

# Hoopa Valley Indian Tribe Waste Assessment

## Introduction

The Hoopa Valley Indian Tribe (Hoopa) waste assessment was conducted on October 23, 2018, as part of a workshop sponsored by Hoopa and U.S. Environmental Protection Agency (U.S. EPA) to support tribal communities in waste management efforts. The day-long training covered a variety of topics including the potential uses of waste characterization data as well as the design and execution of an effective waste sort. The training took place in the conference room at the Hoopa-owned Tsewenaldin Inn at 12482 Highway 96, in Hoopa, California. The waste assessment was conducted in a paved open area at the Hoopa Transfer Station at 11900 Highway 96, in Hoopa, California.

Hoopa's goals for the waste assessment were to gather data to: (1) evaluate the types of wastes disposed from residential areas, (2) evaluate overall waste management practices, (3) evaluate potential future recycling options with their waste hauler, Humboldt Waste Management, and (4) identify opportunities for waste reduction and diversion efforts. Hoopa is interested in finding better options for disposing of household hazardous waste (HHW), but that was not the primary focus of this waste assessment.

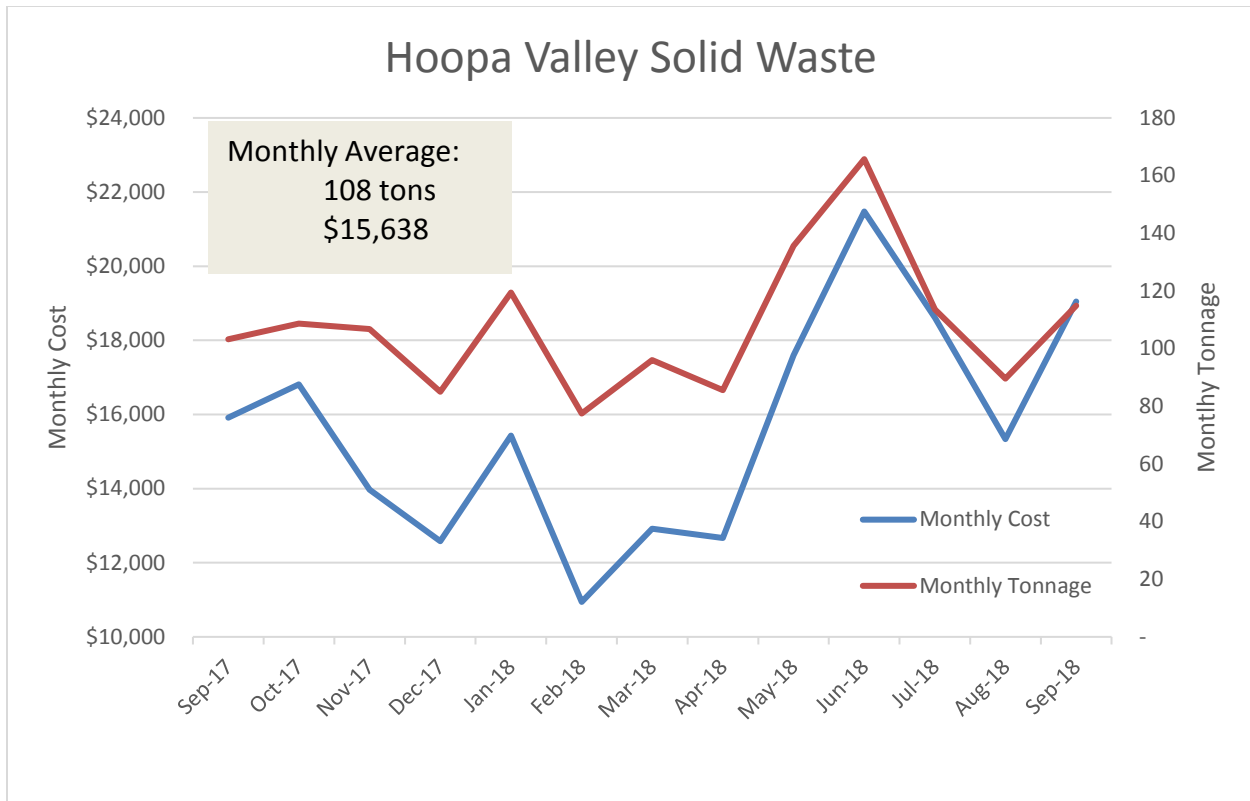
## Waste Management

Prior to the waste assessment, Hoopa completed a pre-assessment questionnaire and also provided additional information by phone and email which is summarized below:

