

How did a recycling
composition study
help Miami-Dade
County?

SCS ENGINEERS

Miami-Dade County Department of Solid Waste Management - Overview

- One of the largest publicly operated solid waste collection and disposal system in the southeastern United States
- An integrated waste management system that provides collection, transfer and disposal services to include landfills
- Provides waste collection services to more than 340,000 households in a 320-square-mile waste collection service area
- Disposal system processes more than 1 million tons of waste annually

Curbside Recycling Program

- Provide curbside, single-stream recycling collection in wheeled carts
- More than 350,000 households
 - More than 340,000 waste service households
 - 9 interlocal municipalities (recycling service only)
- Service provided every-other-week
 - Two municipalities receive weekly service per agreements
- Collection provided by two contractors
 - Coastal Waste and Recycling
 - Waste Connections
- Recyclables processed by Waste Management, Inc.



Curbside Recycling Program

- Accepted contract materials
 - Cardboard
 - Including lightly-greased pizza boxes
 - Cans
 - Aluminum and steel
 - Paper
 - Cartons
 - Bottles
 - Plastic and glass
 - Plastic tubs and jugs



Why was a recycling composition study needed?

- DSWM conducts composition studies every several years
- Determine an updated recycling contamination
 - 2020 = 49%
 - During the height of the COVID-19 pandemic
- Recycling contracts were expiring
- Wanted an up-to-date understanding of the items placed in recycling carts
- Identify problem contaminants to better educate customers

Key Aspects

- Focused on residential materials
- Designed to be comparative
- 29 Distinct material categories
- Measured contract vs. contaminated contract materials
- Supported by material quality expert
- Followed ASTM Standard (to extent possible)
- Targeted all collection zones

Sampling Plan

Zone	Annual Tonnage Collected	Percent of Tonnage	Targeted Number of Samples	Actual Number of Samples
1	19,060	33%	33	34
2	16,948	29%	29	31
3	21,962	38%	38	39
TOTAL	57,971	100%	100	104

Contract Materials

CONTRACT MATERIALS	
Paper	Corrugated Cardboard OCC Pizza Boxes SRPN Paperboard Poly-Coated Containers
Plastics	# 1 PET (narrow-neck bottles only) # 2 HDPE Natural (narrow-neck bottles # 2 HDPE Colored (narrow-neck bottles Other #3 - #7 Bottles (narrow-neck
Metal	Tin/Steel Cans Aluminum Cans
Glass	Food/Beverage Containers

Contaminated Contract Materials

CONTAMINATED CONTRACT MATERIALS	
Paper	Corrugated Cardboard OCC Pizza Boxes SRPN Paperboard Poly-Coated Containers
Plastics	# 1 - # 7 Bottles (narrow-neck bottles only)
Metal	Tin/Steel/Aluminum Containers
Glass	Glass Food/Beverage Containers

Non-Contract Materials

NON-CONTRACTED MATERIALS	
Plastics	Bulky Rigid, Film #5 Plastic Containers #1 - #7 Non-Bottle Containers
Bagged Materials	Bagged materials and their contents;
Textiles	Fabric, Cotton, Polyester, etc.
Hazardous Materials	Medical, Chemical, and Other Electronics
Various	Non-Contract Materials that do not fit into another category
Fines	Fine material too small to sort

Health and Safety

- Site specific health and safety plan
- Daily “tailgate” meetings
- PPE
- Nitrile and Hexarmor Needlestick Gloves
- Safety Vests
- Safety Glasses
- Tyvek Suit – depending on temperature
- Hard Hats Steel-toed boots
- Hand Sanitizer, Eyewash station
- SSHSP

