Plastic Pollution Prevention and Packaging Producer Responsibility Act

Public Meeting: Material Characterization Study Preliminary Findings

SB 54 (Allen, Chapter 75, Statutes of 2022)

Department of Resources Recycling and Recovery (CalRecycle)

October, 28, 2025

Safety Announcement

In the event of a fire alarm, we are required to evacuate.

1. Take your valuables and use exit signs.
2. Do not use elevators.
3. If you cannot use stairs, you will be directed to a protective vestibule inside a stairwell.
4. If relocated, exercise caution crossing the street.

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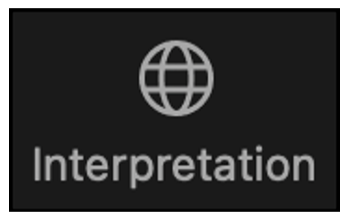

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Today's Public Meeting

- Present on CalRecycle's recent SB 54 publications:
  - What's in California Landfills: Measuring Single-Use Packaging and Plastic Food Service Ware Disposed Of 2025 – SB 54 Material Characterization Study Revised Preliminary Findings
- All previous public workshop materials are available on CalRecycle's SB 54 webpage under "Past Events."
- Not addressing today:
  - Rulemaking or draft regulatory text. Please refer to CalRecycle's SB 54 regulations webpage for regulatory updates.
  - Needs Assessment or the Covered Material Categories (CMC) list update. Please refer to the SB 54 CMC webpage for CMC list updates.

Agenda

Opening Remarks

Dan Brown, Acting Policy Director, Policy Development and Analysis Office

Part 1: SB 54 Material Characterization Study Overview

Jennifer Haynes White, Senior Environmental Scientist Supervisor, Knowledge Integration Section

Part 2: General Material Characterization Study

Travis Dennis, Environmental Scientist, Knowledge Integration Section

Part 3: Study Methodology and Report Overview

Monica Oropeza, Environmental Scientist, Knowledge Integration Section

Part 4: Preliminary Findings

Travis Dennis, Environmental Scientist, Knowledge Integration Section

Part 5: Next Steps

Dan Brown, Acting Policy Director, Policy Development and Analysis Office

Part 6: Questions and Public Comments

Marcus Santillano, Environmental Program Manager, Packaging EPR Section

Public Comments (1 of 2)

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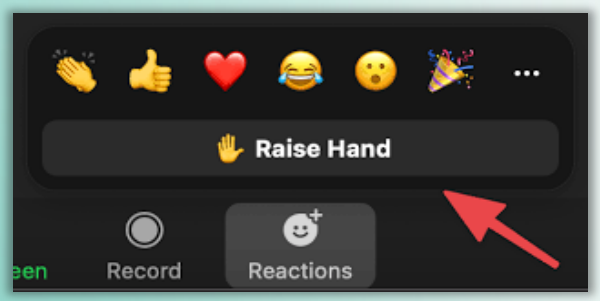
- **Participating on Zoom** – please raise your hand when the chair opens public comments; the host will unmute you.



- **Written comment via Zoom** – please use the chat box and message the entity named "Public Comments"
- Email wastechar@calrecycle.ca.gov Subject: SB 54 MCS Public Meeting

Opening Remarks

Dan Brown
Acting Policy Director, Policy Development and Analysis Office

Part 1. SB 54 Material Characterization Study Overview

Department of Resources Recycling and Recovery
Knowledge Integration Section

Jennifer Haynes White
Senior Environmental Scientist Supervisor, Knowledge Integration Section

SB 54 Material Characterization Study (MCS)

- Senate Bill (SB) 54 requires CalRecycle to conduct and publish a characterization study to determine the approximate amount of covered material disposed of in California landfills – Public Resources Code (PRC) 42061(a)(2)-(3).
- CalRecycle must update the study in 2028, 2030, 2032, and every four years thereafter. – PRC 42061(a)(4)
- CalRecycle may publish additional information that was not available at the time of the most recent MCS. – PRC 42061(a)(5)

Report Publication and Public Engagement Timeline

- June 30, 2025 - Preliminary Report (DRRR-2025-1755) published
- September 30, 2025 – Revised Preliminary Report (DRRR-2025-1757) published
- October 28, 2025 – Public Meeting
- November 12, 2025 – Submission date for public comments to inform final findings (wastechar@calrecycle.ca.gov)
- By December 27, 2025 – Final Findings Report published

Part 2. General Material Characterization Study Overview

Department of Resources Recycling and Recovery
Knowledge Integration Section

Travis Dennis

Environmental Scientist, Knowledge Integration Section

What is a Material Characterization Study (MCS)?