### Hoopa Waste Management Summary

<p><b><i>Community Summary and Waste Management</i></b></p>	<p><b>Population:</b> 3,346 residents on Hoopa Tribal areas</p> <p><b><u>Residential waste:</u></b></p> <ul style="list-style-type: none"> <li>• Residential waste is managed at the Hoopa Transfer Station which is open Friday through Tuesday and closed Wednesday, Thursday, and on major holidays.</li> <li>• According to the 2016 Hoopa Solid Waste Management Plan (SWMP), Hoopa annually generates approximately 1,220 tons of waste, recyclable and recoverable materials. Data provided by Hoopa PUD for the most recent 12 months total 1,298 tons so waste generation is stable.</li> <li>• The transfer station manages the waste stream with four 40-yard bins supplied by Humboldt Waste Sanitation which hauls the bins weekly to a landfill near Eureka about 60 miles away.</li> <li>• Tom's Trash in Willowcreek 12 miles south of Hoopa provides curbside pickup to residents willing to pay for the service which is more expensive than self-haul to the transfer station. Most residents opt for self-haul.</li> <li>• As of October 2018, tipping fees at the Hoopa Transfer Station for residents increased from \$0.14 to \$0.15 per pound, as measured on a scale at transfer station.</li> </ul>
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	<ul style="list-style-type: none"> <li>• Approximately 80% of residential self-hauling waste is delivered 30-gallon bags to the Hoopa Valley Transfer Station.</li> <li>• Hoopa does not currently provide routine recycling or composting for residential waste, but does accept scrap metal, and tires at \$0.11 per pound.</li> <li>• Residents can dispose of excess trash plus white goods and other larger items free via certain community events like household dump days. Community events seem to encourage waste stockpiling by some residents, increasing issues with vector, nuisance, blight, and child safety.</li> <li>• As Hoopa started to charge residents for waste disposal, illegal dumping increased, and the tribal administrations has increased monitoring and often pursued fines successfully. Also, without easy and inexpensive or free disposal, the residential areas have seen an increase in abandoned vehicles.</li> </ul> <p><b><u>Tribal operations:</u></b></p> <ul style="list-style-type: none"> <li>• Commercial businesses pay a local waste hauler, Tom’s Trash, to haul waste to Sugar Bowl transfer station.</li> <li>• The Hoopa EPA office and other Tribal entities dispose of waste by separate contract with the Hoopa Tribal Plant Management Department.</li> </ul>
<p><b><i>Potential Activities</i></b></p>	<ul style="list-style-type: none"> <li>• Complete an analysis of the total cost of the solid waste program and unit cost per household per year (see below). Revise the calculations over time to better inform diversion efforts and justify tribal budgetary support for solid waste management. U.S. EPA’s Solid Waste Costing Tool could provide additional guidance on calculations.</li> <li>• Update tribal (SWMP) including documenting operational methods and identify projects to improve diversion.</li> <li>• The 2016 SWMP includes a waste diversion goal of 20%. In addition to that overall goal, set more specific diversion goals by targeting priority waste stream components based on value, weight, bulk and ease of separation or diversion.</li> <li>• Evaluate potential collaboration with commercial operations at Hoopa to divert commercial waste from the gas station/convenience store, casino (currently closed), motel, and grocery store (under construction). Target recyclables in commercial waste that are easier to separate, like corrugated cardboard, California Redemption Value (CRV), and green waste. Options for commercial backhaul of cardboard and other commodities can be evaluated.</li> </ul>
<p><b><i>Past Studies/Data</i></b></p>	<ul style="list-style-type: none"> <li>• Hoopa has not previously performed a solid waste characterization study.</li> <li>• Hoopa did provide monthly data on residential waste generation for the prior 13 months from September 2017 to September 2018 plotted in the chart below. Monthly average cost is \$15,638 and monthly generation is 108 tons with significant increases during the post-holiday and summer months.</li> </ul>



### Waste Sort Methodology:

The waste sort was conducted as part of a workshop covering various aspects and challenges of completing an accurate and practical waste characterization. The waste sort was designed to also address a wide range of circumstances attendees from surrounding tribes might encounter doing their own waste sort. Part of this effort was to encounter implementation challenges and discuss and modify the methodology as needed.

