing materials (e.g. certain pipes, insulation, and floor tiles) • artificial fireplace logs
86	MISC1 (Miscellaneous)	**Textiles – Organic** means 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	• cloth and rags • clothing • towels • sheets • rope
87	MISC2 (Miscellaneous)	**Textiles – Synthetic, Mixed, Unknown** means cloth, clothing, sheets and towels, other textile items, and rope made of unknown fibers, synthetic fibers or made from a mixture of synthetic and natural materials	• cloth and rags • clothing • towels • sheets • rope
88	MISC3 (Miscellaneous)	**Textiles - Shoes, Purses Belts** means all shoes and boots, purses, and belts whether made of leather, rubber, other materials, or a combination thereof	• shoes and sandals • purses • belts

Running Total	Order & Category Name	Material Type and Definition	Examples
89	MISC4 (Miscellaneous)	**Solar Panels** means panels used to convert sunlight into electricity. Solar panels consist of a semiconductor material such as silicon, encased in glass, with an aluminum frame. This category is specific to the panels, themselves, and does not include associated equipment such as junction boxes, wires, inverters, cables, energy storage batteries, or a photovoltaic cell that is part of a consumer electronic device for which it provides electricity needed to make the device function.	• solar panels
90	MISC5 (Miscellaneous)	**Diapers & Sanitary Products** means single-use items that are made from a combination of natural and/or synthetic fibers.	• diapers • feminine hygiene products • adult protective undergarments • absorbent pads
91	MISC6 (Miscellaneous)	**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.	• garden hoses • cigarette butts • cosmetics • straw baskets • non-textile leather items • rubber sports balls • dryer and Swiffer sheets • animal carcasses

Running Total	Order & Category Name	Material Type and Definition	Examples
92	MISC7 (Miscellaneous)	**Mixed Residue** means material that cannot be put in any other type or category. This category includes mixed residue and materials smaller than two inches that cannot be further sorted. Includes materials that cannot be put in any other material type or the various remainder/composite types described for each broad material type (paper, plastic, etc.).	• clumping kitty litter • feces from household pets • partially filled containers of non-food consumer products
93	MISC8 (Miscellaneous)	**MRF Residual Fines** means material of small size (less than 2 inches in diameter) that are residual material from a material recovery facility (MRF) or other sorting process, that are ultimately sent to landfills for disposal	• processing residual fines
94	MISC9 (Miscellaneous)	**Miscellaneous Inorganics** means inorganic items that cannot be put in any other type.	• kitchen ceramics • synthetic rubber products (e.g. kitchen gloves)

Appendix C: Forms Used in the Study

Examples forms include:

- Solid Waste Facility Recruitment Script
- Solid Waste Facility Recruitment Form
- Multi-family Facility Recruitment Form & Script
- MRF Recruitment Script
- MRF Facility Recruitment Form
- MRF Data Collection Plan
- Vehicle Survey Form
- Vehicle Selection Form
- Multi-family Site Visit Form

Solid Waste Facility Recruitment Script (Page 1)

2018 Waste Characterization Study – Disposal Facility Study

Recruitment Script

Hello, my name is _____ and I am calling from CalRecycle regarding the statewide waste characterization study we're carrying out this year.

Could I please speak to the operations or facility manager about helping us out with this study?

[Once the correct person is on the phone]

The reason I am calling you today is that CalRecycle is beginning the 2018 Waste Characterization Study and we have selected your facility as a desired sampling site. The goal of the study is to capture what materials are landfilled in California. The data we collect from your facility over 1-2 days will be aggregated with about 35 other sample sites so it will be anonymous, but we would happily give you the survey results for your facility. Can you participate in this year's study?

[If we have sampled at this facility previously, mention that this will be very similar to the work we did in _____]

Does the facility accept regular trash, including food waste, for disposal?

☐ Yes ☐ No

If not, ask what they take in the door and whether they process it, like C&D waste. If they process material, ask if we could contact them later to take part in a different study and get contact information.

If yes:

Based on the information I have about your facility, you receive waste coming in by direct haul, that is, not in transfer trucks, from _____County, and it's about _____ tons per year.

Is that correct?

☐ Yes ☐ No

If not, can you tell me what the correct information is?

If the site looks viable, continue.

Solid Waste Facility Recruitment Script (Page 2)

I have a few brief questions to make sure we can use your facility as a sampling site:

1. We plan to collect samples from packer trucks, roll-off boxes, and self-haul vehicles so we capture both residential and commercial waste streams. We aim to collect 24 samples total. So:

- Does your facility receive five or more residential packer trucks per day?
- Does your facility 7 or more commercial loads per day, from either packer trucks, compactors, or roll-offs that carry waste from businesses?
- Does your facility receive 12 or more loads per day from self-haulers?

2. Does your facility have a place we can collect and sort these samples?

Also, some self-haul loads need to be dumped so that the field crew and visually observe the contents, so a space will be needed for that also. Is that okay? We would then dispose of samples into the active face.

3. We would like the assistance of a loader and loader-driver throughout the day (but not continuously) to pick up samples out of selected loads and move them to the sort area. **Is this possible?**

4. Is a toilet available the crew can use?

5. Before the sampling, we would like to send 1-2 staff to survey gate traffic so we have a better idea of the site layout and the flow of material coming into the facility (how often residential direct haul trucks come in, etc.). We would station them in the gatehouse with your attendant and they would ask the truck drivers a couple short questions – source sector, construction material, etc. - and then get the vehicle weight from your attendant. **Would this be ok to do?**

Solid Waste Facility Recruitment Form (Page 1)

Facility Data Sheet— 2018 Disposal Characterization Study

Name of site:
SWIS #:
Source County of Interest:
Recruiter:

1. SCHEDULE

The field work for the project will take place in August, and we would like to send two staff to survey traffic coming in the gate for one day in July, to plan for the sampling day.

Are there any dates that definitely will not work?

☐ No ☐ Yes – list them

2. TONNAGE & VEHICLE QUANTITIES

Note to recruiter: add this information in from the recruitment script later.

Based on the information I have about your facility, you receive waste coming in by direct haul, that is, not in transfer trucks, from _____County, and it's about _____ tons per year.
Is that correct?

☐ *Yes* ☐ *No*

If not, can you tell me what the correct information is?

How many vehicles carrying trash **from this county** enter on a weekday, on average, from the following sources? (We can fax or e-mail the definitions of waste sectors to the data contact person at the facility if they are unclear.) *Note: may need to talk to someone else (like a scalehouse person) to get this info – if so, get that person's contact info.*

		Weekday Vehicle Counts	Saturday Vehicle Counts	Sunday Vehicle Counts
Residential route trucks				
Haulers with nonresidential waste (trucks carrying commercial, industrial, government, military, or multifamily waste)	Roll-offs			
	Packers or compactors			
Self-haul vehicles				
Total Vehicle Count				

Solid Waste Facility Recruitment Form (Page 2)

Peak times of day on a weekday?

For haulers with residential waste:
For haulers with nonresidential waste:
For haulers with C&D waste:
For self-haul vehicles, including contractors and landscapers:

Are there any days during which you do not receive waste from one of these types of loads?

**Can we have one weekday's transaction records (if yes, provide them your fax or email)?

3. **Processing**

Are any loads processed to remove materials before they are (landfilled/put in the hole) disposed/sent for disposal?

☐ Yes ☐ No

If yes, I need to ask you some questions about the processing.

The goal of the study is to capture samples of materials that will be disposed. For example, we don't want to sample from loads before they are processed, because then we'd be including materials that will be diverted in our sorts. So I need to know a little bit about your operations.

a. **Residential** – do the residential packer loads go straight to disposal/transfer without any processing?

☐ Yes ☐ No

If they are processed, can you please describe how it is done, and where the residuals accumulate?

Is it possible to capture samples of pure residential waste meant for disposal (i.e., residuals or unprocessed material) from the county? How?

Are loads from different cities treated differently – some processed, some not, for example? If so, please explain.

b. **Commercial** – do the commercial **packer and compactor** (closed drop box) loads go straight to disposal/transfer without any processing?

Solid Waste Facility Recruitment Form (Page 3)

☐ Yes ☐ No

If they are processed, can you please describe how it is done, and where the residuals accumulate?

Is it possible to capture samples of pure commercial waste meant for disposal (i.e., residuals or unprocessed material) from the county? How?

Are loads from different cities treated differently – some processed, some not, for example?

c. **Commercial loose drop boxes** – do these loads go straight to disposal/transfer without any processing?

☐ Yes ☐ No

If they are processed, can you please describe how it is done, and here the residuals accumulate?

Are loads from different cities treated differently – some processed, some not, for example?

Is it possible to capture samples of pure commercial drop box waste meant for disposal from the county? How?

d. **Self-haul (public) waste** – do do these loads go straight to disposal/transfer without any processing?

☐ Yes ☐ No

If they are processed, can you please describe how it is done, and here the residuals accumulate?

Solid Waste Facility Recruitment Form (Page 4)

Are loads from different cities treated differently – some processed, some not, for example?

Is it possible to capture samples of pure self-haul waste meant for disposal from the county? How?

Note: If processing occurs on-site, fill out the last page also, probably at the end of the call.

4. SITE INFORMATION

Facility's hours of operation:

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

Do you accept vehicles before opening the gate to the public?

If so, what types of vehicles and what time do they arrive?

How many entrances for trash loads does your facility have? _____
How many inbound scales for trash loads at each entrance? Staffed_____ Automated_____
How many outbound scales for trash loads at each entrance? Staffed_____ Automated_____

Do different types of vehicles go to different gatehouses or scales– i.e., all self-haul going to one scale? If yes, please explain.

Do you close early if you have reached your allowed daily tonnage amount? Yes No

Estimate how many times per month this happens. _____/month

Should we be aware of any special projects or occasions that would result in a change in quantity or type of material entering the facility (large local construction projects, upcoming flow control changes, etc.)?

Solid Waste Facility Recruitment Form (Page 5)

Are there site conditions we need to be aware of such as high winds, snakes or other animals, or other special circumstances?

Would it be possible for the sorting crew to be there when the site is closed, for example after hours or on weekends if needed?

5. NET WEIGHT PROCEDURES

Do all vehicles get weighed? If not, which types of vehicles don't get weighed? Please explain how you collect net weight information for vehicles.

We will be sending surveyors to gather data on incoming loads for one day in July. Drivers of loads will be surveyed at the entrance throughout the day. The survey is very brief, involving just a few questions. We also will need to collect the net weight of each vehicle that we survey. We may give the driver of each inbound vehicle a numbered card to hand to your gatehouse staff when the vehicle exits the facility. Can your gatehouse staff write the net weight of each vehicle on the card?

SAMPLING AND SORTING PROCEDURES

We need an area for the sorting crew to work in for the entire time we will be at the site. It should be about the size of two truck bays, or a 20 X 40 space. Can the site accommodate this? Where do you think that will be?

Is this space covered or will it be open to the elements?

If open to the elements (a landfill), could you create a make-shift "pad" for us to work on in the case of rain? Gravel, mulch, or a substrate that would make for a safter work surface?

Is there a restroom close to the worksite?

Crews have hardhats, safety vests, coveralls, boots, and gloves. Are there any other safety equipment or special procedures you want them to use?

We need access to the load for enough time to collect the sample. After a load is tipped on the ground, the sorting crew will designate which part of the load should be picked up by the loader

Solid Waste Facility Recruitment Form (Page 6)

and moved to the sorting area. We expect that it will take from two to five minutes to obtain a sample. Is this okay?

Can we leaved sorting supplies and covered samples overnight if necessary?

6. ADDITIONAL INFORMATION

What hauling companies do you work with primarily? Could you provide us a list with contacts either below or via email?

Company:
Contact person:
Phone:
Mailing address:

Company:
Contact person:
Phone:
Mailing address:

Company:
Contact person:
Phone:
Mailing address:

In order to communicate with all drivers, we will develop translation cards that show the survey questions in several languages. What are the most common languages used by the drivers of vehicles that arrive at your facility?

___English
___Spanish
___Other: _____

7. FACILITY CONTACT INFORMATION
Please mark the best way of contacting each person—phone, email, text, etc.

Physical address:
City, Zip:
Site owner/operator (company name or public agency name):
Person approving use of the site:
Mailing address:
City, Zip:
Phone: Email:
Best way to contact (mark one): ☐ e-mail ☐ phone ☐ text

Person with data about the site (if different):
Phone: Email:

Solid Waste Facility Recruitment Form (Page 7)

Fax:
Best way to contact (mark one): ☐ e-mail ☐ phone ☐ text

On-site manager or supervisor (primary contact for logistics):	
Phone:	Email:
Will this person be available for the indicated sampling period?	
Best way to contact (mark one): ☐ e-mail ☐ phone ☐ text	

Contact person for crew when they arrive the morning of sampling:	
Phone:	Email:
Best way to contact (mark one): ☐ e-mail ☐ phone ☐ text	

Backup contact:	
Phone:	Email:
Best way to contact (mark one): ☐ e-mail ☐ phone ☐ text	

Scalehouse contact:	
Phone:	Email:
Best way to contact (mark one): ☐ e-mail ☐ phone ☐ text	

Health and Safety Manager (if applicable)	
Phone:	Email:
Best way to contact (mark one): ☐ e-mail ☐ phone ☐ text	

Risk Management Contact (where should we send our proof of insurance?)	
Phone:	Email:
Best way to contact (mark one): ☐ e-mail ☐ phone ☐ text	

Other Contact information notes:

8. FINAL LOGISTICS

Can you please send me a plan or map of the area where you think you might set us up for sampling? (taken from permit)

Any other special circumstances we need to be aware of?

