Plastic Recycling Corp. of California

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CALIFORNIA PET BALE COMPOSITION ANALYSIS: 2022 UPDATE

INTRODUCTION

The Plastic Recycling Corp. of California (PRCC)—the oldest and most successful producer responsibility organization in California—is committed to ensuring California PET bales meet or exceed statewide bale quality standards. Our goals include adding value to quality loads, increasing yield[1], increasing the PET recycling rate, and improving the efficiency of the California Redemption CRV program.

This study was undertaken as a continuation to the 2020 and 2021 Bale Composition Analyses: the results confirm there are two types of curbside bales in California, those that include PET thermoforms along with PET bottles, and those which do not. In 2021, PRCC added a bale specification: Grade B with Thermoforms (BwTF) to more accurately reflect the value of recycled PET bales.

Grade BwTF bales have a significantly lower percentage of clear/light-blue PET bottles, which are needed to make new PET bottles. Even more importantly, PET CRV comprised only 47% of the bale in BwTF bales, compared to 66% PET CRV in curbside bales without thermoforms. Curbside programs get paid a commingled rate of 61% CRV PET, thus curbside programs that include thermoforms in their bales are overpaid for CRV, while those that do not are being underpaid. ***This clearly indicates that the commingled rate is inaccurate and needs updating***.

In addition, all the curbside bales had more contamination (e.g., trash & non-PET) than the Certified Recycling Center redemption bales. PRCC strongly supports California's deposit program and recommends the program be modernized and expanded with more redemption sites. ***This bale sort study, reinforces the need to strengthen the CRV redemption system*** as these bales are the highest quality, from a proven system that is highly effective.

Compared to redemption material, curbside bales have a lower percentage of caps and labels attached to PET bottles. PRCC and CalRecycle have a goal of getting more caps and labels recycled which cannot happen if they are not attached to the bottle. ***This points to the need for a public outreach campaign that encourages consumers to: Empty—Squeeze—Replace Cap and return for deposit***.

[1] Yield = the percentage of PET bales that are made into new PET bottles, packaging or fiber

METHODOLOGY

PRCC staff sorted 3,097 pounds of PET from bales taken from 15 facilities throughout California. Each bale was from one of 5 Categories, shown below in descending order of quality.

Category	Description
A	Redemption centers
B+	Curbside with enhanced sorting
B	Curbside with manual positive sort[2] of bottles only Curbside with auto-sort technology, then remove TF manually
BwTF+	Curbside with auto-sort technology, then partially remove TF manually or robotically
BwTF	Curbside with manual positive sort of bottles and TF Curbside with auto-sort technology[3]

PRCC used the Association of Plastic Recyclers' Protocol for Assessing PET Truckload Bale Grade that staff previously tested successfully to ensure that it accurately reflects the composition of bales.

For each bale, PRCC staff noted the Category, then pulled and weighed at least 200 pounds from random locations within the bale to get a representative sample. Staff then sorted the sample material into 18 different groups according to the table below.

First Sort	Second Sort
PET CRV Bottles PET Non CRV Bottles	Clear or Light Blue Green Other Colors Full Wrap Barrier Bottles with Metal
Thermoforms	Clear PET Colored PET Non-PET
Non-PET Other Plastic Metal/Aluminum Waste/Other Contaminants	No Second Sort

This year, staff from Niagara Waters assisted PRCC staff with an additional sort to determine the percent of CRV bottles that with caps and labels still attached.

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[2] Positive sort = removing the targeted material from the sort line, as opposed to removing contamination and leaving the targeted material

[3] Curbside with auto-sort technology is the most common curbside practice in California

FINDINGS

In 2022, Grade B with Thermoforms (BwTF) bales had 47% CRV, compared to 66% CRV in Grade B bales and 94% CRV in Grade A bales.

CalRecycle determines the commingled rate (mix of CRV and none-CRV PET) that curbside programs receive for their PET bales. The rate was set at 61% CRV PET in 2022. This is a CRV ***overpayment*** of millions of dollars annually to MRFs that include thermoforms with their PET bottles.

2022 Bale Sort	Grade A	Grade B	Grade BwTF
PET CRV	94%	66%	47%
PET Non CRV	4%	30%	23%
PET Thermoform	0%	1%	18%
Non PET Other Plastic	1%	1%	6%
Metal/Aluminum	0%	0%	1%
Waste/Other Contaminants	1%	2%	6%
PET Bottles (CRV and Non CRV)			
Clear or Light Blue Bottles	89%	82%	58%
Green Bottles	5%	5%	3%
Other Color Bottles	0%	1%	1%
Bottles with Full Wrap Labels	4%	8%	5%
Caps Attached	75%	56%	
Labels Attached	98%	85%	

In 2022, Grade BwTF averaged only 58% clear/light blue bottles versus 82% clear/light blue bottles in Grade B bales, and 89% clear/light blue bottles in Grade A bales. This is an important metric because clear/light blue bottles are the only colors used to manufacture new bottles.