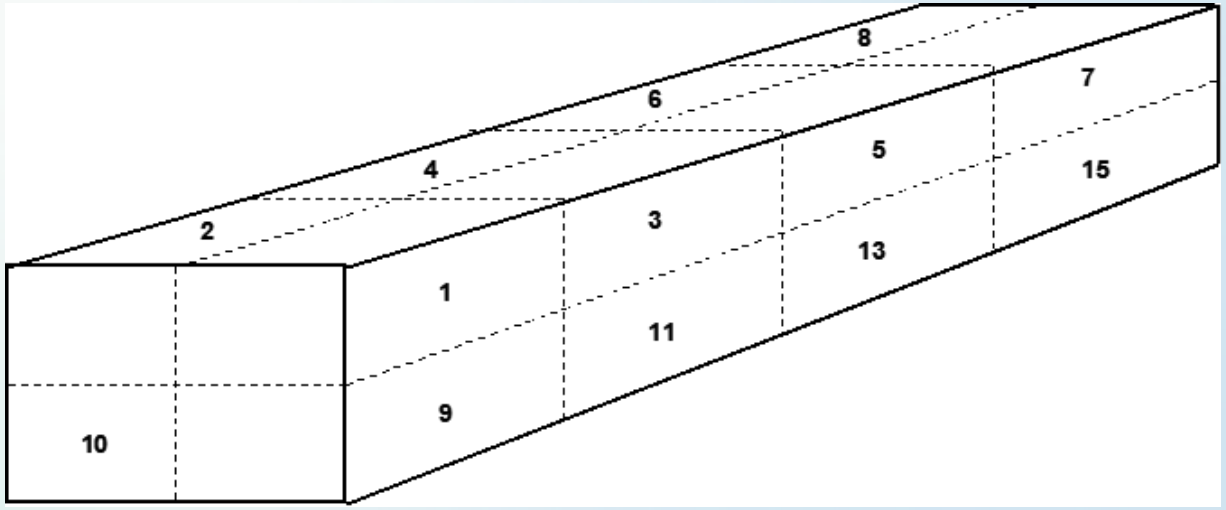
- Study to estimate the composition of material in a specific material stream, such as landfill disposal Video Link

Fieldwork Preparation

1. Study design
   - Development of sorting categories and related training materials
   - Review and approve contractor study design
2. Site determination
   - Information gathering for each selected site
     - Estimates of the minimum number of vehicles by sector per day
     - Estimates for tonnage inflows by sector
3. Site selection
   - Scheduling logistics
   - Sorting crew needs and requirements

Fieldwork Activities

1. Gate surveys and vehicle selection
   - Gathered information on incoming vehicles
   - Selected vehicles for sampling
   - Collected additional data on the selected vehicles
2. Sample selection
   - Imaginary 16 cell block grid imposed over truck load
   - At random, selected 1 of the cell block
   - Extracted a 200-pound sample from selected cell
3. Sample screening and sorting
4. Weighing of sorted materials



Post-Fieldwork Activities

- Data Preparation
  - Align samples and materials between datasets
- Data Analysis
  - Compositional estimates (using sort data)
  - Relative disposal tonnage estimates by sector (using gate survey data)
  - Statewide disposal tonnage estimates (using RDRS data)
- Report Writing

Part 3. SB 54 MCS Methodology and Report Organization

Department of Resources Recycling and Recovery
Knowledge Integration Section

Monica Oropeza
Environmental Scientist, Knowledge Integration Section

Scope of Preliminary Findings

- This report presents the findings of the material characterization study conducted to determine the approximate amount of covered materials (i.e. single-use packaging and single-use plastic food service ware) disposed of in California landfills.
- The findings do not address material sent for recovery or ultimate disposition of materials transferred out of state.

CalRecycle's Role

- Project oversight
- Quality control sort on all Remainder/Composite categories
  - For subset of samples, conducted additional sort to identify additional covered materials
- Data analysis
- Report writing

Contractor's Role

- Conducted vehicle surveys
  - Gathered information on incoming vehicles
  - Selected vehicles for sampling, and
  - Collected additional data on the selected vehicles
- Collected samples from selected vehicles
- Sorted and weighed samples into 83 categories
- CMC categories: Class → Type → Form
  - Remainder class categories: Ceramics, Glass, Metal, Paper/Fiber, Plastic, and Wood and Other Organic Materials.
  - Conducted de-packaging analysis, volume-to-weight determination, and unknown plastic analysis on a subset of sampled material
- Provided QA/QC'd sorting data to CalRecycle