We will send you a copy of our insurance policy. Is there anything else you need from us?

Solid Waste Facility Recruitment Form (Page 8)

Please remember to notify gate personnel of the dates we will be visiting your facility.

Cal Recycle may wish to set up site visits during sorting for staff to observe fieldwork for the project. Is this okay?

We will provide a one month and a one week reminder of our visit. We will use these reminders to finalize and verify sampling and sorting logistics and dates. Would you like any other reminders?

If we have further questions, someone from the project team (CalRecycle, Cascadia Consulting Group, or MSW Consultants) will contact you.

Recruiter re-cap, after you complete the FDS form

Sectors that can be sampled here:

☐ Residential ☐ Commercial ☐ Self-Haul

Special Circumstances:

Follow up needed:

Any other comments:

Additional information on MRFs at the site – you may have already gotten some of this data during your conversation with the site, but you may need to ask additional questions to get complete data for this.

Is there a facility/line at the site that processes clean recyclables?

☐ Yes ☐ No

8

Solid Waste Facility Recruitment Form (Page 9)

If yes, what is the source of materials:

Residential curbside (blue bin) recycling

Commercial (clean) recycling

Are these processed on the same line?

At the same time?

Is there a facility/line at the site that processes mixed waste or dry commercial loads?

☐ Yes ☐ No

If yes, what is the source of materials:

Residential curbside (black bin) trash

Commercial dry route loads

General commercial mixed waste

We are also doing a study on MRF residuals. Would you be open to being part of that study also?

☐ Yes ☐ No

If yes, we'd like to contact you later to discuss that part of the study.

Multi-family Recruitment Form & Script (Page 1)

CalRecycle 2018 Waste Characterization Study - Apartment Recruitment Form

Notes	

Apartment Name	
Apartment Phone Number	
Apartment Address	
Region	
County	

Sort Site	
Scheduled date at sort site	

Recruiter	
Recruitment date and time	

Hello, this is (your name) with CalRecycle, the state agency that deals with waste and recycling in California. May I please speak with the apartment manager?

Hello, this is (your name) with CalRecycle, the state agency that deals with waste and recycling in California. We are conducting a major statewide survey of the disposed waste stream. In addition to sampling single family residential and commercial waste at the (local disposal facility), we also need to sample waste from multi-family complexes. Your complex was randomly chosen from all of the complexes in your area to participate in this important study. Your participation involves nothing more than allowing us to take a sample of your trash. We do this in order to get a better idea of what types of materials are still going to landfills. We then use this information to determine what markets we need to create or expand so as to increase the recycling and reuse of discarded materials, so that we can conserve resources and make our landfills last longer.

1. Would you be willing to allow us to take a small sample of your trash for our study?	☐Yes ☐No

Multi-family Recruitment Form & Script (Page 2)

ELIGIBILITY CHECK

1. Does anyone other than your residents use your dumpsters? Is illegal dumping a big problem?	☐Yes ☐No ☐Don't know
2. Is your trash compacted?	☐Yes ☐No
3. Are different dumpsters emptied on different days?	☐Yes ☐No
4. What day(s) of the week does your waste service pick your trash?	
5. At approximately what time do they pick up the trash on that day/those days?	Mornings
6. Do you think there will be 200 pounds of trash on (_____)?	☐Yes ☐No ☐Don't know
7. What company picks up your garbage?	

8. How many units are in your complex?	
9. What portion of the units are occupied?	

10. Are your dumpsters accessible during non-business hours?	☐Yes ☐No ☐Don't know
11. Are there any times when your dumpsters are not accessible?	☐Yes ☐No ☐Don't know
12. What are those times?	
13. Are there any barriers that we will encounter when we visit?	☐Yes ☐No ☐Don't know
14. What are those barriers?	☐Dogs ☐Guards ☐Gates ☐Locks ☐Other Other (explain):
15. How can the study team gain access to the dumpsters?	

Multi-family Recruitment Form & Script (Page 3)

16. How many dumpsters do you have?	
17. How large are your dumpsters?	

18. Is there someone else that we need to talk to in order to get permission to do this?	☐Yes ☐No
If yes…	
1. What is their full name?	
2. What is their title?	
3. What is their phone number?	
4. What is their e-mail address?	
5. What are the best days to reach them?	
6. What are the best times to reach them?	
If no…	
7. What is your full name?	
8. What is your title?	
9. What is your phone number?	
10. What is your e-mail address?	
11. What are the best days to reach you?	
12. What are the best times to reach you?	
13. Do you have an after-hours phone number we can reach you on?	
14. What is your after-hours phone number?	

15. I have the following as your street address: () - is that correct?	

16. Would you like us to share the results of what's in the sample we collect with you?	
17. Do you have any questions for me?	

I will be sending you an e-mail summarizing what we just discussed.

Within the next couple of weeks, you will be hearing from one of our contractors who will be setting up the actual sample collection. You may here from the main contractor, Cascadia Consulting, or their sub-contractor, MSW Consulting.

Thank you very much for agreeing to participate in this important study.

MRF Recruitment Script (Page 1)

MRF Recruitment Screening Script – Final 1-2-19

2018 Waste Characterization Study – MRF Residuals Study

Recruitment Script

Hello, my name is _____ and I am calling from CalRecycle regarding the statewide waste characterization study we're carrying out this year.

Could I please speak to the operations or facility manager about helping us out with this study?

[Once the correct person is on the phone]

The reason I am calling you today is that CalRecycle is conduction a statewide Waste Characterization Study, including processing sites such as MRFs, and we have selected your facility as a desired sampling site. The goal of the study is to capture what materials are landfilled in California, including residuals from processing. The data we collect from your facility will be aggregated with other sample sites so it will be anonymous, but we would happily give you the survey results for your facility. Can you participate in this year's study?

I need some basic information on the processing you do to see how the site fits into our study.

1. Do you consider your facility a MRF or Recycling Center (clean MRF), a transfer facility, or both?
   ☐ MRF ☐ Transfer ☐ Both

2. What types of sorting or processing occurs at your site? According to our records, it includes (CalRecycle staff will fill in boxes below as much as possible before recruiting) is this correct?
   ☐ Clean source-separated recyclables
      ☐ Residential routes ☐ Commercial routes ☐ Drop-off/Buyback ☐ Other
   ☐ Mixed waste loads
      ☐ Residential routes ☐ Commercial routes ☐ Self-haul ☐ Other
   ☐ C&D loads
      ☐ Commercial sources ☐ Self-haul ☐ Other
   ☐ Organics
      ☐ Residential routes ☐ Commercial routes ☐ Self-haul ☐ Other

Are any of these different streams combined together before or during sorting?

Note: Get enough info to answer 1) what kinds of loads do you accept for processing and 2) what type of processing lines do you have and where does each type of load go?

Do you do any other sorting?

Do you handle food waste separately? If so, how?

Notes:

1

MRF Recruitment Script (Page 2)

3. For the study we need to capture samples of materials destined for disposal that are removed during and after sorting, such as problem materials removed before sorting, overs, unders, residuals, floor sweepings, etc. for each type of processing. Is this possible?
   ☐Yes ☐No

4. We need to make sure enough material for disposal is available for sampling for each type of processing. Approximately how much is disposed from each line, in tons per day (estimates are okay)? Is it at least 1 ton per day for each line?

Process/Sorting Line	Approx. TPD of Residuals
Clean source-separated recyclables	
Mixed waste loads	
C&D loads	
Organics	

5. Does your facility have a place we can collect and sort these samples?
   ☐Yes ☐No

6. We need to get information on the amount of residuals from each type of sorting line. Is this possible at your site?

   a. If not (say, residuals from each line are mixed, and/or are mixed with transfer material), is it possible to estimate amounts of sorting residuals from each type of line?

7. We will need your help collecting samples from each of the places residuals aggregate. This process will occur several times throughout the day but not continuously. Is this possible?

8. Is a toilet available the crew can use?

9. Before the sampling, we would like to send 1-2 staff from our contractor to meet with operations staff to review process flow, ejection points, and sampling logistics, so an efficient sampling plan for your site can be developed. Soon after that a sampling crew will be on site for 2 days to perform the sampling. We anticipate this to happen in January or February. Is this okay?
   ☐Yes ☐No

10. What county(ies) do you primarily receive materials from for sorting?

It looks like your site is an excellent site for our study. If you can participate, I have a few more detailed questions on operations and waste flows and amounts.

MRF Recruitment Form (Page 1)

	Facility Data Sheet— 2018-19 MRF Residuals Study

Name of Site:	
Line(s) to be Sampled:	
SWIS # (if any): DOR # (if any):	
Primary Site Contact/ phone/e-mail:	
Region:	☐ Bay Area ☐ Southern
Recruiter/phone:	

SWIS link:
Facility website:

Carryover from screening questions:

1. What types of sorting or processing occurs at your site? According to our records, it includes (CalRecycle staff will fill in boxes below as much as possible before recruiting)…is this correct?

   ☐Clean source-separated recyclables
   ☐ Residential routes ☐ Commercial routes ☐ Drop-off/Buyback ☐ Other

   ☐Mixed waste loads
   ☐ Residential routes ☐ Commercial routes ☐ Self-haul ☐ Other

   ☐C&D loads
   ☐ Commercial sources ☐ Self-haul ☐ Other

   ☐Organics
   ☐ Residential routes ☐ Commercial routes ☐ Self-haul ☐ Other

   Are any of these different streams combined together before or during sorting?

   Do you do any other sorting?

   Do you handle food waste separately? If so, how?

   Notes:

2. We will need your help collecting samples from each of the places residuals aggregate. This process will occur several times throughout the day but not continuously. Is this possible?
   ☐ Yes ☐ No

3. We need to get information on the amount of residuals from each type of sorting line. Is this possible at your site?

MRF Recruitment Form (Page 2)

1. **SCHEDULE**

The field work for the project will take place sometime during the period of February-March.

Are there any dates that definitely will not work?
☐ No ☐ Yes – list them

2. **VEHICLE TRAFFIC INFORMATION:**

What are the peak times of day on a weekday for loads to be sorted for each line?

Clean source-separated recyclables
Mixed waste loads
C&D loads
Organics

Are there any days during which you do not receive waste from any of these types of loads?

Facility's hours of operation:

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

Do you accept vehicles before opening the gates to the public?

If so, what types of vehicles and what time do they arrive?

How many entrances for loads does your facility have? _____
How many inbound scales for at each entrance? Staffed_____ Automated_____
How many outbound scales at each entrance? Staffed_____ Automated_____

Do all vehicles get weighed? If not, which types of vehicles don't get weighed? Please explain how you collect net weight information for vehicles.

Do different types of vehicles go to different gatehouses or scales– i.e., all self-haul going to one scale? If yes, please explain.

Do you close early if you have reached your allowed daily tonnage amount? ☐ Yes ☐ No

2

MRF Recruitment Form (Page 3)

Estimate how many times per month this happens. _____/month

Are you co-located with another facility such as a transfer station, landfill, or other facility?
☐ No ☐ Yes – please describe:

3. GATE SURVEY

For the gate survey, we need to ask vehicle drivers a few questions and collect the net weight of each vehicle that we survey. We may give the driver of each inbound vehicle a numbered card to hand to your gatehouse staff when the vehicle exits the facility. Can your gatehouse staff write the net weight of each vehicle on the card?

☐ Yes ☐ No

Are there any dates/days that will not work for the survey?

4. SAMPLING LOGISTICS

We need an area for the sorting crew to work in for the entire time we will be at the site. It should be about the size of two truck bays, or a 20 X 40 space. Can the site accommodate this? Where do you think that will be?

Is this space covered or will it be open to the elements?

Covered: ☐ Yes ☐ No

Is there a restroom close to the worksite that our crew can use?

☐ Yes ☐ No

Are there special site conditions or circumstances we need to be aware of?

☐ Yes ☐ No

Crews have hardhats, safety vests, coveralls, boots, and gloves. Are there any other safety equipment or special procedures you want them to use?
☐ Yes ☐ No

Would it be possible for the sorting crew to be there when the site is closed, for example after hours or on weekends if needed?
☐ Yes ☐ No

Can we leaved sorting supplies and covered samples overnight if necessary?

MRF Recruitment Form (Page 4)

☐ Yes ☐ No

Should we be aware of any special projects or occasions that would result in a change in quantity or type of material entering the facility (large local construction projects, upcoming flow control changes, etc.)?