Niagara Waters staff found that CRV bottles in Grade A bales have a higher percentage of caps and labels still attached: roughly 75% of caps and 98% of labels were attached to redeemed bottles, versus 56% of caps and 85% of labels attached to curbside bottles.

California's PET reclaimers separate caps & labels for recycling, but this cannot happen if they are not attached to the bottle. ***This points to the need for consumer education, encouraging the public to Empty - Squeeze - Replace Cap and return for deposit***.

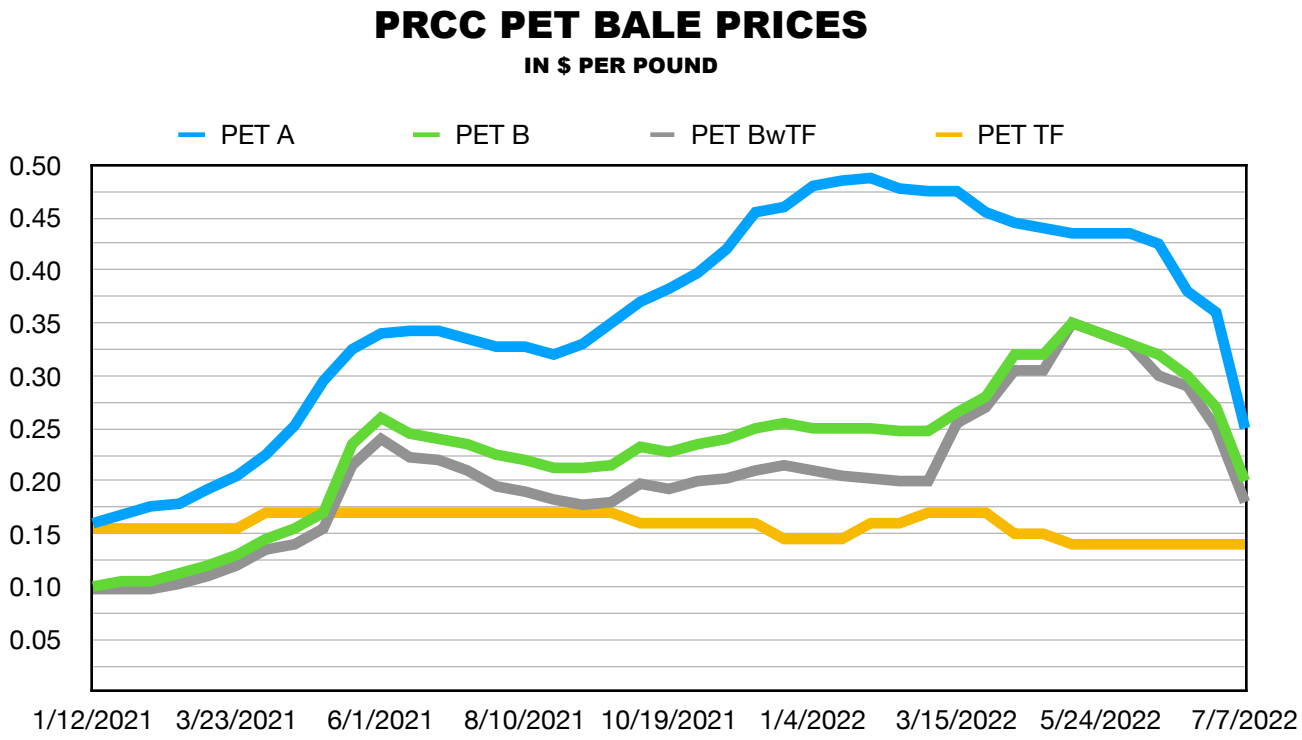
The 2022 findings are consistent from previous year's sorts. The amount of non-CRV continues to rise in Grade B curbside bales. Grade BwTF bales have higher amounts of other plastic and contaminants that reduce the overall quality.

Grade B	**2022**	**2021**	**2020**
PET CRV	66%	69%	74%
PET Non CRV	30%	26%	22%
PET Thermoform	1%	1%	1%
Non PET Other Plastic	1%	1%	1%
Metal/Aluminum	0%	0%	0%
Waste/Other Contaminants	2%	2%	3%
PET Bottles (CRV and Non CRV)			
Clear or Light Blue Bottles	82%	85%	83%
Green Bottles	5%	4%	6%
Other Color Bottles	1%	1%	1%
Bottles with Full Wrap Labels	8%	5%	6%

Grade BwTF	**2022**	**2021**	**2020**
PET CRV	47%	46%	43%
PET Non CRV	23%	28%	29%
PET Thermoform	18%	15%	21%
Non PET Other Plastic	6%	3%	1%
Metal/Aluminum	1%	1%	1%
Waste/Other Contaminants	6%	6%	5%
PET Bottles (CRV and Non CRV)			
Clear or Light Blue Bottles	58%	61%	61%
Green Bottles	3%	3%	3%
Other Color Bottles	1%	1%	1%
Bottles with Full Wrap Labels	5%	6%	4%

The results of this bale sort support the findings from the 2020 & 2021 sorts: CA MRFs with auto-sort technology have a significant amount of PET thermoforms in the bales—unless they successfully **hand-pull** thermoforms after the initial PET sort to create a separate thermoform bale. MRFs that positive-sort only PET bottles, have very few PET thermoforms and less overall contamination.