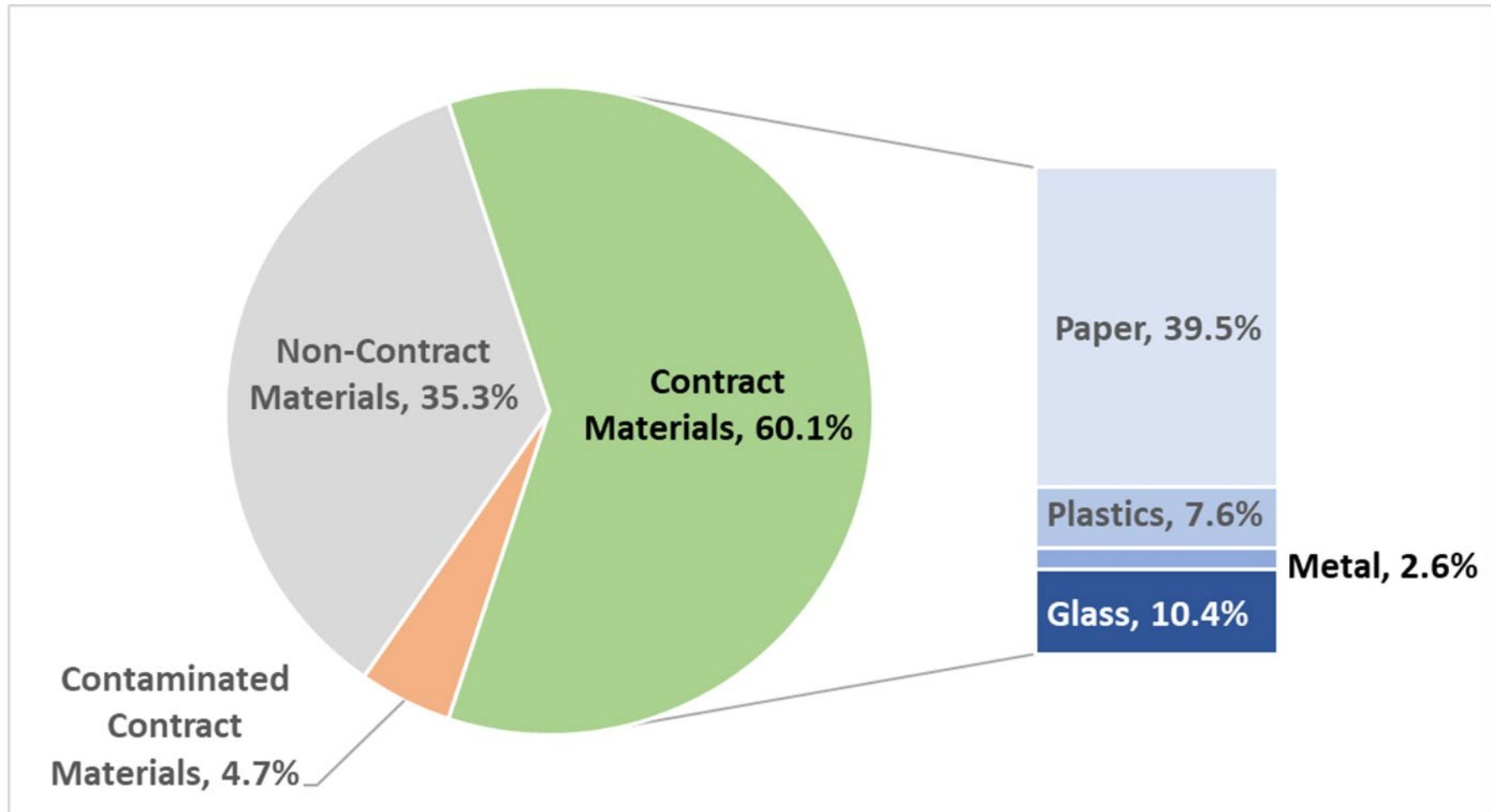
Sample Gathering



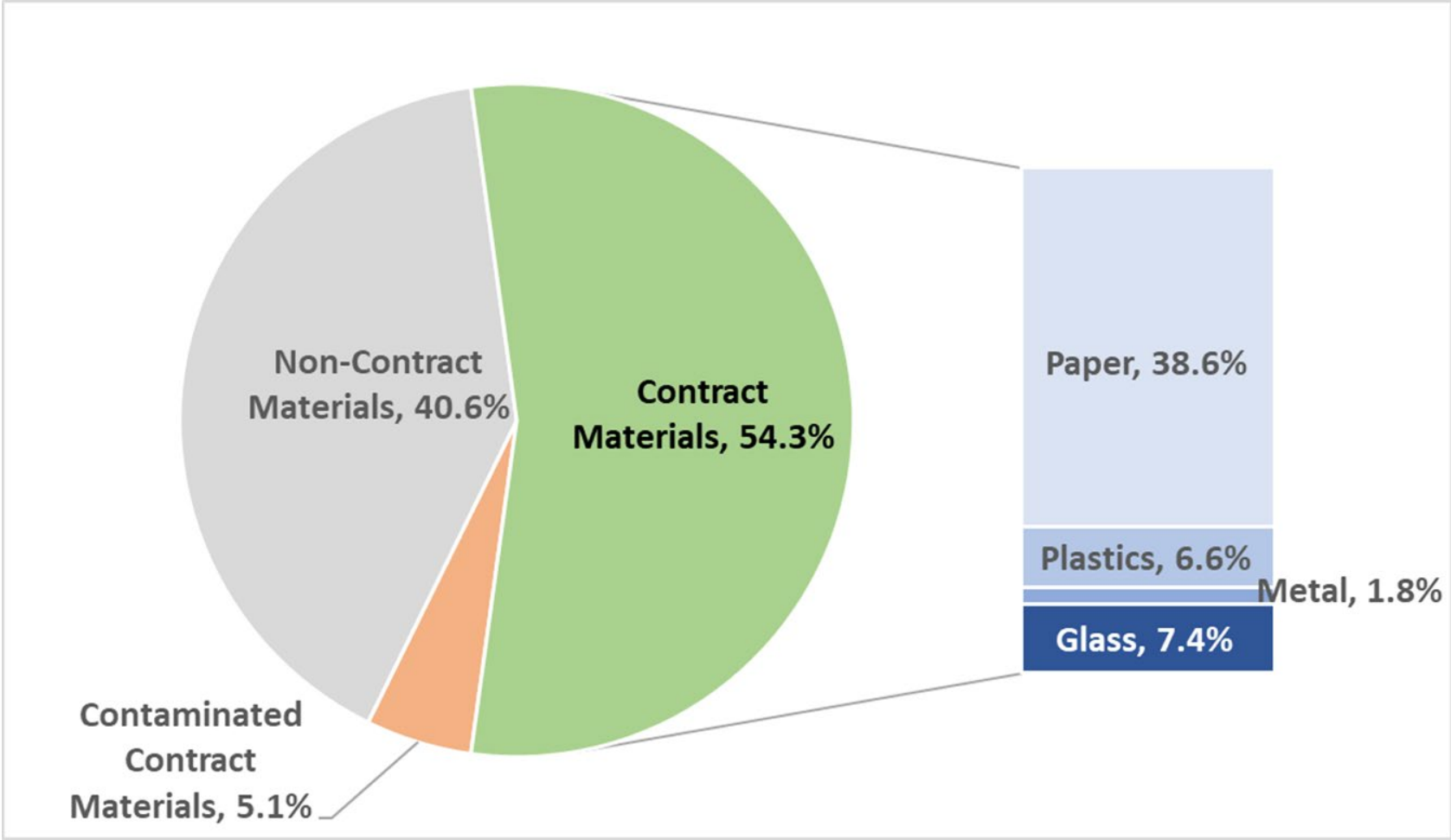
Sample Sorting and Weighing



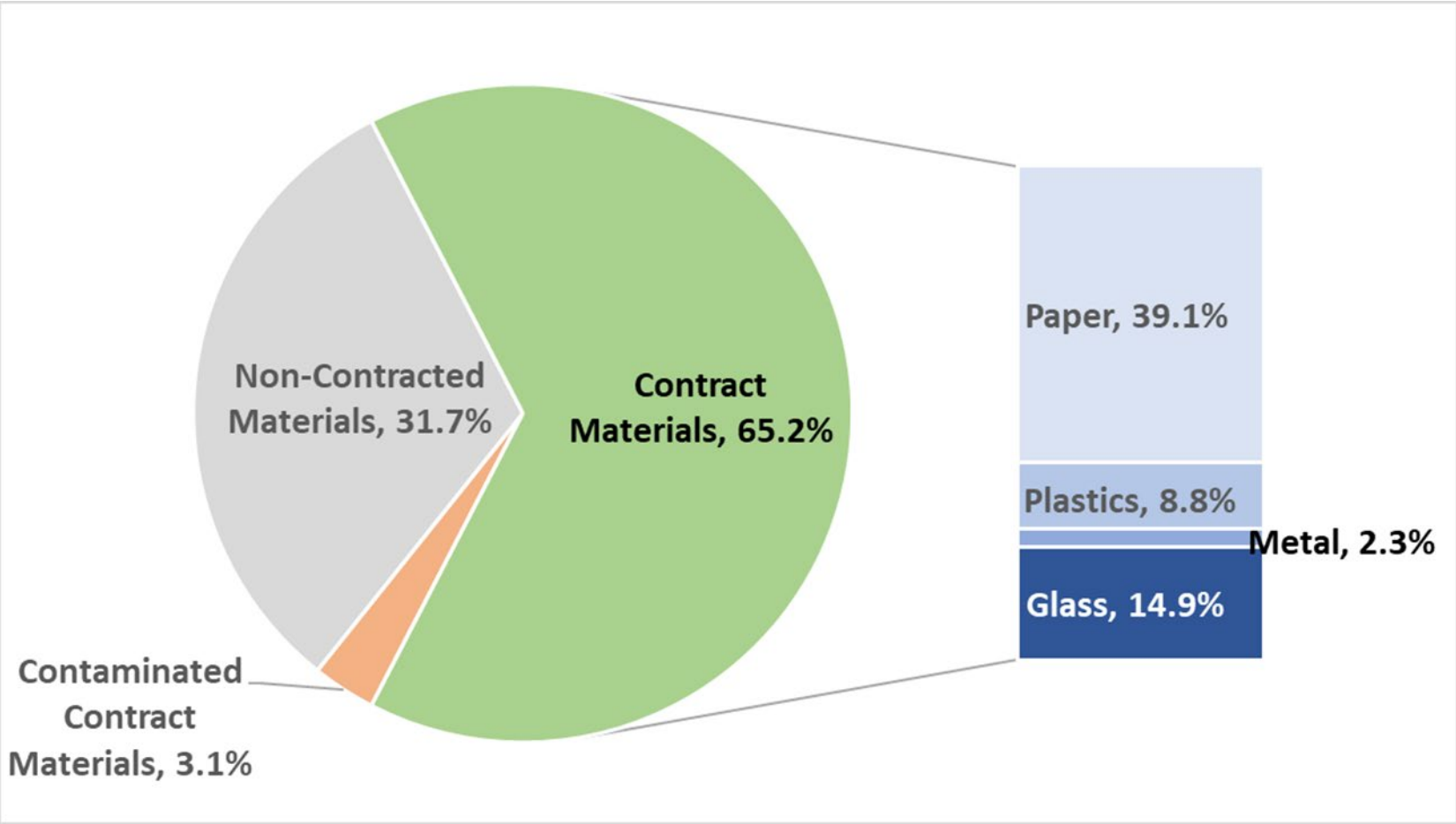
Overall Composition



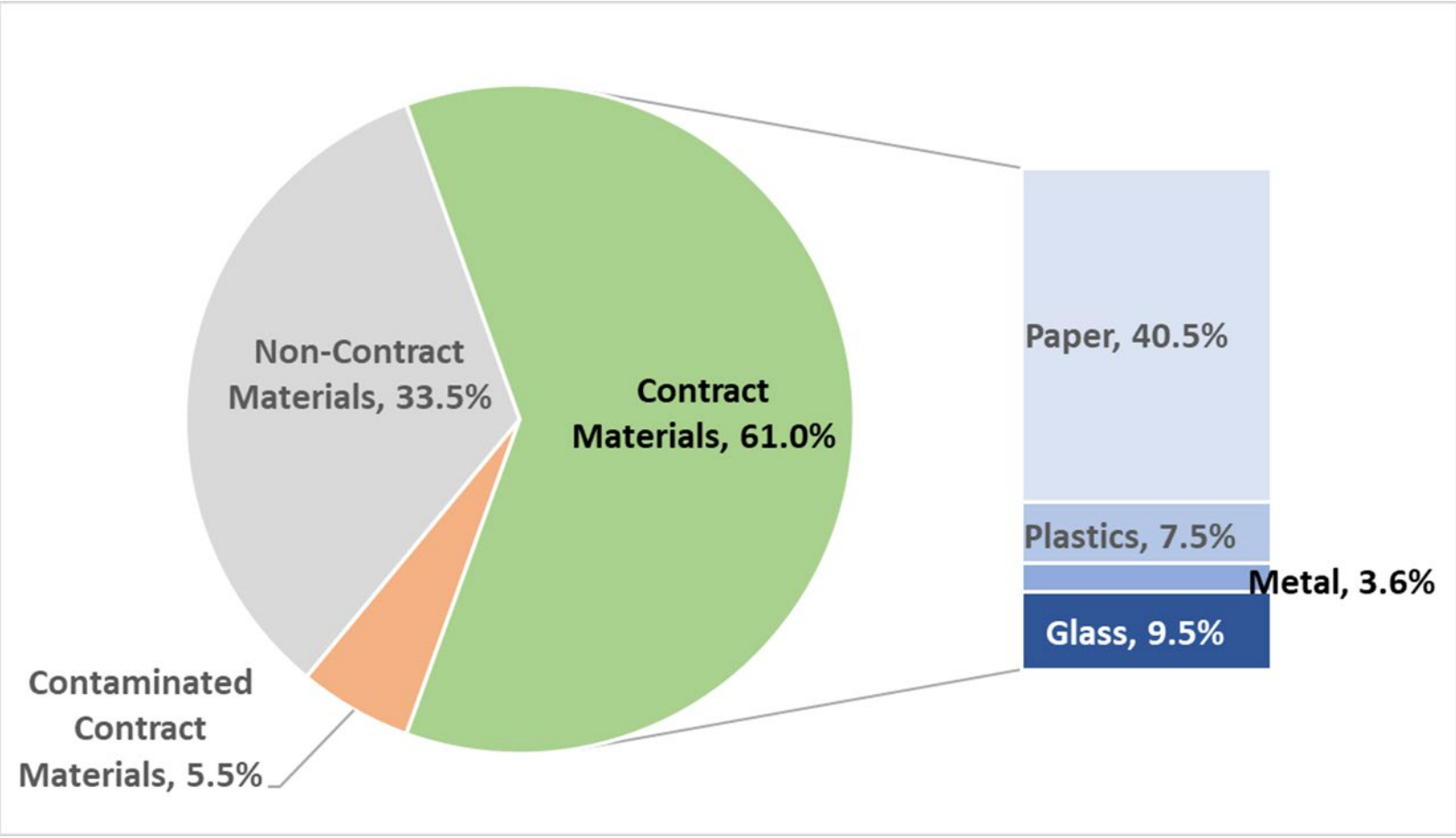
Zone 1 Composition



Zone 2 Composition



Zone 3 Composition



Data Comparison

MATERIAL	2015 Composition ¹	2018 Composition ¹	2020 Composition ¹	2023 Composition
CONTRACT MATERIALS				
Total Contract Materials	72%	61%	51%	60%
NON-CONTRACT MATERIALS				
Total Non-Contracted Materials	28%	40%	49%	40%
TOTAL	100%	100%	100%	100%

Recycling Processing Contract

- Negotiated a contract (bridge agreement) with Waste Management, Inc., to process recyclables