☐ Yes ☐ No

5. ADDITIONAL INFORMATION

We wish to notify your customers of the study activities at your site. What hauling companies do you work with primarily? Could you provide us a list with contacts either below or via email?

Company:
Contact person:
Phone:
Mailing address:
E-mail:

Company:
Contact person:
Phone:
Mailing address:
E-mail:

In order to communicate with all drivers, we will develop translation cards that show the survey questions in several languages. What are the most common languages used by the drivers of vehicles that arrive at your facility?

___English
___Spanish
___Other: _____

**Can we have one weekday's transaction records?

☐ Yes ☐ No

6. FACILITY CONTACT INFORMATION

Please mark the best way of contacting each person—phone, email, text, etc in checkbox next to the options.

Physical address:	
City:	Zip:
Site owner/operator (company name or public agency name):	
Person approving use of the site:	
Mailing address:	
City:	Zip:
☐ Phone:	☐ Email:

4

MRF Recruitment Form (Page 5)

Person with data about the site (if different):	
☐ Phone:	☐ Email:

On-site manager or supervisor (primary contact for logistics):	
☐ Phone:	☐ Email:
Will this person be available for the indicated sampling period?	

Contact person for crew when they arrive the morning of sampling:	
☐ Phone:	☐ Email:
Backup contact:	
☐ Phone:	☐ Email:

Scalehouse contact:	
☐ Phone:	☐ Email:

Health and Safety Manager (if applicable)	
☐ Phone:	☐ Email:

Risk Management Contact (where should we send our proof of insurance?)	
☐ Phone:	☐ Email:

Other Contact information notes:

7. FINAL LOGISTICS

Can you please send me a plan or map of the area where you think you might set us up for sampling?
☐ Yes ☐ No

We will send you a copy of our insurance policy. Is there anything else you need from us?
☐ Yes ☐ No

Cal Recycle may wish to set up site visits during sorting for staff to observe fieldwork for the project. Is this okay?
☐ Yes ☐ No

We will provide a one month and a one week reminder of our visit. We will use these reminders to finalize and verify sampling and sorting logistics and dates. Would you like any other reminders?
☐ Yes ☐ No

Any other special circumstances we need to be aware of?
☐ Yes ☐ No

Please remember to notify gate personnel of the dates we will be visiting your facility.

5

MRF Recruitment Form (Page 6)

Please send:
- One day transaction record (send example?)
- Hauler contacts with phone, e-mail
- Map

9. RECAP FROM SAMPLING SCRIPT – Facility has confirmed all items:

1. Sorting occurs for the streams listed on page 1, and enough residuals are produced to accommodate sampling.
   ☐ Yes ☐ No

2. Facility has a place we can collect and sort these samples, and then dispose of them.
   ☐ Yes ☐ No

4. We will need your help collecting samples from each of the places residuals aggregate. This process will occur several times throughout the day but not continuously. Is this possible?
   ☐ Yes ☐ No

5. Before the sampling, we would like to send 1-2 staff from our contractor to meet with operations staff to review process flow, ejection points, and sampling logistics, so an efficient sampling plan for your site can be developed. Soon after that a sampling crew will be on site for 2 days to perform the sampling. We anticipate this to happen in January or February. Is this okay?
   ☐ Yes ☐ No

If we have further questions, someone from the project team (CalRecycle, Cascadia Consulting Group, or MSW Consultants) will contact you.

Recruiter re-cap – for CalRecycle Staff use only:

Lines that can be sampled here:

☐ Clean source-separated recyclables
☐ Mixed waste loads
☐ C&D loads
☐ Organics

Special Circumstances:

Follow up needed:

Any other comments:

Main counties of origin for feedstock:

6

MRF Data Collection Plan (Page 1)

CALRECYCLE MRF RESIDUAL STUDY

DATA COLLECTION PLAN

Facility:
Site Visit:
Stream:
Contact:
Confirmed Sort Date:

Processing Overview:

(example text)

- Facility outputs approximately X tons per day of residuals with an estimated X percent residual rate.
- Residuals are comprised of:

The facility processes X days per week and will accumulate residuals on the day(s) prior to the audit, as well as on the day of the audit. We expect X days of processing will result in X tons, or X pounds, of residuals. The table below estimates the breakdown in the quantity of residuals to be generated for use in sampling based on the contribution of each residue source to the facility's outbound residuals.

Residue Source Summary & Estimated Residue Generation

Residue Sources	Description	Estimated Contribution to Total Residue (% and/or tons)
1		
2		
3		
	Total	

Residue Audit Plan:

Facility Support:

Proposed Work Area:

MSW Consultants Responsibilities:

MRF Data Collection Plan (Page 2)

- A minimum of 18, 125 pound, samples are targeted among the entire processing line. Pre-sort bulky item samples may be increased to 200 lbs at the discretion of the sampler.
- Approximately, 2,300 pounds of material should be collected for sorting from the various ejection points, facility-wide. There are three residual sources along the processing line, including the pre-sorts. Sample distribution will be based on the estimates in the table above.
- During processing, [redacted] staff will deliver samples from the residual ejection points in 6 yd containers and/or an open top container to be tipped adjacent to the sort area.
- Facility personnel and equipment will spend the morning of the first day helping to subdivide the targeted material into samples.

Facility Support

- Clear out the [redacted] line tip floor and residue bunkers over the weekend in anticipation of the Monday run test
- Pre-weigh and run approximately [redacted] of mixed waste ([redacted] of single family and [redacted] of multi-family), and provide the actual weight of the material
- Accumulate residuals separately from the three ejection points and deliver all residuals to the work area
- Assist with subdividing the accumulated residues into representative samples at the direction of the MSW Consultants field supervisor
- Remove remaining (unsampled) residuals
- Provide a disposal container or area for placement and removal of sorted materials
- Provide a safety briefing Monday morning for the sort team.
- Allow restroom access
- Cars will be parked on the street
- Allow the cargo van to be parked adjacent to the work area for easy access to supplies

Proposed Work Area

- The area across from the [redacted] under the awning, as well as the adjacent uncovered concrete pad which will likely be used for sample storage
- Need approximately a 20'x20' square for the sort team, plus additional space for queuing samples (see attached schematic for location)

MSW Consultants Responsibilities

- Provide a copy of our Certificate of Insurance and keep a copy available during field work
- Provide all sort equipment, including table, bins, scales, tools, tent (if needed)
- Provide all PPE including earplugs
- Provide two professional staff to manage the performance of the audit at all times
- Provide and directly oversee a team of sorters for the analysis of process residue

MRF Data Collection Plan (Page 3)

DATA COLLECTION PLAN

[redacted]

Page 3 of 3

- Provide all raw data to facility in spreadsheet format
- Obtain permission from facility to report any facility-specific audit results for inclusion in the final report for this CalRecycle-sponsored engagement. It should be understood that the data collected from the facility may be aggregated with other MRF data for reporting purposes and the facility name will never be published and only released to requestors by CalRecycle with permission from the facility.

Vehicle Survey Form (front)

California Statewide Waste Characterization Study
Vehicle Survey Form

Date ___/___/___ **Page** ____ **of** ____

Survey Site ______________________ **Surveyor** ______________________

Minimum weight at this site ____________ **This sheet started at** ___________ **am pm** **Checked by** ______________________

All Vehicles											***Sample Number***	***% Recycled***	***Surveyor's Notes***
ID	Hauler Type	Vehicle Type	Jurisdiction	Material Hauled	Generator				From Construction Site?	Net Weight of Load			If needed for net weights, record license/ticket #s here.
	C - Commercial Hauler M - Municipal Sanitation CN - Contractor R - Res./Home Owner J - Junk Removal Hauler O - Other private/ Government Entity	1. Packer 2. DB, Loose 3. DB, Cmpctd 4. Pick-up, Van, SUV, Bx Truck 5. Car 6. Semi Truck	Please list the city of origin that the waste came from	R - Refuse C&D - Construction and Demolition L - Landscaping *Circle only one*	SF - Single-family Residential MF - Multifamily COM - Commercial MRF - MRF Residue *Must Equal 100%*				If no → No = Not from Const. If yes → N=new construction, R=remodel, D=demolition, RF=roofing, OC=other c&d	Circle units if they aren't all the same Default units (circle one) tons lbs yds			Enter hauler name if space permits.
	Choose One	*Choose One*			% SF	% MF	%COM	%MRF	*Select One Only*				
				R C&D L					No N R D RF OC	tons lbs yds			
				R C&D L					No N R D RF OC	tons lbs yds			
				R C&D L					No N R D RF OC	tons lbs yds			
				R C&D L					No N R D RF OC	tons lbs yds			
				R C&D L					No N R D RF OC	tons lbs yds			
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				R C&D L					No N R D RF OC	tons lbs yds			
				R C&D L					No N R D RF OC	tons lbs yds			

Vehicle Survey Form (back)

GENERAL INSTRUCTIONS

Enter the information at the top of each page. Enter total # of pages on each page at the end of the day.
Enter the net weight of the load. If the operator measures self-haul loads by volume, record the volume and indicate that the unit is "yds".
If the load is from a construction site, circle only one of the activities in the From Construction Site? column.
If load is not from a construction site ask if it's Landscaping.
If it's a commercial hauler ask if load is MRF residuals.
If you make an error on an entry, draw a line through the entire entry and start over on a new line

CHECK IN WITH GATEHOUSE STAFF

Confirm the method for getting net weights.

AS THE VEHICLE ARRIVES RECORD THE TYPE OF VEHICLE ON THE SURVEY SHEET

HAULER TYPE

C - Commercial Hauler	Haulers contracted by a City/County/Municipal gov't to haul from residents, businesses, and institutions. May be hauling MSW, C&D, or bulky waste.
M - Municipal Sanitation	City/County/Municipal gov't that hauls residential, business, and institutional waste. May be hauling MSW, C&D, or bulky waste. For example, the city of San Diego.
CN - Contractor	Private business, agencies, or institutions hauling waste they generate in the course of their operations. This includes garbage, C&D, bulky, or landscaping. Examples are Joe's Roofing and Goodwill hauling their own garbage.
R - Residential/Home Owners	Individuals and home owners hauling their own household trash and clean up. Can be bagged or loose trash, C&D, bulky, or yard waste. May be from multifamily but usually single family
J - Junk Removal	On call haulers of trash and bulky waste from residential or business locations. An example is "1-800 Got Junk."
O - Other Private/Govt. Entity	Other private/governmental hauler. Examples include the parks department, CalTrans, sewage treament departments, universities, prisons, etc.

VEHICLE TYPE

1. Packer	Packer trucks can be front load, side load, or rear load vehicles
2. DB, Loose	Roll-off loose debris boxes can be closed top or open top. The hauler picks this container up on a rail truck. The container is not a separate trailer.
3 DB, Compacted	Roll-off compacting debris box can be sealed or with small opening in back covered with soft cover. The hauler picks this container up on a rail truck. The container is not a separate traile
4. Pick-up, Van, SUV, Bx Truck, Dump beds	Can be a pick-up, pick-up with trailer, SUV (sport utility vehicle), box truck (i.e. U-Haul), or flat bed truck (truck with no sides or stake sides), passenger or cargo van, or vehicles with hydraulic dump beds.
5. Car	Passenger car
6. Semi-Truck	A 2 or 3 axle tractor pulling a 1 to 3 axle trailer. The trailer can be open or closed top. The trailer can be separated from the tractor.

MATERIAL TYPE

R - Refuse	Garbage from single-family, multi-family, or businesses.
C&D - Construction and Demolition	Waste generated by the activities of construction or demolition
L - Landscaping	Material such as green waste, rock, soil, or other activities generated by landscapers.

GENERATOR TYPE

SF - Single-family Residential	Household garbage, yard waste, or C&D generated at single-family parcels
MF - Multifamily Residential	Household garbage, yard waste, or C&D generated at multifamily parcels
COM - Commercial	Waste generated at industrial, commercial, or institutional parcels
MRF - MRF Residue	Residue generated by sorting recyclables at a Material Recovery Facility

FROM A CONSTRUCTION SITE

No = Not from Const. Site	Circle "No" if the load is not from a Construction and Demolition site.
N=new construction	Circle "N" if the load is from a new construction site.
R=remodel	Circle "R" is load has been generated by renovation activities
D=demolition	Circle "D" if the load has been generated by demolitions activities
RF=roofing	Circle "RF" if load has been generated by roofing activities.
OC=other c&d	Circle "OC" if load has been generated by any other const. or demolition activity

Vehicle Selection Form

CalRecycle2018 Waste Characterization Study
Vehicle Selection Form

Site: Guadalupe LF San Jose **Hand Sort Goal: 12 Samples Total**

Date: September 14, 2018 **Visual Goal: 14 Samples Total**

Each number represents an expected vehicle based on the available data.

Cross off one number for each category of vehicle entering the landfill.

When you reach the number circled, ask this vehicle to go to the sorting area.

When you reach the H on the self-haul couts, that vehicle is to be both visually characterized and then hand sorted as a calibration. All other circled SH are visual only.