The waste sort was completed by 24 people including representatives from Hoopa (Environmental Protection Agency, Public Utility District [PUD], and CCC), six area tribes (Karuk Tribe, Enterprise Rancheria, Resighini Rancheria, Elia Valley Rancheria, Elk Valley Rancheria, and Quartz Valley Indian Rancheria), U.S. EPA Region 10, and U.S. EPA Region 9 and its contractor. The Hoopa Environmental Department worked with the Transfer Station and Hoopa PUD to collect, deliver and manage the waste.

Though several potential distinct waste streams including from various commercial operations were considered, the waste characterization focused on residential waste from a 40-yard bin. PUD staff removed approximately 20% of the waste from one 40-yard bin with a backhoe loader and spread the waste in an adjacent paved area. A total of 1,788 pounds of waste was sorted manually.

The waste sort was completed as follows:

- Hoopa PUD emptied a portion of the 40-yard bin onto a paved area at the Transfer Station.
- Workshop attendees conducted waste sorting and weighing for approximately 2.5 hours including preparation and cleanup.
- A total of 1,788 pounds of residential waste was removed from the 40-yard bin and sorted. Based

on the experience of staff from Hoopa PUD and Hoopa EPA, the waste collected for the waste characterization was representative of the overall residential waste profile.

- Both the amount of trash and the following “divertable” materials were separated into the following categories and weighed as part of the waste characterization:
  - Metal (e.g., food cans, foil, pie pans)
  - Glass
  - CRV Glass, Plastic, and Aluminum
  - Mixed Paper/Paperboard
  - Corrugated Cardboard
  - Recyclable Plastics (#1-7)
  - Household Hazardous Waste (HHW) (e.g., cleaning products, automotive fluids)
  - e-Waste
  - Reusable (items suitable for donation to a thrift shop)
  - Residual Waste: everything not listed above (mainly food waste, other organics, non-recyclable plastics, etc.)
- Contamination of recyclables was considered relative to whether an item was recyclable at the point of generation. If the contamination appeared to have occurred prior to being placed in the garbage (e.g., a pizza box with grease or cheese, or a partially full peanut butter jar), it was considered trash and not counted with the recyclables.
- Other problematic waste streams like electronic waste and household hazardous waste were separated for proper disposal.

## Waste Assessment Results

The characterization of Hoopa’s residential waste yielded both quantitative data and subjective conclusions supported by visual observations. The waste characterization occurred on a single day in a year, so it may not be representative, though there were no apparent anomalies such as building or construction debris, commercial waste, or other unusual concentrations of a single type of waste. Several figures are provided below summarizing the waste characterization data (the Excel spreadsheet containing Hoopa’s waste data is provided with this report):

**Figure 1 – Current and Potential Diversion Rates:** Waste sort data was entered in the yellow-shaded cells and the corresponding percentage of the total waste was calculated.

**Figure 2 – Waste Characterization Results:** The pie chart shows the percentages of both waste and recyclables in the materials used for the waste sort, and therefore identifies the amount of additional recycling and diversion that can be accomplished with additional separation.

**Figure 3 – Divertible Waste: Recyclable:** The pie chart shows a closer look at just the “divertible” portion of the waste stream and the relative percentages of each.

The waste sort included approximately 20% of one of the four 40-yard bins removed weekly from the transfer station. Based on that estimate, the waste sort covered approximately 5% of the weekly residential generation. Though this waste sort provides a snapshot of the typical waste stream, the waste sorted is likely a representative sample from which to extrapolate data and make observations of the residential waste stream. Because much of the residential waste was not evaluated, decisions on capital expenditures or operational changes should not be made without further waste characterization data. For example, additional waste data could be gathered from a second similar waste sort conducted during summer months when, according to PUD, Hoopa residents generate more waste, and then supplemented by four spot checks using visual estimations throughout the year.

