

Material Recovery Facility Waste Characterization Study Report

April 17, 2019

STATEMENT OF WORK

Bridging The Gap (BTG), a 501c3 environmental organization, assisted Waste Management and the City of Overland Park, KS in performing a solid waste characterization study of the Waste Management (WM) material recovery facility (MRF) at 2404 S 88th St, Kansas City, KS. The purpose of the study is to determine the composition and quantity of materials being recycled by type (aluminum, steel, cardboard, office paper, plastic, etc.) and contaminants by type by single family residential generators. The study results will be used to target contaminant streams in future education initiatives.

SUMMARY

The total sample size was 1,763.60 pounds, of which recycling amounted to 1,274.50 pounds, non-detrimental contaminants weighed 289.40 pounds and detrimental contaminants weighed 199.70 pounds. The recycling facility audit indicated that 27.73% of the Overland Park, KS residential curbside recycling stream sample was contamination, the majority of which was bagged recycling (9.96%) and contaminated paper (4.58%).

The audit identified opportunities to decrease contamination and increase recycling, i.e. educate on not bagging recycling and recycling glass, scrap metal, electronics, plastic film, textiles and hazardous waste at appropriate locations. This would decrease the contamination rate to 12.44%.

METHODOLOGY

WM agreed to collect one rear-load truckload from Overland Park, KS residential routes occurring on Monday or Tuesday prior to the audit. As Overland Park is an open market city, the one truck collected material from a large portion of the city. Because the audit was performed inside the MRF, all staff and volunteers were required to wear safety vests, glasses, hard hats and appropriate clothing and footwear. The volunteers were divided into two groups and sorted five samples each. The samples were taken from the top, sides and the inside or bottom of the load to guarantee a good mixture of all areas of the route.

The audit was conducted the morning of Wednesday, April 17 by four staff and 12 volunteers and took approximately 4 hours. The audit was supervised by Michelle Martin with WM and Cassandra Ford with BTG.

BTG prepared the tracking spreadsheet based on contaminants found during Johnson County's curbside recycling audit as well as The Recycling Partnership's MRF audit checklist. Samples were sorted into recyclable categories of cardboard





(OCC), paper, aluminum/steel and plastic (PET #1, HDPE #2, PP #5); non-detrimental contaminant categories of contaminated paper, glass, scrap metal, organics (food, yard waste), EPS (Styrofoam in any form), all non-recyclable plastics, construction & demolition, electronics and other (residuals off table/floor); and detrimental contaminant categories of bagged recycling, plastic film, wrapables (hoses, cords), textiles, sharps and hazardous waste. All materials were sorted into a large Rubbermaid can or a small Rubbermaid tote. Samples were

weighed and recorded into the proper category on the spreadsheet. The tare weights for each sorting container were subtracted during the calculation process.

ANALYSIS

The total sample size was 1,763.60 pounds, of which recycling amounted to 1,274.50 pounds, non-detrimental contaminants weighed 289.40 pounds and detrimental contaminants weighed 199.70 pounds. This amounts to a MRF contamination rate of 27.73%. The contaminants were categorized as detrimental and non-detrimental based on their impact on the safety and efficiency of MRF operations. Plastic film and wrapables don't weigh as much as glass but can cause hours per day of downtime while equipment is being cleaned.