RESIDENTIAL: NEED 4 TOTAL

**Must be at least 80% single-family residential waste.*

(1) 2 (3) 4 (5) 6 (7) 8 9 10 11 12 13 14 15 16 17 18 19 20

(expect 15)

COMMERCIAL: NEED 6 TOTAL

**Must be at least 80% commercial waste.*

(1) (2) (3) (4) (5) (6) 7 8 9 10 11 12 13 14 15 16 17 18 19 20

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

(expect 15)

Multi-family Generator Sample NEED 1 TOTAL

Be sure to measure the volume of waste in each garbage container before and after collecting the sample.

SELF-HAUL HAND & VISUAL SORT: NEED 14 TOTAL

1 2 (H) 4 5 6 (7) 8 9 10 (11) 12 13 14 (15) 16 17 18 (19) 20

21 22 (23) 24 25 26 (27) 28 29 30 (31) 32 33 34 (35) 36 37 38 (39) 40

41 42 (43) 44 45 46 (47) 48 49 50 (51) 52 53 54 (55) 56 57 58 59 60

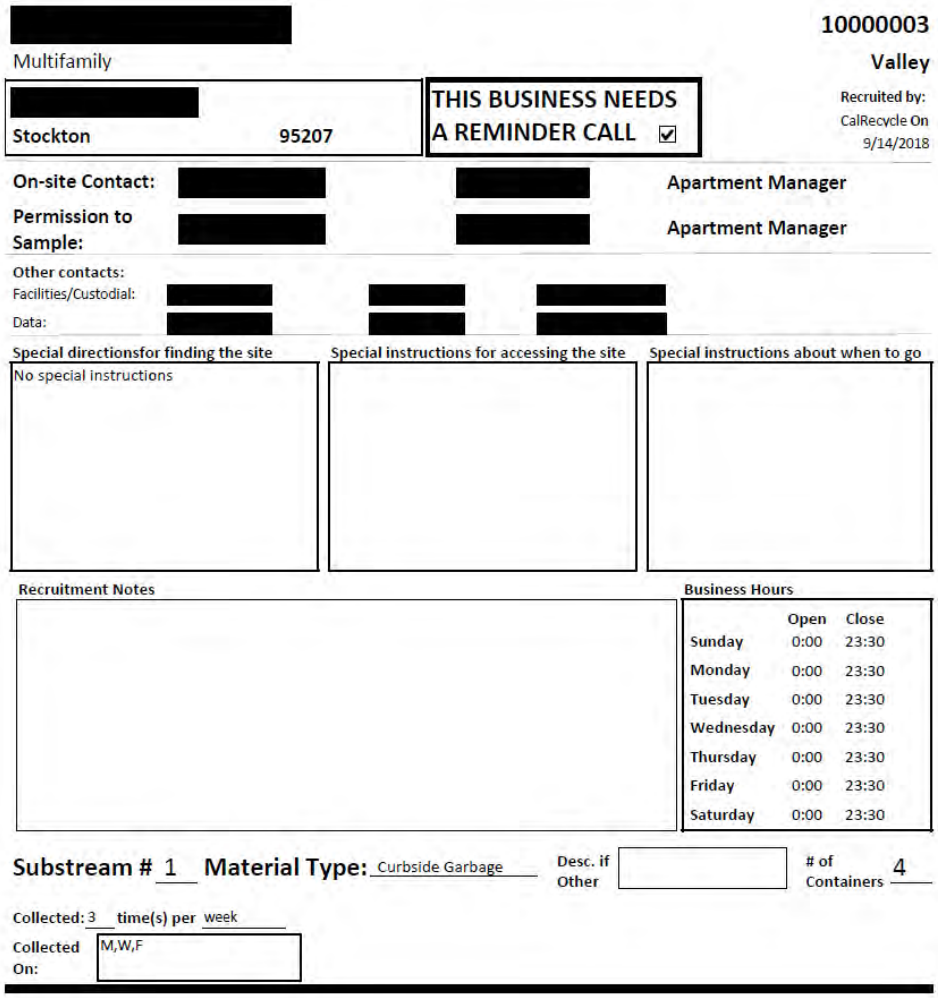
61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120

(expect 80)

Multi-family Site Visit Form (Page 1)



[redacted]

10000003

Multifamily

Valley

[redacted]

Stockton 95207

THIS BUSINESS NEEDS A REMINDER CALL ☑

Recruited by: CalRecycle On 9/14/2018

On-site Contact: [redacted] [redacted] Apartment Manager

Permission to Sample: [redacted] [redacted] Apartment Manager

Other contacts:

Facilities/Custodial: [redacted] [redacted] [redacted]

Data: [redacted] [redacted] [redacted]

Special directionsfor finding the site	Special instructions for accessing the site	Special instructions about when to go
No special instructions		

Recruitment Notes

Business Hours

	Open	Close
Sunday	0:00	23:30
Monday	0:00	23:30
Tuesday	0:00	23:30
Wednesday	0:00	23:30
Thursday	0:00	23:30
Friday	0:00	23:30
Saturday	0:00	23:30

Substream # 1 Material Type: Curbside Garbage Desc. if Other # of Containers 4

Collected: 3 time(s) per week

Collected On: M,W,F

10000003 Page 1 of 3

Multi-family Site Visit Form (Page 2)

Substream # 1 **Material Type:** Curbside Garbage **Desc. if Other** **# of Containers** 4

Container # 1 **Type:** dumpster

Where is the container: Dumpster near the front (near the leasing office)

Locked? ☐

Special instructions to access the container: Behind gate but unlocked, just open the gate and sample

Collection is regular

Collected: 3 **time(s) per** week

Collected On: M,W,F 1pm

Trash is taken out: continuous

If regular, goes out at _____

	Width	Length	Height
Container Volume (inches):			inches
Material volume before sampling (inches):			inches
Material volume after sampling (inches):			inches

Date and time of measurements:

Date and time of last pick-up:

Container # 2 **Type:** dumpster

Where is the container: no special description

Locked? ☐

Special instructions to access the container: no barriers

Collection is regular

Collected: 3 **time(s) per** week

Collected On: M,W,F 1pm

Trash is taken out: continuous

If regular, goes out at _____

	Width	Length	Height
Container Volume (inches):			inches
Material volume before sampling (inches):			inches
Material volume after sampling (inches):			inches

Date and time of measurements:

Date and time of last pick-up:

10000003

Page 2 of 3

Multi-family Site Visit Form (Page 3)

Substream # 1 **Material Type:** Curbside Garbage **Desc. if Other** **# of Containers** 4

Container # 3 **Type:** dumpster

Where is the container: no special description **Locked?** ☐

Special instructions to access the container: no barriers

Collection is regular

Collected: 3 **time(s) per** week

Collected On: M,W,F 1pm

Trash is taken out: continuous

If regular, goes out at _____

	Width	Length	Height
Container Volume (inches):			inches
Material volume before sampling (inches):			inches
Material volume after sampling (inches):			inches

Date and time of measurements:

Date and time of last pick-up:

Container # 4 **Type:** dumpster

Where is the container: no special description **Locked?** ☐

Special instructions to access the container: no barriers

Collection is regular

Collected: 3 **time(s) per** week

Collected On: M,W,F

Trash is taken out: continuous

If regular, goes out at _____

	Width	Length	Height
Container Volume (inches):			inches
Material volume before sampling (inches):			inches
Material volume after sampling (inches):			inches

Date and time of measurements:

Date and time of last pick-up:

Appendix D: Special Considerations

This appendix has been added to document issues related to the study and/or study design:

- The vehicles surveys at primarily unprocessed waste facilities were planned to occur several weeks in advance of the sample collection and sorting. For one facility the vehicle surveys did not occur until after the sampling.
- The vehicle survey data for one facility was accidentally deleted. The field crew made a follow up visit to the facility near the end of the study period to collect new vehicle survey data.
- One facility tracks vehicle data with enough detail that scale house records were used instead of collecting the vehicle survey data in person.
- One facility participated in the vehicle survey, but could not participate in sample collection. The vehicle survey data is included in the study and an extra day of sampling was done at another participating facility in the same county.
- The detail of transaction receipts provided by facilities varied—some facilities provided no data, some provided a week, and others provided an entire year of transaction receipts. These records are not standardized across facilities or even companies, so comparing these records were difficult and provided varying degrees of insight about source sectors of arriving vehicles. Sector allocations for certain facilities may be over-represented or under-represented due to this. These variations may account for differences in data between this study and the 2014 waste characterization study.
- CalRecycle intended to recruit multi-family sites in advance of sample collection activities at a primarily unprocessed waste facility near the multi-family site. For one facility, no multi-family sites could be recruited before sampling at the nearby facility. The field crew returned later in the study and collected a make-up multi-family sample while completing additional work in the area.
- One facility agreed to participate but began a major systems renovation just prior to the scheduled start of field work. Field work at this facility was significantly postponed and considerably lagged the field work at all other facilities.
- While the field team's goal was to sample every 'nth vehicle', sometimes vehicle throughput estimates from vehicle surveys did not match actual field conditions the day of sampling. Occasionally the team had to sample every vehicle coming into the facility until the quota was met.

- One self-haul load each day was to be both hand sorted and visually characterized. This step of the field work was inconsistently implemented and consequently the number of loads with both hand sort and visual characterization data is considerably less than 40. As such, CalRecycle was unable to directly compare the quality of visually characterized self-haul loads, as compared to hand sorts, which are considered the more accurate methodology, even though they are more resource-intensive.
- Because the study assumes hand-sorted samples are representative of the entire load, hand sorted samples and visually characterized samples from the self-haul sector were normalized to 200 pounds in order to maintain comparability.
- Food waste material types were incorrectly sorted in the beginning of the study. Although food waste types were developed and discussed in detail with the contractor, CalRecycle staff discovered about a third of the way through the contract, through a site visit from CalRecycle staff to a sort site, that two types were not being sorted correctly by the field team. The problem was corrected so that types were sorted correctly for the final 2/3 of the study. Data from that part of the study was used to adjust the earlier data.

Appendix E: Conversion Factors

Presented below are conversion factors used for volumetric to weight conversions during visual characterizations.

Material Type	Lbs/yd 3	Source
Corrugated Cardboard	106	U.S. EPA
Paper Bags - Grocery	108	San Diego County
Paper Bags - Other	108	San Diego County
Newspaper/Inserts	360	U.S. EPA
White Office Paper	158	U.S. EPA
Magazines/Catalogs	364	U.S. EPA
Paperboard Packaging	158	U.S. EPA
Mixed Recyclable Paper	158	U.S. EPA
Paper Packaging w/ Metal or Plastic	158	U.S. EPA
Aseptic Containers	158	U.S. EPA
Gable-top Cartons	158	U.S. EPA
Compostable Paper - Packaging	138	Starbucks
Compostable Paper - Non-packaging	138	Starbucks
Remainder/Composite Paper	364	U.S. EPA
Clear Glass Bottles/Containers - CRV	380	U.S. EPA
Clear Glass Bottles/Containers - Non-CRV	380	U.S. EPA
Green Glass Bottles/Containers - CRV	380	U.S. EPA
Green Glass Bottles/Containers - Non-CRV	380	U.S. EPA
Brown Glass Bottles/Containers - CRV	380	U.S. EPA
Brown Glass Bottles/Containers - Non-CRV	380	U.S. EPA
Other Colored Glass Bottles/Containers	380	U.S. EPA
Remainder/Composite Glass	1,400	U.S. EPA
Tin/Steel Cans	150	U.S. EPA
Metal Appliances	145	CIWMB2004
Other Ferrous	225	CIWMB2004
Aluminum Cans - CRV	65	U.S. EPA
Aluminum Cans - Non-CRV	65	U.S. EPA
Other Non-Ferrous	225	U.S. EPA
Remainder/Composite Metal	143	Average of metals, without Used Oil Filters
#1 PET Bottles CRV	35	U.S. EPA
#1 PET Bottles Non-CRV	35	U.S. EPA
#1 PET Non-Bottle/ Thermoform	35	U.S. EPA
#2 HDPE Bottles CRV	24	U.S. EPA
#2 HDPE Bottles Non-CRV	24	U.S. EPA
#2 HDPE Non-bottle	24	U.S. EPA
#5 PP Containers & Packaging	35	U.S. EPA