A review of the pre-assessment questionnaire, visual assessments, and the waste sort data resulted in the following observations:

- Each resident generates approximately 14 pounds of waste per week (2 pounds per day).
- Of the divertable materials sorted (excluding two dense waste streams: food waste and green waste), more than 22% of material sorted was divertable.
- Of the divertable component that was sorted, approximately:
  - 27% was non-CRV glass.
  - 22% was considered suitable for donation for resale.
  - 18% was corrugated cardboard.
  - 14% was e-waste or HHW.
  - 6% was CRV beverage containers and redeemable for income.
- Notably, no syringes or other medical wastes like transfusion tubing or other supplies for treating diabetes were observed during the waste sort. Such materials have been frequently identified at other tribal waste characterizations.

## Solid Waste Management Costs:

Determining the total cost of providing solid waste management could help Hoopa in making decisions about various diversion and recycling options. Hoopa PUD provided the data in the table below:

### Summary of Annual Solid Waste Management Program Costs

Cost Category	\$/year	Detail
Transfer Station (Wages + Benefits)	\$84,500	2 workers (dump attendant, dump supervisor); total 80 hours/week; 45% fringe benefits
Tribal Management (Wages + Benefits)	\$10,000	Estimated 5 hours/week; 45% fringe benefits
Transfer Station Equipment (backhoe, excavator)	\$10,000	Estimated including depreciation, maintenance, and fuel
Office Supplies	\$1,000	Waste tickets
Utilities	\$3,600	Electricity
Landfill Tipping Fee	\$ 182,800	Waste transport and disposal fee to Humboldt Waste Management – last 12 months
Hauling	\$4,500	
<b>Total Cost</b>	<b>\$296,400</b>	
Income Category	\$/year	Detail
Residential Tipping Fees	\$363,400	1,298 tons annually at \$0.14 per pound (changed to \$.015 in October 2018)
CRV	\$0	Not currently recycled
Cardboard	\$0	
Glass	\$0	
Mixed Paper	\$0	
Newspaper	\$0	
e-Waste	\$0	
Aluminum	\$0	
Plastic	\$0	
Vehicle Batteries	\$0	
<b>Total</b>	<b>\$363,400</b>	
<b>Net Cost/Revenue</b>	<b>+\$67,000</b>	
<b>Net Unit Cost/Revenue (\$/ton)</b>	<b>+\$51.62</b>	Approximately 1,298 residential tons annually including both landfill and recyclables

In addition to the direct costs listed above for operating a solid waste management program, additional costs including the future rehabilitation of the HHW disposal area as well as the original siting and construction of the transfer station. Presumably, a significant portion of those costs are covered with the tribal funds in support of revenue received from resident tipping fees. Consequently, any revenue from diversion activities are cost savings to the tribe.

The environmental benefits from diversion can be varied and hard to estimate as they can occur far up the supply chain as well as in different states and even countries. A good proxy for those benefits are greenhouse gas (GHG) emissions. The U.S. EPA has created and maintained a tool to estimate the impacts from various waste management decisions. The U.S. EPA's Waste Reduction Model (WARM) calculates total GHG emissions of baseline and alternative waste management practices including source reduction, recycling, combustion, composting, anaerobic digestion and landfilling. The model calculates emissions across a wide range of material types commonly found in municipal solid waste in:

- Metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E),
- Metric tons of carbon equivalent (MTCE), and
- Energy units (million British thermal unit [BTU]).

WARM is available as a downloadable Microsoft Excel spreadsheet at [www.epa.gov/warm](http://www.epa.gov/warm).

## Conclusions/Recommendations:

### Waste Characterization:

- Based on the waste characterization of just the sorted residential materials, 23% is divertable either to be recycled or donated. Currently, this material is all landfilled.
  - The current residential waste is comprised of conventional recycling commodities (e.g., CRV beverage containers, aluminum, plastics #1-7, glass, corrugated cardboard, and paper/paperboard) that could either be source separated with curbside recycling or separated at the transfer station. Both curbside recycling and separation at the transfer station would require significant materials and/or labor.
  - The waste sort did not allow us to identify visually significant amounts of green waste or food waste, though more data might reveal those compostable waste streams as a large diversion opportunity.
- ✓ ***Hoopa already has "Pay-As-You-Throw" (PAYT) with charging by weight at the transfer station which can incentivize residential diversion and reduction of waste. Discussions and/or negotiation with the waste hauler to incorporate weight into the cost structure could yield savings for the tribe. PAYT aligns incentives for both residential customers and the waste hauler and can lower waste management costs for both. See <https://archive.epa.gov/wastes/conserve/tools/payt/web/html/index.html> for additional information.***