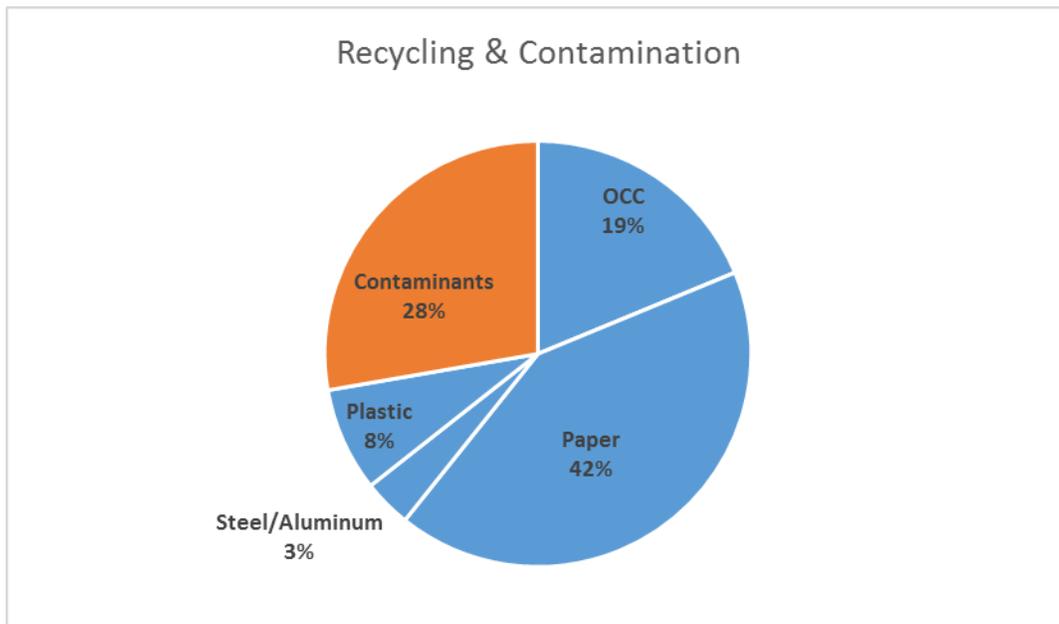


FIGURE 1 - CHART SHOWING PERCENTAGE OF RECYCLABLES AND CONTAMINATION

A total of 489.10 pounds of contaminants were found within the recycling sample sorted, of which 269.70 pounds could have been recycled if they had not been bagged or if they had been taken to the proper location (i.e. glass drop off, textiles to thrift store, etc.) instead of being included into the co-mingled curbside stream (represented in blue on the graph below). If those materials had been unbagged and or recycled correctly through drop off locations, the curbside contamination rate would have been 12.44%.

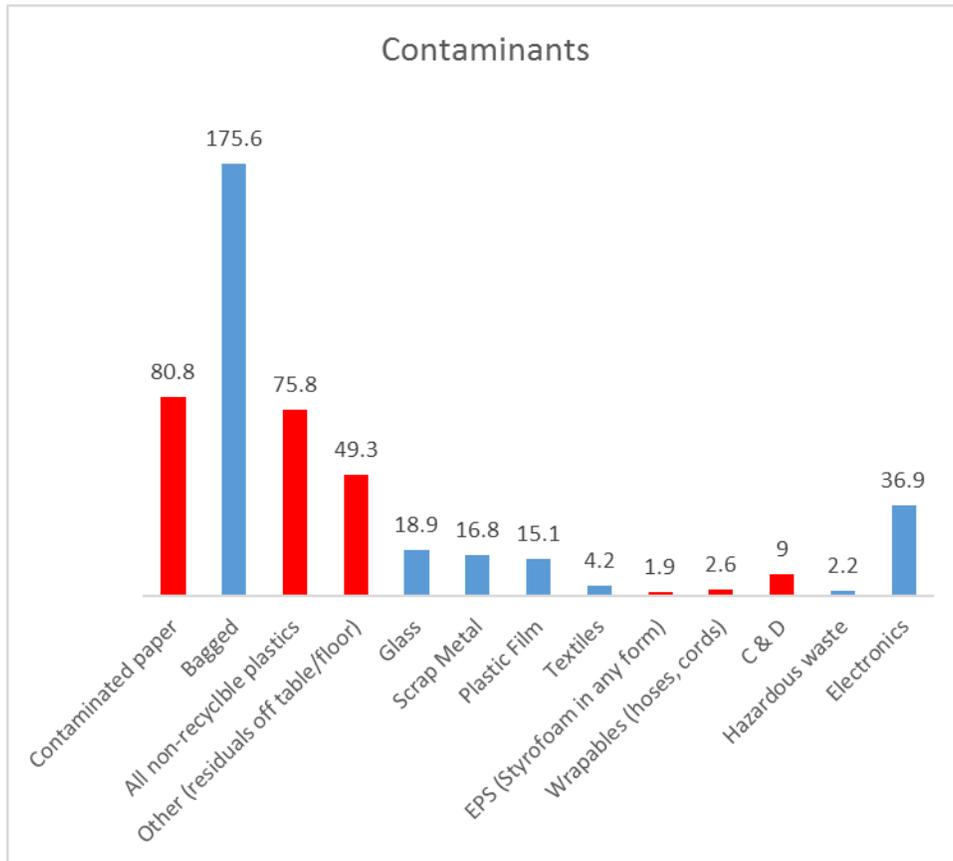


FIGURE 2 - CHART SHOWING TYPES OF CONTAMINANTS BY WEIGHT



FIGURE 3 PLASTIC FILM



FIGURE 4 PLASTIC FENCING

STATISTICAL ANALYSIS/ RECOMMENDATIONS

The BTG/Overland Park/WM MRF audit revealed contamination types consistent with national recycling markets in the US, as you can see from the lists below.