Material Type	Lbs/yd 3	Source
#3, #4, #6, #7,Other Plastic Containers/ Packaging	35	U.S. EPA
Expanded Polystyrene	10	Tellus
Plastic Trash Bags	23	Tellus
Plastic Grocery and Other Merchandise Bags	23	Tellus
Non-Bag Comm.&Indus. Packaging Film	23	Tellus
Film Products	23	Tellus
Flexible Plastic Pouches	23	Tellus
Other Film	23	Tellus
Durable Plastics	50	U.S. EPA
Remainder/Composite Plastic	50	U.S. EPA
Large Equipment (not including large appliances)	343	U.S. EPA
Consumer Electronics and Small Equipment	354	U.S. EPA
Covered Video Display Devices	67	U.S. EPA
Food - Intact or Packaged Fresh Vegetative	486	FEECO, Tellus
Food - Packaged Eggs, Dairy, and Dairy Alternatives	486	FEECO, Tellus
Food - Packaged Meat/Fish	486	FEECO, Tellus
Food - Packaged Prepared/Perishable Items	486	FEECO, Tellus
Food - Packaged Non-perishable	486	FEECO, Tellus
Food - Not Donatable - Meat	486	FEECO, Tellus
Food - Not Donatable - Non-meat	486	FEECO, Tellus
Food - Inedible	486	FEECO, Tellus
Leaves and Grass	313	U.S. EPA
Prunings and Trimmings	127	CIWMB2004
Branches and Stumps	127	CIWMB2004
Manures	675	FEECO
Wood - Clean Dimensional Lumber	169	CIWMB2004
Wood - Clean Engineered	268	CIWMB2004
Wood - Clean Pallets & Crates	169	CIWMB2004
Wood - Treated/Painted/Stained	169	CIWMB2004
Wood - Other Recyclable	169	CIWMB2004
Other Compostable Organics	250	U.S. EPA
Concrete	860	CIWMB2004
Asphalt Paving	773	U.S. EPA
Asphalt Roofing	731	U.S. EPA
Gypsum Board	467	U.S. EPA
Carpet	147	U.S. EPA
Rock, Soil and Dirt	999	U.S. EPA
Other C&D	417	CIWMB2004

Material Type	Lbs/yd 3	Source
Paint	1,836	Tellus
Used Oil	1,525	Tellus
Lead-Acid (Automotive) Batteries	2,400	CIWMB Staff Estimate
Other Batteries	2,400	CIWMB Staff Estimate
One-Pound Propane Gas Cylinders	225	Same as other ferrous
Pharmaceuticals	486	FEECO
Remainder/Composite Household Hazardous	1,671	Average of HHW liquids
Tires	23	U.S. EPA
Bulky Items	80	Tellus
Mattresses and Foundations	50	U.S. EPA
Remainder/Composite Special Waste	140	Average of Bulky Items and Tires density
Textiles - Organic	150	U.S. EPA
Textiles - Synthetic, Mixed, Unknown	150	U.S. EPA
Textiles - Shoes, Purses Belts	150	U.S. EPA
Diapers & Sanitary Products	1,150	UWMedical
Solar Panels	150	U.S. EPA
Miscellaneous	250	U.S. EPA
Mixed Residue - 2" minus	999	FEECO
MRF residual fines	999	FEECO
Miscellaneous Inorganic	417	Average of C&D materials

Appendix F: Accessible Version of Tables and Figures

Figure 1. Accessible Figure of Overview of Selection and Recruitment for Sampling Sites

Step	Description
1	Determined composition of waste disposed by material type for each sector and sub-sector: commercial, residential (single-family & multi-family), self-haul.
1a	Sampled disposed material at 34 landfills in CA accepting the most direct hauled waste into 94 material types by sector (commercial, residential & self-haul).
1b	Sampled disposed material at 40 multi-family housing units in CA into 94 material types.
2	Used vehicle surveys and transaction records to estimate annual breakdown of materials disposed by sector for each landfill.
3	Extrapolated to statewide results using regional tonnage data from CalRecycle's Disposal Reporting System (DRS).

Figure 2. Source Data for Figure of Material Classes in California's Overall Disposed Waste Stream

Material Class	Est. Percent
Organic	34.1%
Paper	16.6%
Inerts and Others	14.1%
Plastic	11.5%
Miscellaneous	9.8%
Special Waste	6.7%
Metal	4.6%
Glass	1.7%
Electronic	0.6%
HHW	0.2%
Total	**100%**

Figure 3. Source Data for Figure of Material Classes in Franchised Commercial Disposed Waste

Material Class	Est. Percent
Organic	36.4%
Paper	24.2%
Plastic	14.4%
Miscellaneous	8.8%
Inerts and Others	5.5%
Metal	4.4%

Special Waste	3.7%
Glass	1.8%
Electronic	0.6%
HHW	0.3%
Total	**100%**

Figure 4. Source Data for Figure of Material Classes in Franchised Single-Family Residential Disposed Waste

Material Class	Est. Percent
Organic	32.6%
Miscellaneous	20.7%
Paper	19.5%
Plastic	13.9%
Inerts and Others	4.3%
Metal	4.1%
Glass	2.2%
Special Waste	1.7%
Electronic	0.6%
HHW	0.3%
Total	**100%**

Figure 5. Source Data for Figure of Material Classes in Franchised Multi-Family Residential Disposed Waste

Material Class	Est. Percent
Organic	31.2%
Paper	19.2%
Miscellaneous	16.9%
Plastic	10.3%
Special Waste	10.2%
Glass	4.7%
Metal	4.5%
Inerts and Others	1.7%
Electronic	0.7%
HHW	0.6%
Total	**100%**

Figure 6. Source Data for Figure of Material Classes in Self-Haul Disposed Waste

Material Class	Est. Percent
Inerts and Others	36%
Organic	32%
Special Waste	15%

Plastic	6%
Metal	5%
Paper	3%
Miscellaneous	1%
Glass	1%
Electronic	0%
HHW	0%
Total	**100%**

Table 4. Accessible Table of Material Composition of California's Overall Disposed Waste Stream

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total Paper	**16.6%**		**6,525,762**
Uncoated Corrugated Cardboard	5.2%	0.2%	2,037,360
Paper Grocery Bags	0.1%	0.0%	29,248
Other Paper Bags/Kraft Paper	0.4%	0.0%	159,212
Newspapers/Newspaper Inserts	0.7%	0.1%	276,453
White Office-type Paper and Mail	0.4%	0.1%	156,662
Magazines and Catalogs	0.4%	0.0%	161,958
Folding Cartons and Other Paperboard Packaging	1.2%	0.0%	457,564
Other Recyclable Paper	1.4%	0.1%	559,779
Miscellaneous Paper Packaging	0.9%	0.1%	352,975
Aseptic Containers	0.1%	0.0%	28,002
Gable-top Cartons	0.1%	0.0%	46,766
Compostable Paper - Packaging	1.3%	0.1%	515,393
Compostable Paper - Non-packaging	3.9%	0.1%	1,531,324
Remainder/Composite Paper - Other	0.5%	0.1%	213,067
Total Glass	**1.7%**		**658,952**
Clear Glass Bottles and Containers - CRV	0.4%	0.0%	157,110
Clear Glass Bottles and Containers - Non-CRV	0.5%	0.0%	182,580
Green Glass Bottles and Containers - CRV	0.1%	0.0%	25,814
Green Glass Bottles and Containers - Non-CRV	0.3%	0.0%	111,804
Brown Glass Bottles and Containers - CRV	0.2%	0.0%	81,903
Brown Glass Bottles and Containers - Non-CRV	0.0%	0.0%	16,805
Other Colored Glass Bottles and Containers	0.0%	0.0%	6,331
Remainder/Composite Glass	0.2%	0.0%	76,605
Total Metal	**4.6%**		**1,811,134**
Remainder/Composite Metal	1.0%	0.2%	388,923

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Other Ferrous	1.0%	0.1%	408,151
Aluminum Cans - CRV	0.1%	0.0%	52,830
Tin/Steel Cans	0.8%	0.1%	299,777
Major Appliances	0.5%	0.1%	194,962
Aluminum Cans - Non-CRV	0.0%	0.0%	5,415
Other Non-Ferrous	1.2%	0.1%	461,077
Total Plastic	**11.5%**		**4,524,052**
PETE Containers - CRV	0.3%	0.0%	128,410
PETE Containers - Non-CRV	0.1%	0.0%	58,855
PETE Containers, Lids, and other Packaging	0.3%	0.0%	113,793
HDPE Containers - CRV	0.0%	0.0%	7,374
HDPE Containers - Non-CRV	0.4%	0.0%	158,020
HDPE Containers, Lids, and other Packaging	0.1%	0.0%	25,748
Polypropylene Containers and Packaging	0.6%	0.0%	242,664
Other Plastic Containers and Packaging	0.3%	0.0%	136,479
Expanded Polystyrene Packaging	0.5%	0.0%	209,172
Plastic Trash Bags	1.7%	0.1%	655,233
Plastic Grocery and Other Merchandise Bags	0.4%	0.0%	139,810
Non-Bag Commercial and Industrial Packaging Film	1.0%	0.1%	393,308
Film Products	0.5%	0.1%	202,512
Flexible Plastic Pouches	0.1%	0.0%	22,059
Other Film	2.4%	0.1%	936,713
Durable Plastic Items	1.8%	0.1%	687,944
Remainder/Composite Plastic	1.0%	0.1%	405,956
Total Electronics	**0.6%**		**228,480**
Large Equipment	0.2%	0.0%	86,218
Consumer Electronics and Small Equipment	0.3%	0.1%	127,308
Covered Video Display Devices	0.0%	0.0%	14,954
Total Organic	**34.1%**		**13,397,041**
Food - Potentially Donatable - Vegetative	1.5%	0.2%	577,303
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.2%	0.0%	69,497
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	84,608
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.4%	0.1%	153,255
Food - Potentially Donatable - Packaged Non-perishable	0.6%	0.1%	232,584
Food - Not Donatable - Meat	1.1%	0.1%	436,986
Food - Not Donatable - Non-meat	9.5%	0.3%	3,752,620

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Food - Inedible	1.4%	0.1%	552,682
Leaves and Grass	2.3%	0.2%	905,885
Prunings and Trimmings	3.1%	0.3%	1,221,926
Branches and Stumps	1.5%	0.2%	608,127
Manures	0.6%	0.2%	254,093
Clean Dimensional Lumber	2.0%	0.2%	802,353
Clean Engineered Wood	2.2%	0.2%	875,510
Clean Pallets and Crates	2.2%	0.2%	872,840
Wood Waste - Treated/Painted/Stained	4.4%	0.3%	1,740,699
Other Recyclable Wood	0.0%	0.0%	13,824
Remainder/Composite Organic	0.6%	0.1%	242,248
Total Inerts and Others	**14.1%**		**5,556,049**
Concrete	1.5%	0.2%	604,195
Asphalt Paving	0.0%	0.0%	5,077
Asphalt Roofing	1.7%	0.2%	687,155
Gypsum Board	1.9%	0.2%	754,446
Carpet	1.6%	0.2%	627,926
Rock, Soil and Fines	2.6%	0.3%	1,018,002
Remainder/Composite Inerts and Other	4.7%	0.4%	1,859,249
Total HHW	**0.2%**		**95,996**
Paint	0.0%	0.0%	13,913
Used Oil	0.0%	0.0%	2,994
Lead-acid (Automotive) Batteries	0.0%	0.0%	6,900
Other Batteries	0.0%	0.0%	8,892
One-Pound Propane Gas Cylinders	0.0%	0.0%	1,754
Pharmaceuticals	0.1%	0.0%	21,773
Remainder/Composite Household Hazardous	0.1%	0.0%	39,769
Total Special Waste	**6.7%**		**2,639,651**
Tires	0.4%	0.2%	161,150
Bulky Items	5.3%	0.4%	2,074,965
Mattresses and Foundations	0.7%	0.1%	265,399
Remainder/Composite Special Waste	0.4%	0.1%	138,137
Miscellaneous	**9.8%**		**3,867,339**
Textiles - Organic	1.1%	0.1%	434,956
Textiles - Synthetic, Mixed, Unknown	1.6%	0.1%	644,473
Textiles - Shoes, Purses, Belts	0.3%	0.0%	120,032

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Solar Panels	0.0%	0.0%	1,990
Diapers and Sanitary Products	2.3%	0.1%	895,351
Remainder/Composite Organic - Non-compostable	0.4%	0.1%	147,514
Mixed Residue	3.1%	0.1%	1,225,126
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	1.0%	0.1%	397,895
Total	**100.0%**		**39,304,457**
Sample Count	**892**		

Table 6. Accessible Table of Material Composition of Franchised Commercial Disposed Waste

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total Paper	**24.2%**		**3,980,864**
Uncoated Corrugated Cardboard	9.4%	0.5%	1,553,334
Paper Grocery Bags	0.1%	0.0%	10,558
Other Paper Bags/Kraft Paper	0.5%	0.1%	85,591
Newspapers/Newspaper Inserts	0.8%	0.2%	124,008
White Office-type Paper and Mail	0.7%	0.2%	112,958
Magazines and Catalogs	0.4%	0.1%	73,888
Folding Cartons and Other Paperboard Packaging	1.3%	0.1%	212,948
Other Recyclable Paper	1.8%	0.2%	300,645
Miscellaneous Paper Packaging	0.9%	0.1%	145,653
Aseptic Containers	0.1%	0.0%	13,998
Gable-top Cartons	0.2%	0.0%	29,437
Compostable Paper - Packaging	2.2%	0.2%	364,421
Compostable Paper - Non-packaging	4.9%	0.3%	812,892
Remainder/Composite Paper - Other	0.9%	0.2%	140,533
Total Glass	**1.8%**		**293,879**
Clear Glass Bottles and Containers - CRV	0.4%	0.0%	66,902
Clear Glass Bottles and Containers - Non-CRV	0.4%	0.0%	67,536
Green Glass Bottles and Containers - CRV	0.1%	0.0%	18,730
Green Glass Bottles and Containers - Non-CRV	0.4%	0.1%	65,450
Brown Glass Bottles and Containers - CRV	0.2%	0.0%	39,285