### Diversion:

- Common recycling commodities (e.g., aluminum, glass, paperboard, and plastics, CRV, reusable) represent significant amounts (23% of sorted materials) of Hoopa's residential waste stream and could be separated at the source or at the transfer station. The Hoopa Transfer Station does not currently have equipment or a program to accept common recyclables.

- A large number of reusable items suitable for donation were found and which extrapolated to annual amounts would total 2-3 tons of materials that could benefit residents and be diverted from the landfill.
- ✓ ***The 2016 SWMP includes a waste diversion goal of 20%. Residential diversion efforts should focus on setting more specific diversion goals by targeting priority waste stream components based on value, weight, bulk, environmental impact, and ease of separation or diversion.***
- ✓ ***Evaluate opportunities for potential collaboration with commercial operations at Hoopa to divert both residential and commercial waste streams. Potential commercial partners include the gas station/convenience store, casino (currently closed), motel, and grocery store (under construction). Target recyclables common in both residential and commercial waste that are easier to separate like glass, corrugated cardboard, and CRV.***

**Problematic Wastes:**

- Household Hazardous Waste (HHW): Household cleaners, solvents, and automobile chemicals were found in the waste stream indicating residents likely need better options for disposing of HHW correctly including regular HHW events.
- Waste sort data indicates that relatively small but not insignificant amounts of e-waste were found in the residential waste.
- ✓ ***Continue promoting the proper disposal and recycling of problematic items at the Transfer Station. Efforts should address HHW, white goods, vehicle batteries and parts, and e-waste.***
- ✓ ***Monitor and anticipate increased e-waste generation.***