Overland Park audit results

(in order based on % found in recycling audit)

- Bagged recycling (9.96%)
- Contaminated paper (4.58%)
- All non-recyclable plastics (4.30%)
- Other (residuals off table/floor) (2.80%)
- Electronics (2.09%)
- Glass (1.07%)
- Scrap metal
- Plastic film
- Construction & demolition
- Textiles
- Wrapables (hoses, cords)
- Hazardous waste
- EPS (Styrofoam in any form)
- Organics (food, yard waste, liquids)

National common contaminant list

(in no particular order)

- Bagged recycling
- Contaminated paper
- All non-recyclable plastics
- Electronics
- Scrap metal
- Plastic film
- Construction & demolition
- Textiles
- Organics (food, yard waste, liquids)
- EPS (Styrofoam in any form)
- Wrapables (hoses, cords)

The two largest contaminants in the Overland Park audit by weight were bagged recycling and contaminated paper. Johnson County, which includes Overland Park, has already been working on an education campaign to reduce the prevalence of bagged recycling and bags/plastic film in the recycling stream. This messaging needs to be increased to make residents aware of the damaging impacts and frequency of occurrence. The second largest contaminant, contaminated paper, should be addressed next, but will be difficult to educate on due to its subjectivity. Residents need to know that food-contact



FIGURE 5 CONTAMINANTS (BAGGED MATERIALS) REMOVED DURING AUDIT

paper (frozen food packaging, napkins, paper plates/cups, and tissues) and all paper pieces smaller than a playing card are not recyclable.

Also, general recycling education should be increased to help eliminate the “contaminants” in the curbside bins that can be recycled elsewhere, including glass, plastic film, textiles, electronics, hazardous waste and yard waste. As mentioned previously, this would help eliminate approximately half of the current contamination. And if the residents can eliminate half before it gets to the MRF, this would allow the MRF to focus their labor efforts on the remaining 12%. The

general recycling education would also help increase the recycling of acceptable materials. As seen in the graph below, Johnson County falls below the national average in recycling cardboard and paper and aluminum and steel. These are highly recyclable commodities and should be captured in the recycling stream.

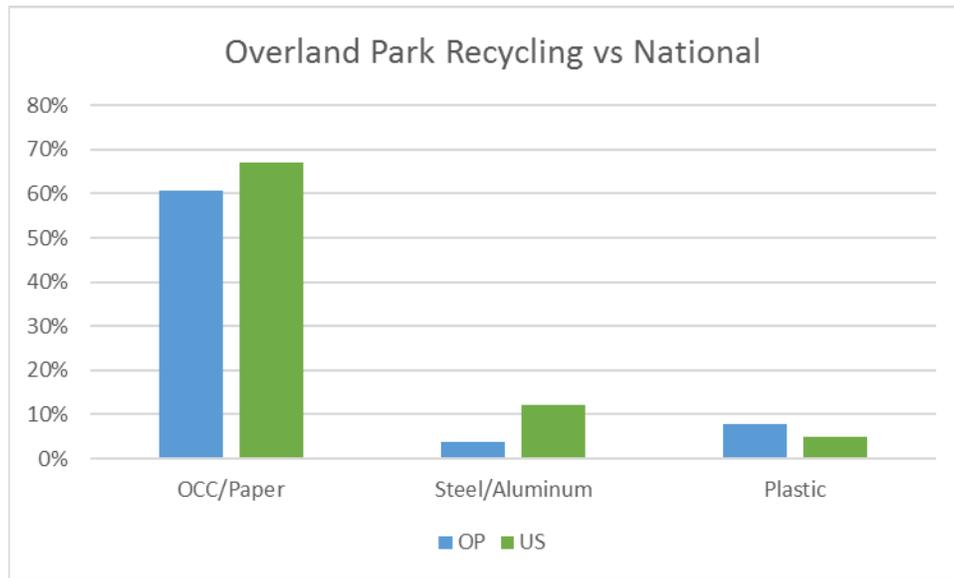


FIGURE 6 - CHART SHOWING PERCENTAGE OF RECYCLING IN OVERLAND PARK AND US, BY PERCENTAGE AND COMMODITY TYPE

CONCLUSION

Overland Park residents are doing a respectable job of putting what they believe to be acceptable materials into the curbside recycling stream, but more education is needed regarding what is acceptable within the plastics and paper streams. A contamination rate of 28% is not conducive for the long-term viability of the recycling program. Also, education should focus on increasing recycling of cardboard and aluminum/steel to maximize those commodity streams.