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Brown Glass Bottles and Containers - Non-CRV	0.0%	0.0%	5,945
Other Colored Glass Bottles and Containers	0.0%	0.0%	3,375
Remainder/Composite Glass	0.2%	0.0%	26,655
Total Metal	**4.4%**		**727,929**
Remainder/Composite Metal	0.1%	0.0%	21,843
Other Ferrous	0.0%	0.0%	984
Aluminum Cans - CRV	0.5%	0.2%	84,767
Tin/Steel Cans	1.0%	0.2%	161,249
Major Appliances	0.9%	0.2%	155,047
Aluminum Cans - Non-CRV	1.4%	0.3%	223,056
Other Non-Ferrous	0.5%	0.1%	80,984
Total Plastic	**14.4%**		**2,370,710**
PETE Containers - CRV	0.4%	0.0%	63,639
PETE Containers - Non-CRV	0.1%	0.0%	19,609
PETE Containers, Lids, and other Packaging	0.3%	0.0%	55,949
HDPE Containers - CRV	0.0%	0.0%	1,652
HDPE Containers - Non-CRV	0.5%	0.1%	86,567
HDPE Containers, Lids, and other Packaging	0.1%	0.0%	18,852
Polypropylene Containers and Packaging	0.7%	0.1%	121,448
Other Plastic Containers and Packaging	0.5%	0.0%	80,092
Expanded Polystyrene Packaging	0.7%	0.1%	107,609
Plastic Trash Bags	2.1%	0.1%	342,379
Plastic Grocery and Other Merchandise Bags	0.2%	0.0%	34,932
Non-Bag Commercial and Industrial Packaging Film	2.2%	0.3%	362,954
Film Products	0.6%	0.3%	100,808
Flexible Plastic Pouches	0.1%	0.0%	8,854
Other Film	2.3%	0.2%	375,865
Durable Plastic Items	2.1%	0.2%	339,476
Remainder/Composite Plastic	1.5%	0.2%	250,024
Total Electronics	**0.6%**		**105,530**
Large Equipment	0.1%	0.0%	24,225
Consumer Electronics and Small Equipment	0.5%	0.1%	77,302
Covered Video Display Devices	0.0%	0.0%	4,003
Total Organic	**36.4%**		**5,986,788**
Food - Potentially Donatable - Vegetative	2.3%	0.5%	386,920
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.3%	0.1%	44,859

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Food - Potentially Donatable - Animal Meat	0.4%	0.1%	59,875
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.5%	0.2%	80,191
Food - Potentially Donatable - Packaged Non-perishable	0.9%	0.4%	150,239
Food - Not Donatable - Meat	1.7%	0.2%	282,569
Food - Not Donatable - Non-meat	12.0%	0.6%	1,971,705
Food - Inedible	1.9%	0.1%	319,831
Leaves and Grass	1.9%	0.3%	317,711
Prunings and Trimmings	2.6%	0.4%	432,800
Branches and Stumps	0.8%	0.2%	136,348
Manures	1.0%	0.3%	164,734
Clean Dimensional Lumber	1.8%	0.3%	301,163
Clean Engineered Wood	1.7%	0.3%	278,824
Clean Pallets and Crates	3.9%	0.6%	648,578
Wood Waste - Treated/Painted/Stained	2.0%	0.2%	334,537
Other Recyclable Wood	0.0%	0.0%	4,054
Remainder/Composite Organic	0.4%	0.1%	71,850
Total Inerts and Others	**5.5%**		**901,365**
Concrete	0.7%	0.2%	107,811
Asphalt Paving	0.0%	0.0%	49
Asphalt Roofing	0.1%	0.0%	19,144
Gypsum Board	0.8%	0.2%	125,731
Carpet	1.4%	0.4%	225,347
Rock, Soil and Fines	0.6%	0.3%	96,729
Remainder/Composite Inerts and Other	2.0%	0.3%	326,554
Total HHW	**0.3%**		**48,118**
Paint	0.0%	0.0%	4,378
Used Oil	0.0%	0.0%	2,336
Lead-acid (Automotive) Batteries	0.0%	0.0%	15
Other Batteries	0.0%	0.0%	2,853
One-Pound Propane Gas Cylinders	0.0%	0.0%	245
Pharmaceuticals	0.1%	0.1%	16,045
Remainder/Composite Household Hazardous	0.1%	0.0%	22,246
Total Special Waste	**3.7%**		**602,511**
Tires	0.8%	0.3%	128,657
Bulky Items	1.5%	0.2%	241,110
Mattresses and Foundations	0.6%	0.2%	104,303

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Remainder/Composite Special Waste	0.8%	0.3%	128,441
Total Miscellaneous	**8.8%**		**1,449,911**
Textiles - Organic	1.2%	0.2%	205,725
Textiles - Synthetic, Mixed, Unknown	1.4%	0.2%	235,203
Textiles - Shoes, Purses, Belts	0.3%	0.0%	46,784
Solar Panels	0.0%	0.0%	0
Diapers and Sanitary Products	1.2%	0.2%	199,794
Remainder/Composite Organic - Non-compostable	0.6%	0.3%	97,459
Mixed Residue	2.6%	0.1%	421,878
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	1.5%	0.3%	243,068
Total	**100.0%**		**16,467,606**
Sample Count	**281**		

Table 8. Accessible Table of Material Composition of Single-Family Residential Disposed Waste

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total Paper	**19.5%**		**1,837,373**
Uncoated Corrugated Cardboard	2.1%	0.2%	195,045
Paper Grocery Bags	0.1%	0.0%	13,907
Other Paper Bags/Kraft Paper	0.6%	0.0%	60,853
Newspapers/Newspaper Inserts	1.1%	0.1%	104,599
White Office-type Paper and Mail	0.4%	0.1%	36,339
Magazines and Catalogs	0.7%	0.1%	68,210
Folding Cartons and Other Paperboard Packaging	2.2%	0.1%	206,421
Other Recyclable Paper	2.3%	0.1%	212,305
Miscellaneous Paper Packaging	1.4%	0.1%	136,357
Aseptic Containers	0.1%	0.0%	12,070
Gable-top Cartons	0.1%	0.0%	13,642
Compostable Paper - Packaging	1.4%	0.1%	127,330
Compostable Paper - Non-packaging	6.7%	0.2%	627,316
Remainder/Composite Paper - Other	0.2%	0.0%	22,980
Total Glass	**2.2%**		**205,593**
Clear Glass Bottles and Containers - CRV	0.5%	0.0%	42,924

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Clear Glass Bottles and Containers - Non-CRV	0.7%	0.1%	65,244
Green Glass Bottles and Containers - CRV	0.1%	0.0%	5,479
Green Glass Bottles and Containers - Non-CRV	0.4%	0.1%	40,499
Brown Glass Bottles and Containers - CRV	0.3%	0.1%	30,662
Brown Glass Bottles and Containers - Non-CRV	0.1%	0.0%	5,698
Other Colored Glass Bottles and Containers	0.0%	0.0%	1,233
Remainder/Composite Glass	0.1%	0.0%	13,854
Total Metal	**4.1%**		**384,389**
Remainder/Composite Metal	1.0%	0.0%	94,985
Other Ferrous	0.5%	0.2%	45,155
Aluminum Cans - CRV	0.9%	0.1%	85,238
Tin/Steel Cans	0.2%	0.0%	20,968
Major Appliances	0.0%	0.0%	2,586
Aluminum Cans - Non-CRV	0.9%	0.1%	84,605
Other Non-Ferrous	0.5%	0.1%	50,852
Total Plastic	**13.9%**		**1,313,602**
PETE Containers - CRV	0.5%	0.0%	44,502
PETE Containers - Non-CRV	0.3%	0.0%	29,791
PETE Containers, Lids, and other Packaging	0.5%	0.0%	43,182
HDPE Containers - CRV	0.0%	0.0%	4,665
HDPE Containers - Non-CRV	0.6%	0.0%	53,247
HDPE Containers, Lids, and other Packaging	0.1%	0.0%	5,771
Polypropylene Containers and Packaging	1.1%	0.0%	104,620
Other Plastic Containers and Packaging	0.5%	0.0%	44,081
Expanded Polystyrene Packaging	0.8%	0.1%	79,054
Plastic Trash Bags	1.9%	0.1%	175,185
Plastic Grocery and Other Merchandise Bags	0.7%	0.0%	66,961
Non-Bag Commercial and Industrial Packaging Film	0.2%	0.0%	14,576
Film Products	0.4%	0.2%	34,075
Flexible Plastic Pouches	0.1%	0.0%	8,346
Other Film	2.8%	0.1%	263,928
Durable Plastic Items	2.5%	0.3%	232,044
Remainder/Composite Plastic	1.2%	0.2%	109,574
Total Electronics	**0.6%**		**56,710**
Large Equipment	0.3%	0.1%	32,854
Consumer Electronics and Small Equipment	0.2%	0.0%	20,093

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Covered Video Display Devices	0.0%	0.0%	3,762
Total Organic	**32.6%**		**3,076,079**
Food - Potentially Donatable - Vegetative	1.3%	0.1%	126,189
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.2%	0.0%	16,834
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	16,745
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.6%	0.2%	58,895
Food - Potentially Donatable - Packaged Non-perishable	0.6%	0.1%	60,656
Food - Not Donatable - Meat	1.2%	0.1%	114,669
Food - Not Donatable - Non-meat	14.2%	0.6%	1,337,106
Food - Inedible	1.6%	0.1%	148,741
Leaves and Grass	3.2%	0.5%	299,253
Prunings and Trimmings	3.1%	0.4%	291,231
Branches and Stumps	1.2%	0.3%	109,378
Manures	0.9%	0.4%	89,359
Clean Dimensional Lumber	0.8%	0.2%	74,352
Clean Engineered Wood	0.8%	0.2%	77,799
Clean Pallets and Crates	0.0%	0.0%	170
Wood Waste - Treated/Painted/Stained	2.0%	0.3%	192,837
Other Recyclable Wood	0.1%	0.1%	9,672
Remainder/Composite Organic	0.6%	0.1%	52,192
Total Inerts and Others	**4.3%**		**408,197**
Concrete	0.2%	0.1%	21,751
Asphalt Paving	0.0%	0.0%	0
Asphalt Roofing	0.3%	0.2%	32,956
Gypsum Board	0.2%	0.1%	15,663
Carpet	1.3%	0.3%	119,435
Rock, Soil and Fines	0.9%	0.2%	85,346
Remainder/Composite Inerts and Other	1.4%	0.5%	133,047
Total HHW	**0.3%**		**30,577**
Paint	0.1%	0.0%	8,862
Used Oil	0.0%	0.0%	658
Lead-acid (Automotive) Batteries	0.0%	0.0%	394
Other Batteries	0.0%	0.0%	3,805
One-Pound Propane Gas Cylinders	0.0%	0.0%	1,377
Pharmaceuticals	0.0%	0.0%	4,328
Remainder/Composite Household Hazardous	0.1%	0.0%	11,154

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total Special Waste	**1.7%**		**158,354**
Tires	0.0%	0.0%	2,987
Bulky Items	1.1%	0.3%	104,300
Mattresses and Foundations	0.4%	0.3%	42,089
Remainder/Composite Special Waste	0.1%	0.0%	8,978
Total Miscellaneous	**20.7%**		**1,950,604**
Textiles - Organic	1.9%	0.2%	175,586
Textiles - Synthetic, Mixed, Unknown	3.6%	0.3%	340,794
Textiles - Shoes, Purses, Belts	0.6%	0.1%	56,921
Solar Panels	0.0%	0.0%	1,840
Diapers and Sanitary Products	6.3%	0.4%	591,089
Remainder/Composite Organic - Non-compostable	0.3%	0.1%	23,807
Mixed Residue	6.9%	0.4%	649,942
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	1.2%	0.1%	110,624
Total	**100.0%**		**9,421,478**
Sample Count	**122**		

Table 10. Accessible Table of Material Composition of Multi-Family Residential Disposed Waste

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total Paper	**19.2%**		**347,548**
Uncoated Corrugated Cardboard	3.4%	0.4%	61,877
Paper Grocery Bags	0.2%	0.0%	4,367
Other Paper Bags/Kraft Paper	0.4%	0.0%	7,602
Newspapers/Newspaper Inserts	2.3%	0.5%	41,394
White Office-type Paper and Mail	0.2%	0.1%	3,625
Magazines and Catalogs	0.8%	0.2%	14,958
Folding Cartons and Other Paperboard Packaging	2.0%	0.2%	36,945
Other Recyclable Paper	2.5%	0.4%	45,301
Miscellaneous Paper Packaging	0.8%	0.1%	14,392
Aseptic Containers	0.1%	0.0%	1,563
Gable-top Cartons	0.2%	0.0%	3,433
Compostable Paper - Packaging	1.0%	0.2%	17,247