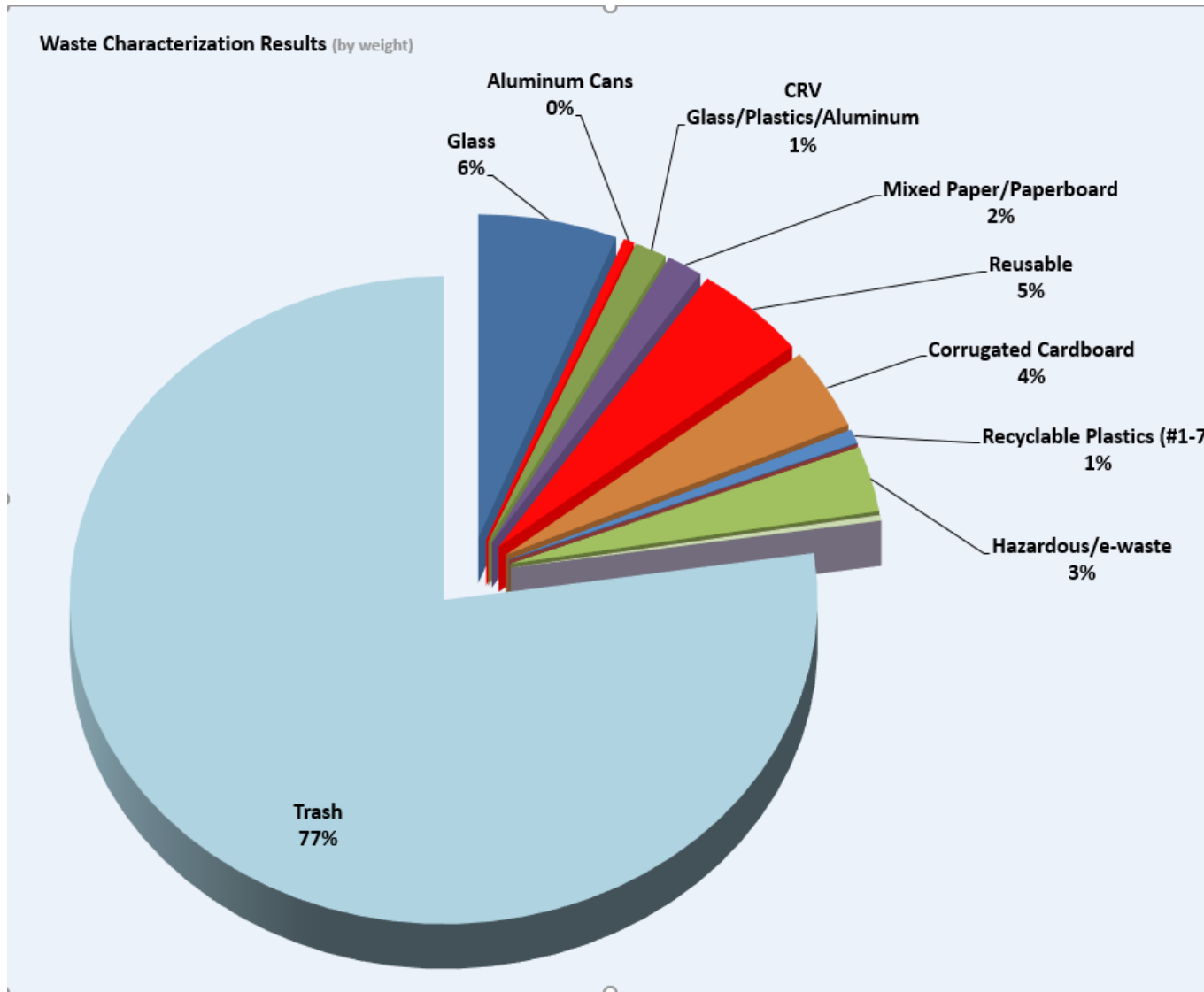


**Figure 1: Current Recyclables**  
**October 2018: Hoopa Waste Characterization: Residential**

Material	Waste Sort Quantity (lbs)	Weekly Quantity (lbs/wk)	Annual Quantity (tons/yr)	Percentage of Waste
	5.00%	[C / 77%]	[C X 52 / 2000 lb]	
<b>Recyclable</b>				
Glass	107.5	2150.0	55.90	6.0%
Aluminum Cans	8.0	160.0	4.16	0.4%
CRV Glass/Plastics/Aluminum	25.0	500.0	13.00	1.4%
Mixed Paper/Paperboard	28.0	560.0	14.56	1.6%
Reusable	88.5	1770.0	46.02	4.9%
Corrugated Cardboard	72.5	1450.0	37.70	4.1%
Recyclable Plastics (#1-7)	12.5	250.0	6.50	0.7%
CRV Plastic		0.0	0.00	0.0%
Hazardous/e-waste	58.5	1170.0	30.42	3.3%
<b>Total Recyclable</b>		<b>8,010.0</b>	<b>208.26</b>	<b>22.4%</b>
<b>Compostable</b>				
Green Waste	0.0	0.0	0.00	0.0%
Food Waste		0.0	0.00	0.0%
Compostable Food Packaging		0.0	0.00	0.0%
Other Compostable Material		0.0	0.00	0.0%
<b>Total Compostable</b>		-	-	<b>0.0%</b>
<b>Non-Divertable</b>				
Non-Compostable Food Packaging	0.0	0.0	0.00	0.0%
Clothes	5.0	100.0	2.60	0.3%
Non-Recyclable Plastics	0.0	0.0	0.00	0.0%
Trash	1382.5	27650.0	718.90	77.3%
<b>Total Non-Divertable</b>		<b>27,750.0</b>	<b>721.50</b>	<b>77.6%</b>
<b>Totals</b>	<b>1,788</b>	<b>35,760</b>	<b>929.76</b>	<b>100%</b>
<b>Landfilled</b>		<b>929.76</b>	<b>[tons/year]</b>	
<b>Currently Diverted</b>		-	<b>[tons/year]</b>	
<b>Additional Potentially Diverted</b>		208.26	<b>[tons/year]</b>	
<b>Total Potentially Diverted</b>		208.26	<b>[tons/year]</b>	<b>22%</b>