PRCC has four PET bale specifications, all of which can be found on the website www.PRCC.biz. PET buyers value Grade B over Grade B with Thermoforms (BwTF) and continue to value Grade A bales over Grade B bales. Grade A bales are the cleanest. Grade A has the highest yield, the highest percentage of clear bottles, and requires less processing; thus it is lower in cost and energy to convert bottle-to-bottle.



The following are details on how the different methods of sorting curbside material into Grade B and Grade BwTF compare to each other. It appears efforts to do a secondary sort to remove thermoforms are making a significant difference.

2022 Bale Sort	B+	B
PET CRV	66%	66%
PET Non CRV	32%	24%
PET Thermoform	0%	2%
Non PET Other Plastic	1%	4%
Metal/Aluminum	0%	0%
Waste	1%	5%
PET Bottles		
Clear or Light Blue	83%	79%
Green	5%	4%
Other Color	1%	0%
Full Wrap	8%	6%
Commingled Payment $0.61/lb. ($1,220/ton)		
Under 61%	-5%	-5%
Underpaid $/ton	**-$61.00**	**-$61.00**

All BwTF Grades—whether hand-sorted or auto-sorted—are still well below the 61% PET CRV commingled rate, which means ***all four BwTF Grades are being overpaid for CRV by as much as $268 per ton***.

2022 Bale Sort	BwTF Manual Positive Sort	BwTF Auto Sort[3]	BwTF Auto Sort Partial Manual Removal of TF	BwTF Auto Sort Robotic Removal of TF
PET CRV	39%	43%	53%	58%
PET Non CRV	12%	23%	27%	20%
PET Thermoform	23%	21%	13%	10%
Non PET Other Plastic	22%	2%	2%	3%
Metal/Aluminum	0%	2%	1%	1%
Waste	3%	8%	5%	8%
PET Bottles				
Clear or Light Blue	42%	57%	66%	67%
Green	2%	3%	3%	3%
Other Color	1%	1%	2%	1%
Full Wrap	6%	5%	7%	6%
Commingled Payment $0.61/lb. ($1,220/ton)				
Over 61%	22%	18%	8%	3%
Overpaid per $/ton	**$268.40**	**$219.60**	**$97.60**	**$36.60**

CONCLUSION

As noted in last year's report, the Commingled Rate is inaccurate and needs updating to reduce contamination, protect the integrity of the CRV system, and improve the quality of bales.

FACT

Commingled Rate is inaccurate and needs updating

***All curbside operators making Grade BwTF bales are being overpaid for CRV, and all curbside operators that are generating clean Grade B bales though hand-sorting are being underpaid*.**

PRCC strongly supports PET thermoform recycling. Staff is working with MRFs to separate PET thermoforms from the PET bottles. There are several buyers consistently taking PET thermoform loads. Keeping thermoforms separate from PET bottles improves the economics of PET bottle reclamation through improved yields and results in better quality recycled PET that will be converted into new PET bottles.

Unfortunately, the current Beverage Container Recycling law is inhibiting the production of clean curbside PET bales. As written, the commingled rate allows PET thermoforms to be counted as non-CRV PET. This unfairly enriches programs that combine PET bottles with thermoforms, and creates a disadvantage to programs that separate them.

FACT

CA Needs Healthy CRV Redemption Centers

to increase

Bottle-to-Bottle Recycling and
Cap & Label Recycling

While PET recycling rates in California have stayed relatively high, there has been a shift in collection from Certified Recycling Centers to curbside programs. All the Grade A bales from Certified Recycling Centers (redemption centers) had less contamination, more caps & labels, and more clear bottles than the Grade B bales (from curbside). ***Clear, clean PET is needed to manufacture new PET bottles with recycled content.*** California must have a healthy CRV redemption system with higher recycling rates in order to satisfy bottle-to-bottle content mandates and to capture caps and labels for recycling.

PRCC strongly supports California's deposit program. This—and previous sorts—clearly show the need to modernize the CRV redemption system as these bales are the highest quality and most likely to be converted back into new PET bottles. ***The CRV redemption system is a highly effective collection mechanism with a high recycling rate of valuable PET bottles, and it can be better.***

PRCC believes in modernizing the CA Beverage Deposit program. Allowing more programmatic flexibility in how deposits are returned to consumers, using accurate accounting, and focusing on underserved areas, the CRV program will successfully serve all California residents, create jobs, reduce greenhouse gases, and provide quality feedstock to California's businesses.

ACKNOWLEDGEMENTS

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Thank you also to staff from Niagara Waters. We truly appreciate your hands-on assistance, the additional valuable data on Caps and Labels, and the nice lunches!