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Compostable Paper - Non-packaging	5.0%	0.3%	90,446
Remainder/Composite Paper - Other	0.2%	0.1%	4,399
Total Glass	**4.7%**		**85,181**
Clear Glass Bottles and Containers - CRV	1.2%	0.3%	22,198
Clear Glass Bottles and Containers - Non-CRV	1.8%	0.2%	33,103
Green Glass Bottles and Containers - CRV	0.1%	0.0%	1,297
Green Glass Bottles and Containers - Non-CRV	0.3%	0.1%	5,748
Brown Glass Bottles and Containers - CRV	0.6%	0.1%	10,989
Brown Glass Bottles and Containers - Non-CRV	0.3%	0.2%	5,111
Other Colored Glass Bottles and Containers	0.1%	0.0%	1,569
Remainder/Composite Glass	0.3%	0.1%	5,166
Total Metal	**4.5%**		**81,081**
Remainder/Composite Metal	0.9%	0.1%	15,832
Other Ferrous	0.5%	0.4%	8,797
Aluminum Cans - CRV	1.6%	0.9%	28,884
Tin/Steel Cans	0.2%	0.0%	3,272
Major Appliances	0.0%	0.0%	634
Aluminum Cans - Non-CRV	0.5%	0.1%	9,543
Other Non-Ferrous	0.8%	0.5%	14,120
Total Plastic	**10.3%**		**186,978**
PETE Containers - CRV	0.6%	0.0%	11,260
PETE Containers - Non-CRV	0.5%	0.1%	9,440
PETE Containers, Lids, and other Packaging	0.4%	0.0%	7,375
HDPE Containers - CRV	0.0%	0.0%	541
HDPE Containers - Non-CRV	0.8%	0.1%	15,273
HDPE Containers, Lids, and other Packaging	0.1%	0.0%	1,125
Polypropylene Containers and Packaging	0.9%	0.1%	16,025
Other Plastic Containers and Packaging	0.4%	0.0%	7,245
Expanded Polystyrene Packaging	0.5%	0.0%	9,016
Plastic Trash Bags	1.0%	0.1%	19,000
Plastic Grocery and Other Merchandise Bags	0.7%	0.1%	11,947
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	525
Film Products	0.0%	0.0%	690
Flexible Plastic Pouches	0.1%	0.0%	1,263
Other Film	2.2%	0.1%	40,267
Durable Plastic Items	1.5%	0.2%	27,947

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Remainder/Composite Plastic	0.4%	0.0%	8,039
Total Electronics	**0.7%**		**12,515**
Large Equipment	0.0%	0.0%	257
Consumer Electronics and Small Equipment	0.5%	0.2%	8,945
Covered Video Display Devices	0.2%	0.2%	3,314
Total Organic	**31.2%**		**565,046**
Food - Potentially Donatable - Vegetative	2.7%	0.3%	49,704
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.3%	0.1%	5,301
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	3,654
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.6%	0.1%	10,813
Food - Potentially Donatable - Packaged Non-perishable	1.0%	0.2%	17,569
Food - Not Donatable - Meat	2.4%	0.3%	42,836
Food - Not Donatable - Non-meat	16.2%	1.3%	292,941
Food - Inedible	1.2%	0.2%	21,795
Leaves and Grass	2.1%	0.8%	37,782
Prunings and Trimmings	1.9%	0.6%	35,065
Branches and Stumps	0.2%	0.1%	3,123
Manures	0.0%	0.0%	0
Clean Dimensional Lumber	0.0%	0.0%	0
Clean Engineered Wood	0.1%	0.0%	1,081
Clean Pallets and Crates	0.0%	0.0%	0
Wood Waste - Treated/Painted/Stained	1.3%	0.6%	24,320
Other Recyclable Wood	0.0%	0.0%	98
Remainder/Composite Organic	1.0%	0.3%	18,964
Total Inerts and Others	**1.7%**		**30,490**
Concrete	0.0%	0.0%	0
Asphalt Paving	0.0%	0.0%	0
Asphalt Roofing	0.0%	0.0%	424
Gypsum Board	0.1%	0.1%	2,223
Carpet	0.1%	0.1%	1,194
Rock, Soil and Fines	0.2%	0.1%	3,233
Remainder/Composite Inerts and Other	1.3%	0.7%	23,417
Total HHW	**0.6%**		**11,447**
Paint	0.0%	0.0%	673
Used Oil	0.0%	0.0%	0
Lead-acid (Automotive) Batteries	0.4%	0.3%	6,491

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Other Batteries	0.0%	0.0%	854
One-Pound Propane Gas Cylinders	0.0%	0.0%	132
Pharmaceuticals	0.1%	0.0%	1,400
Remainder/Composite Household Hazardous	0.1%	0.0%	1,897
Total Special Waste	**10.2%**		**184,367**
Tires	0.0%	0.0%	114
Bulky Items	7.4%	2.5%	134,333
Mattresses and Foundations	2.7%	1.1%	49,201
Remainder/Composite Special Waste	0.0%	0.0%	718
Total Miscellaneous	**16.9%**		**306,198**
Textiles - Organic	1.0%	0.2%	18,393
Textiles - Synthetic, Mixed, Unknown	1.6%	0.2%	28,213
Textiles - Shoes, Purses, Belts	0.6%	0.2%	10,242
Solar Panels	0.0%	0.0%	0
Diapers and Sanitary Products	5.7%	0.6%	103,813
Remainder/Composite Organic - Non-compostable	0.3%	0.1%	4,713
Mixed Residue	6.4%	0.9%	115,604
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	1.4%	0.2%	25,220
Total	**100.0%**		**1,810,852**
Sample Count	**40**		

Table 12. Accessible Table of Material Composition of Self-Hauled Disposed Waste

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total Paper	**3.1%**		**359,978**
Uncoated Corrugated Cardboard	2.0%	0.4%	227,104
Paper Grocery Bags	0.0%	0.0%	416
Other Paper Bags/Kraft Paper	0.0%	0.0%	5,165
Newspapers/Newspaper Inserts	0.1%	0.0%	6,451
White Office-type Paper and Mail	0.0%	0.0%	3,741
Magazines and Catalogs	0.0%	0.0%	4,902
Folding Cartons and Other Paperboard Packaging	0.0%	0.0%	1,250
Other Recyclable Paper	0.0%	0.0%	1,529

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Miscellaneous Paper Packaging	0.5%	0.2%	56,573
Aseptic Containers	0.0%	0.0%	370
Gable-top Cartons	0.0%	0.0%	255
Compostable Paper - Packaging	0.1%	0.0%	6,396
Compostable Paper - Non-packaging	0.0%	0.0%	670
Remainder/Composite Paper - Other	0.4%	0.2%	45,156
Total Glass	**0.6%**		**74,299**
Clear Glass Bottles and Containers - CRV	0.2%	0.1%	25,086
Clear Glass Bottles and Containers - Non-CRV	0.1%	0.0%	16,697
Green Glass Bottles and Containers - CRV	0.0%	0.0%	309
Green Glass Bottles and Containers - Non-CRV	0.0%	0.0%	107
Brown Glass Bottles and Containers - CRV	0.0%	0.0%	967
Brown Glass Bottles and Containers - Non-CRV	0.0%	0.0%	51
Other Colored Glass Bottles and Containers	0.0%	0.0%	153
Remainder/Composite Glass	0.3%	0.1%	30,930
Total Metal	**5.3%**		**617,735**
Remainder/Composite Metal	0.9%	0.2%	107,977
Other Ferrous	0.5%	0.1%	56,242
Aluminum Cans - CRV	1.1%	0.2%	132,780
Tin/Steel Cans	0.1%	0.0%	6,747
Major Appliances	0.0%	0.0%	1,211
Aluminum Cans - Non-CRV	1.8%	0.4%	211,883
Other Non-Ferrous	0.9%	0.3%	100,894
Total Plastic	**5.6%**		**652,762**
PETE Containers - CRV	0.1%	0.1%	9,009
PETE Containers - Non-CRV	0.0%	0.0%	16
PETE Containers, Lids, and other Packaging	0.1%	0.1%	7,287
HDPE Containers - CRV	0.0%	0.0%	516
HDPE Containers - Non-CRV	0.0%	0.0%	2,933
HDPE Containers, Lids, and other Packaging	0.0%	0.0%	0
Polypropylene Containers and Packaging	0.0%	0.0%	572
Other Plastic Containers and Packaging	0.0%	0.0%	5,061
Expanded Polystyrene Packaging	0.1%	0.0%	13,494
Plastic Trash Bags	1.0%	0.2%	118,669
Plastic Grocery and Other Merchandise Bags	0.2%	0.0%	25,970
Non-Bag Commercial and Industrial Packaging Film	0.1%	0.0%	15,254

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Film Products	0.6%	0.2%	66,939
Flexible Plastic Pouches	0.0%	0.0%	3,595
Other Film	2.2%	0.4%	256,652
Durable Plastic Items	0.8%	0.1%	88,476
Remainder/Composite Plastic	0.3%	0.1%	38,319
Total Electronics	**0.5%**		**53,724**
Large Equipment	0.2%	0.1%	28,883
Consumer Electronics and Small Equipment	0.2%	0.1%	20,967
Covered Video Display Devices	0.0%	0.0%	3,874
Total Organic	**32.5%**		**3,769,129**
Food - Potentially Donatable - Vegetative	0.1%	0.0%	14,488
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.0%	0.0%	2,502
Food - Potentially Donatable - Animal Meat	0.0%	0.0%	4,334
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.0%	0.0%	3,356
Food - Potentially Donatable - Packaged Non-perishable	0.0%	0.0%	4,120
Food - Not Donatable - Meat	0.2%	0.0%	17,952
Food - Not Donatable - Non-meat	1.3%	0.2%	150,869
Food - Inedible	0.4%	0.1%	41,274
Leaves and Grass	2.2%	0.4%	251,139
Prunings and Trimmings	4.0%	0.6%	462,830
Branches and Stumps	3.1%	0.5%	359,278
Manures	0.0%	0.0%	0
Clean Dimensional Lumber	3.7%	0.5%	426,838
Clean Engineered Wood	4.5%	0.6%	517,807
Clean Pallets and Crates	1.9%	0.3%	224,092
Wood Waste - Treated/Painted/Stained	10.2%	0.8%	1,189,006
Other Recyclable Wood	0.0%	0.0%	0
Remainder/Composite Organic	0.9%	0.3%	99,242
Total Inerts and Others	**36.3%**		**4,215,996**
Concrete	4.1%	0.6%	474,633
Asphalt Paving	0.0%	0.0%	5,028
Asphalt Roofing	5.5%	0.8%	634,631
Gypsum Board	5.3%	0.7%	610,830
Carpet	2.4%	0.5%	281,950
Rock, Soil and Fines	7.2%	0.8%	832,694
Remainder/Composite Inerts and Other	11.9%	1.1%	1,376,230

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total HHW	**0.1%**		**5,854**
Paint	0.0%	0.0%	0
Used Oil	0.0%	0.0%	0
Lead-acid (Automotive) Batteries	0.0%	0.0%	0
Other Batteries	0.0%	0.0%	1,380
One-Pound Propane Gas Cylinders	0.0%	0.0%	0
Pharmaceuticals	0.0%	0.0%	0
Remainder/Composite Household Hazardous	0.0%	0.0%	4,473
Total Special Waste	**14.6%**		**1,694,419**
Tires	0.3%	0.2%	29,392
Bulky Items	13.7%	1.2%	1,595,222
Mattresses and Foundations	0.6%	0.2%	69,806
Remainder/Composite Special Waste	0.0%	0.0%	0
Total Miscellaneous	**1.4%**		**160,625**
Textiles - Organic	0.3%	0.1%	35,252
Textiles - Synthetic, Mixed, Unknown	0.3%	0.1%	40,263
Textiles - Shoes, Purses, Belts	0.1%	0.0%	6,084
Solar Panels	0.0%	0.0%	150
Diapers and Sanitary Products	0.0%	0.0%	656
Remainder/Composite Organic - Non-compostable	0.2%	0.1%	21,536
Mixed Residue	0.3%	0.1%	37,702
MRF Residual Fines	0.0%	0.0%	0
Miscellaneous Inorganics	0.2%	0.0%	18,983
Total	**100.0%**		**11,604,521**
Sample Count	**449**		

Table 13. Accessible Table of Composition of California's Overall Disposed Waste Stream – SB 1383-related Materials