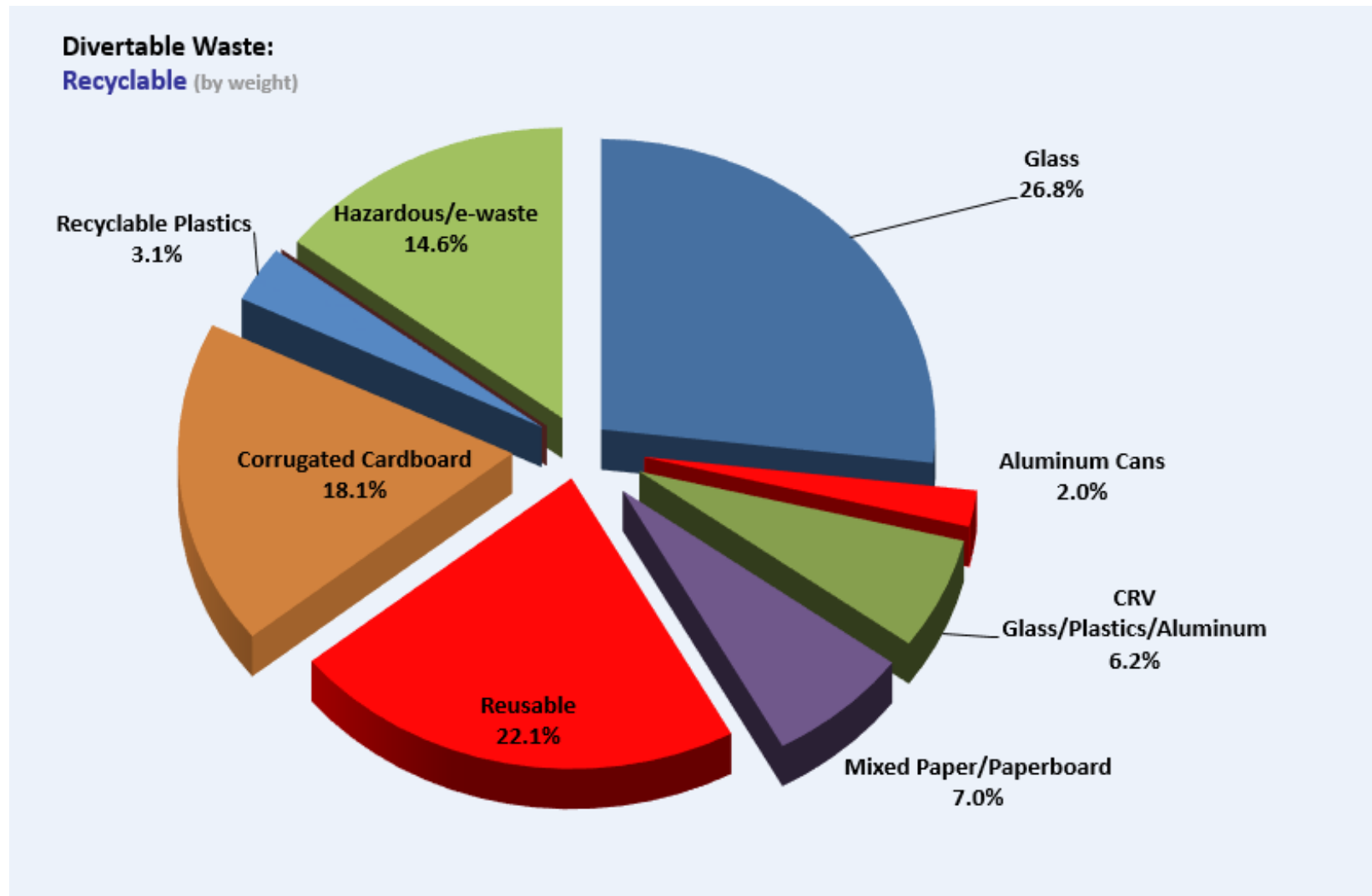
## Figure 2: Waste Characterization Results (by weight)

October 2018: Hoopa Waste Characterization: Residential



### Figure 3: Divertible Waste - Recyclable (percent of total divertible stream)

October 2018: Hoopa Waste Characterization: Residential





*Photo 1: Initial load of residential waste staged for sorting.*



*Photo 2: Loader removing waste from 40-yard bin.*



Photo 3: Active sorting



Photo 4: Data recording



*Photo 5: Active sorting*



*Photo 6: Waste component identification*