 - Separate from contracts with collection contractors
 - Went into effect Apr. 1, 2023
- Prior to bridge agreement DSWM did not pay for processing of recyclables
- Recyclables processing includes sorting and baling of recyclables
 - Waste Management, Inc., markets baled material to manufacturers
- New recycling contract is pending



How composition study results were used



- Reduction of recycling contamination rate
 - 2020 = 49%
 - 2023 = 40%
- Reduced contamination rate data was used to negotiate a lower recycling processing cost in contract negotiations

Recycling Processing Cost Comparison (Approx.)

Negotiated Processing Cost (Apr. 2023)

- Average processed tons
 - 60,000 tons annually
- Negotiated rate
 - \$143.99 per ton
- Approx. processing cost
 - \$8,639,400 annually
- Approx. processing cost over 5 years
 - \$43,197,000

Renegotiated Processing Cost (Oct. 2023)

- Average processed tons
 - 60,000 tons annually
- Renegotiated rate
 - \$132.49 per ton
- Approx. processing cost
 - \$7,949,400 annually
- Approx. processing cost over 5 years
 - \$39,747,000

Approximate processing cost savings over 5 years (assuming rates stay the same in the new contract):

\$3,450,000

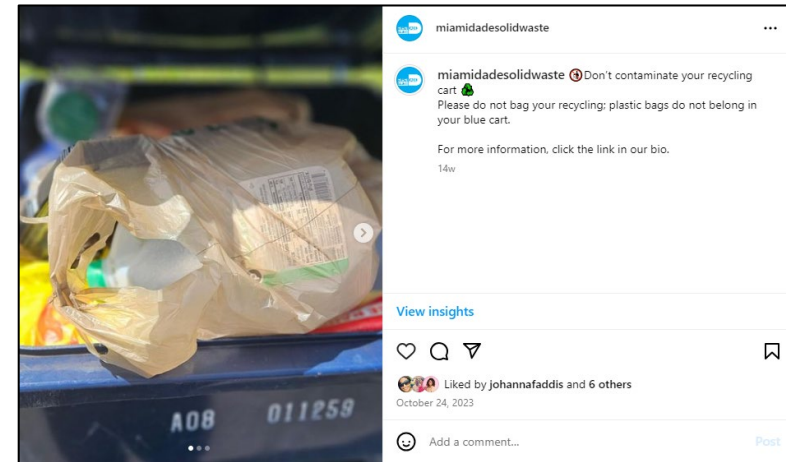
Other ways composition study results were used



- Identified problem contaminants
 - Bagged materials and their contents
 - Non-contract materials
 - Plastics
 - Plastic bags and film
 - Textiles

Other ways composition study results were used

- Focused recycling messaging to highlight problem contaminants
- Incorporated messaging on social media and advertising
- Adding hot stamp messaging to recycling cart lids
- Promoting the success of reducing the contamination rate, while also emphasizing that there is more work to be done



Opportunities to increase recycling

- Possible debugging equipment at processing facilities
- Expanding accepted contract materials
- Recycling contamination abatement program to identify contaminated carts at the curb
- Targeted messaging in areas with high recycling contamination
- Increase public education