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total Paper	**16.6%**		**6,525,762**
Uncoated Corrugated Cardboard	5.2%	0.2%	2,037,360
Paper Grocery Bags	0.1%	0.0%	29,248
Other Paper Bags/Kraft Paper	0.4%	0.0%	159,212
Newspapers/Newspaper Inserts	0.7%	0.1%	276,453
White Office-type Paper and Mail	0.4%	0.1%	156,662
Magazines and Catalogs	0.4%	0.0%	161,958
Folding Cartons and Other Paperboard Packaging	1.2%	0.0%	457,564
Other Recyclable Paper	1.4%	0.1%	559,779
Miscellaneous Paper Packaging	0.9%	0.1%	352,975
Aseptic Containers	0.1%	0.0%	28,002
Gable-top Cartons	0.1%	0.0%	46,766
Compostable Paper - Packaging	1.3%	0.1%	515,393
Compostable Paper - Non-packaging	3.9%	0.1%	1,531,324
Remainder/Composite Paper - Other	0.5%	0.1%	213,067
Total Organic	**34.1%**		**13,397,041**
Food - Potentially Donatable - Vegetative	1.5%	0.2%	577,303
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.2%	0.0%	69,497
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	84,608
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.4%	0.1%	153,255
Food - Potentially Donatable - Packaged Non-perishable	0.6%	0.1%	232,584
Food - Not Donatable - Meat	1.1%	0.1%	436,986
Food - Not Donatable - Non-meat	9.5%	0.3%	3,752,620
Food - Inedible	1.4%	0.1%	552,682
Leaves and Grass	2.3%	0.2%	905,885
Prunings and Trimmings	3.1%	0.3%	1,221,926
Branches and Stumps	1.5%	0.2%	608,127
Manures	0.6%	0.2%	254,093
Clean Dimensional Lumber	2.0%	0.2%	802,353
Clean Engineered Wood	2.2%	0.2%	875,510
Clean Pallets and Crates	2.2%	0.2%	872,840
Wood Waste - Treated/Painted/Stained	4.4%	0.3%	1,740,699
Other Recyclable Wood	0.0%	0.0%	13,824
Remainder/Composite Organic	0.6%	0.1%	242,248

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total Inerts and Others	**1.6%**		**627,926**
Carpet	1.6%	0.2%	627,926
Total Miscellaneous	**3.4%**		**1,346,976**
Textiles - Organic	1.1%	0.1%	434,956
Textiles - Synthetic, Mixed, Unknown	1.6%	0.1%	644,473
Textiles - Shoes, Purses, Belts	0.3%	0.0%	120,032
Remainder/Composite Organic - Non-compostable	0.4%	0.1%	147,514
Total	**55.7%**		**21,897,706**
Sample Count	**892**		

Table 14. Accessible Table of Composition of California's Overall Disposed Waste Stream – AB 1826-related Materials

Material	Estimated Percent (2018)	+/-	Estimated Tonnage (2018)
Total Organic	**28.2%**		**11,146,176**
Food - Potentially Donatable - Vegetative	1.5%	0.2%	577,303
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.2%	0.0%	69,497
Food - Potentially Donatable - Animal Meat	0.2%	0.0%	84,608
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.4%	0.1%	153,255
Food - Potentially Donatable - Packaged Non-perishable	0.6%	0.1%	232,584
Food - Not Donatable - Meat	1.1%	0.1%	436,986
Food - Not Donatable - Non-meat	9.5%	0.3%	3,752,620
Food - Inedible	1.4%	0.1%	552,682
Leaves and Grass	2.3%	0.2%	905,885
Prunings and Trimmings	3.1%	0.3%	1,221,926
Branches and Stumps	1.5%	0.2%	608,127
Clean Dimensional Lumber	2.0%	0.2%	802,353
Clean Engineered Wood	2.2%	0.2%	875,510
Clean Pallets and Crates	2.2%	0.2%	872,840
Total	**28.2%**		**11,146,176**
Sample Count	**892**		

Table 15. Accessible Table of Material Composition of MRF Residual Waste

Material	Estimated Percent (Mixed Waste; 2018)	Estimated Percent (Clean Recyclables; 2018)	Estimated Percent (Organics Processing; 2018)	Estimated Percent (C&D; 2018)
Total Paper	**23.8%**	**28.9%**	**7.0%**	**6.0%**
Uncoated Corrugated Cardboard	4.7%	4.6%	2.2%	3.3%
Paper Grocery Bags	0.1%	0.2%	0.0%	0.0%
Other Paper Bags/Kraft Paper	0.7%	0.5%	0.7%	0.0%
Newspapers/Newspaper Inserts	0.3%	0.5%	0.2%	0.0%
White Office-type Paper and Mail	0.3%	0.7%	0.3%	0.1%
Magazines and Catalogs	0.5%	1.5%	0.3%	0.0%
Folding Cartons and Other Paperboard Packaging	1.0%	3.1%	0.6%	0.1%
Other Recyclable Paper	2.4%	6.6%	1.1%	0.9%
Miscellaneous Paper Packaging	0.9%	0.9%	0.3%	0.1%
Aseptic Containers	0.1%	0.2%	0.0%	0.0%
Gable-top Cartons	0.2%	0.5%	0.1%	0.0%
Compostable Paper - Packaging	2.2%	2.1%	0.2%	0.3%
Compostable Paper - Non-packaging	9.6%	5.7%	0.7%	0.7%
Remainder/Composite Paper - Other	0.8%	1.8%	0.3%	0.5%
Total Glass	**0.5%**	**1.9%**	**0.0%**	**0.2%**
Clear Glass Bottles and Containers - CRV	0.1%	0.5%	0.0%	0.0%
Clear Glass Bottles and Containers - Non-CRV	0.2%	0.3%	0.0%	0.0%
Green Glass Bottles and Containers - CRV	0.0%	0.2%	0.0%	0.0%
Green Glass Bottles and Containers - Non-CRV	0.1%	0.4%	0.0%	0.0%
Brown Glass Bottles and Containers - CRV	0.0%	0.2%	0.0%	0.0%

Material	Estimated Percent (Mixed Waste; 2018)	Estimated Percent (Clean Recyclables; 2018)	Estimated Percent (Organics Processing; 2018)	Estimated Percent (C&D; 2018)
Brown Glass Bottles and Containers - Non-CRV	0.0%	0.1%	0.0%	0.0%
Other Colored Glass Bottles and Containers	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	0.0%	0.2%	0.0%	0.2%
Total Metal	**2.3%**	**4.7%**	**1.6%**	**3.8%**
Remainder/Composite Metal	0.2%	1.8%	0.4%	0.1%
Other Ferrous	0.1%	0.1%	0.0%	0.1%
Aluminum Cans - CRV	0.6%	1.0%	0.4%	2.5%
Tin/Steel Cans	0.1%	0.5%	0.2%	0.1%
Major Appliances	0.0%	0.1%	0.0%	0.0%
Aluminum Cans - Non-CRV	0.9%	0.6%	0.4%	0.8%
Other Non-Ferrous	0.4%	0.6%	0.2%	0.3%
Total Plastic	**20.2%**	**33.3%**	**9.9%**	**13.2%**
PETE Containers - CRV	0.4%	0.7%	0.6%	0.1%
PETE Containers - Non-CRV	0.2%	1.1%	0.1%	0.0%
PETE Containers, Lids, and other Packaging	0.8%	1.9%	0.1%	0.0%
HDPE Containers - CRV	0.0%	0.0%	0.0%	0.0%
HDPE Containers - Non-CRV	0.4%	1.6%	0.4%	0.1%
HDPE Containers, Lids, and other Packaging	0.0%	0.4%	0.0%	0.0%
Polypropylene Containers and Packaging	1.1%	2.4%	0.5%	0.1%
Other Plastic Containers and Packaging	0.8%	2.9%	0.3%	0.1%
Expanded Polystyrene Packaging	0.4%	1.0%	0.2%	0.1%
Plastic Trash Bags	1.7%	1.3%	0.5%	0.2%
Plastic Grocery and Other Merchandise Bags	0.5%	0.6%	0.2%	0.0%

Material	Estimated Percent (Mixed Waste; 2018)	Estimated Percent (Clean Recyclables; 2018)	Estimated Percent (Organics Processing; 2018)	Estimated Percent (C&D; 2018)
Non-Bag Commercial and Industrial Packaging Film	0.4%	0.8%	0.4%	2.5%
Film Products	0.1%	0.2%	0.1%	0.1%
Flexible Plastic Pouches	0.0%	0.1%	0.0%	0.0%
Other Film	9.7%	9.2%	3.4%	1.6%
Durable Plastic Items	2.0%	6.9%	2.5%	3.8%
Remainder/Composite Plastic	1.6%	2.2%	0.6%	4.2%
Total Electronics	**0.4%**	**1.3%**	**0.2%**	**0.4%**
Large Equipment	0.1%	0.2%	0.0%	0.0%
Consumer Electronics and Small Equipment	0.3%	1.1%	0.2%	0.1%
Covered Video Display Devices	0.0%	0.0%	0.0%	0.3%
Total Organic	**14.3%**	**4.9%**	**51.1%**	**26.7%**
Food - Potentially Donatable - Vegetative	0.4%	0.1%	0.0%	0.0%
Food - Potentially Donatable - Eggs, Dairy, and Dairy Alternatives	0.1%	0.0%	0.0%	0.0%
Food - Potentially Donatable - Animal Meat	0.1%	0.0%	0.0%	0.0%
Food - Potentially Donatable - Cooked/Baked/Prepared Perishable Items	0.1%	0.0%	0.1%	0.0%
Food - Potentially Donatable - Packaged Non-perishable	0.2%	0.1%	0.0%	0.0%
Food - Not Donatable - Meat	0.3%	0.1%	0.1%	0.1%
Food - Not Donatable - Non-meat	3.3%	1.0%	0.4%	0.6%
Food - Inedible	0.5%	0.1%	0.0%	0.0%
Leaves and Grass	0.3%	0.0%	2.4%	0.1%
Prunings and Trimmings	1.1%	0.0%	26.8%	0.8%

Material	Estimated Percent (Mixed Waste; 2018)	Estimated Percent (Clean Recyclables; 2018)	Estimated Percent (Organics Processing; 2018)	Estimated Percent (C&D; 2018)
Branches and Stumps	0.4%	0.1%	13.3%	0.2%
Manures	0.0%	0.0%	0.0%	0.0%
Clean Dimensional Lumber	0.7%	0.4%	1.0%	6.9%
Clean Engineered Wood	1.9%	0.3%	1.5%	8.7%
Clean Pallets and Crates	1.1%	0.2%	0.2%	1.4%
Wood Waste - Treated/Painted/Stained	2.5%	2.4%	4.4%	6.6%
Other Recyclable Wood	0.8%	0.0%	0.5%	1.3%
Remainder/Composite Organic	0.4%	0.1%	0.5%	0.0%
Total Inerts and Others	**7.0%**	**3.0%**	**11.9%**	**22.5%**
Concrete	0.8%	0.4%	7.4%	7.1%
Asphalt Paving	0.0%	0.0%	0.1%	0.0%
Asphalt Roofing	0.7%	0.0%	0.1%	2.7%
Gypsum Board	0.2%	0.0%	0.1%	5.3%
Carpet	1.3%	0.1%	0.5%	1.0%
Rock, Soil and Fines	0.4%	0.1%	1.4%	0.8%
Remainder/Composite Inerts and Other	3.5%	2.4%	2.4%	5.5%
Total HHW	**0.3%**	**0.3%**	**0.0%**	**0.2%**
Paint	0.0%	0.1%	0.0%	0.1%
Used Oil	0.0%	0.0%	0.0%	0.0%
Lead-acid (Automotive) Batteries	0.0%	0.0%	0.0%	0.0%
Other Batteries	0.0%	0.1%	0.0%	0.0%
One-Pound Propane Gas Cylinders	0.0%	0.0%	0.0%	0.0%
Pharmaceuticals	0.1%	0.0%	0.0%	0.0%

Material	Estimated Percent (Mixed Waste; 2018)	Estimated Percent (Clean Recyclables; 2018)	Estimated Percent (Organics Processing; 2018)	Estimated Percent (C&D; 2018)
Remainder/Composite Household Hazardous	0.2%	0.1%	0.0%	0.1%
Total Special Waste	**2.7%**	**1.7%**	**1.3%**	**16.5%**
Tires	0.1%	0.1%	0.1%	0.0%
Bulky Items	2.5%	1.6%	1.2%	16.4%
Mattresses and Foundations	0.1%	0.0%	0.0%	0.1%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Total Miscellaneous	**28.5%**	**20.1%**	**17.0%**	**10.5%**
Textiles - Organic	1.1%	0.7%	0.8%	0.2%
Textiles - Synthetic, Mixed, Unknown	4.8%	2.1%	3.0%	0.8%
Textiles - Shoes, Purses, Belts	0.9%	0.7%	0.4%	0.1%
Solar Panels	0.0%	0.0%	0.0%	0.0%
Diapers and Sanitary Products	3.4%	0.5%	0.5%	0.1%
Remainder/Composite Organic - Non-compostable	0.7%	0.3%	0.6%	0.1%
Mixed Residue	0.3%	0.0%	0.0%	0.1%
MRF Residual Fines	16.8%	15.3%	11.6%	9.0%
Miscellaneous Inorganics	0.4%	0.5%	0.0%	0.0%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Sample Count	**76**	**38**	**38**	**49**