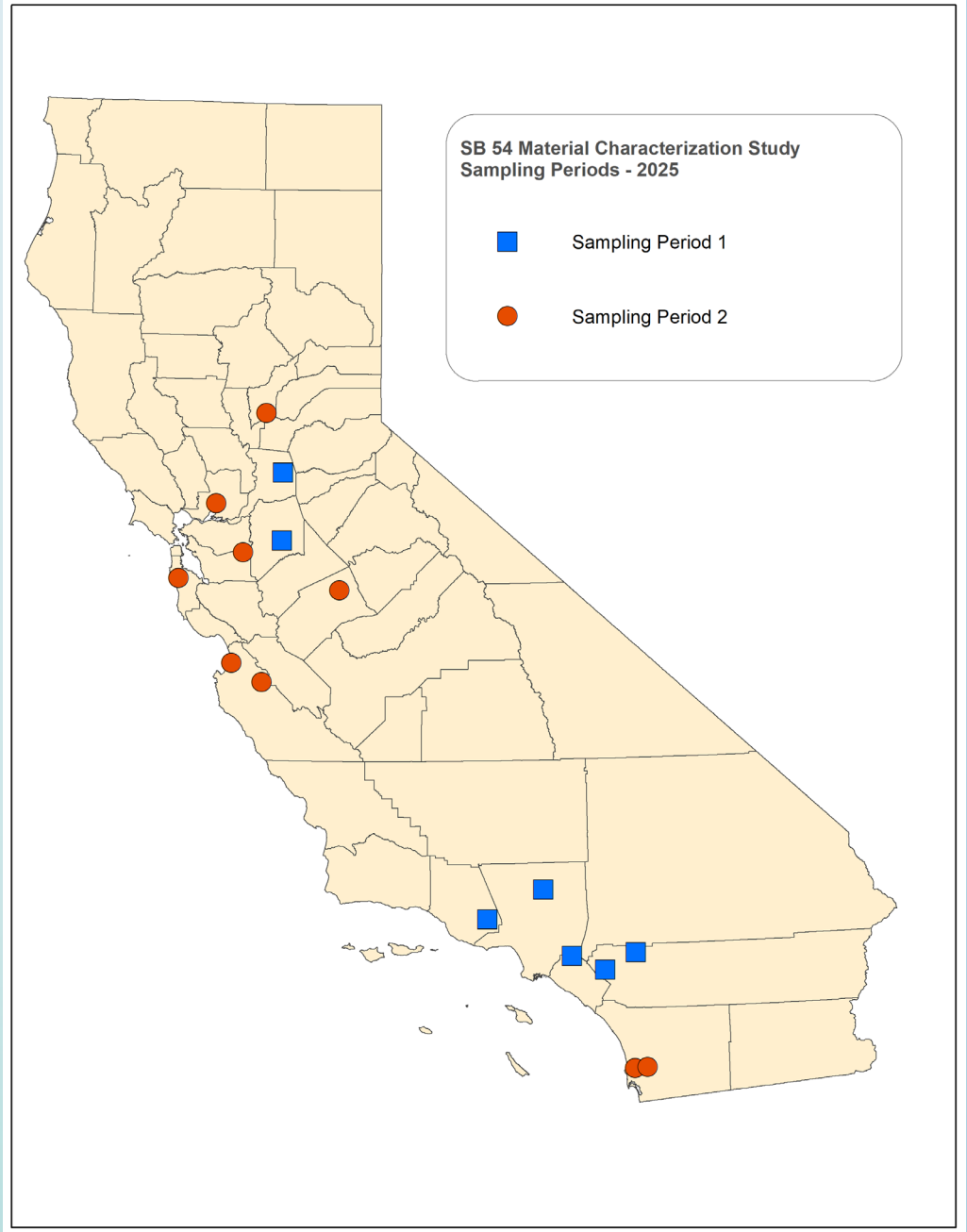
Study Methodology

Study Overview

- 2 sampling periods
  - 15 days of sampling during the first period
  - 19 days of sampling during the second period
- 16 landfills
- ~2 days at each landfill
  - Additional day at the first landfill for training
  - Duration varied by site depending on operational conditions and weather.
- 313 samples collected from all sectors

Study Site Selection

- Prioritized landfills with:
  - Higher proportion of the state's waste disposal stream
  - Largest annual inflow tonnage that received material from the four sectors



Field Methodology

- Samples collected from four sectors
  1. 83 Franchised single-family residential
  2. 140 Franchised commercial and multi-family residential
  3. 62 Self-hauled
  4. 28 Comingled waste (transfer trailer)
- Samples weighed at least 200 pounds
- Samples sorted into 83 categories based largely on covered material categories (CMCs)

4 Types of Material Sorting Categories

1. Covered material (67 total)
   - Packaging (plastic and non-plastic)
   - Single use food service ware
2. Potentially reusable alternatives to covered material (6 total)
3. Mixture classification (2 total)
   - Two categories specific to covered material that was discarded with the good or food still inside
4. Remainder material (i.e., all other material that is not covered under the Act) (8 total)
   - California Redemption Value (CRV) beverage containers
   - Grocery bags, trash bags, pet waste bag
   - Food and green waste
   - Mixed residue

Example of Field Sorting Process

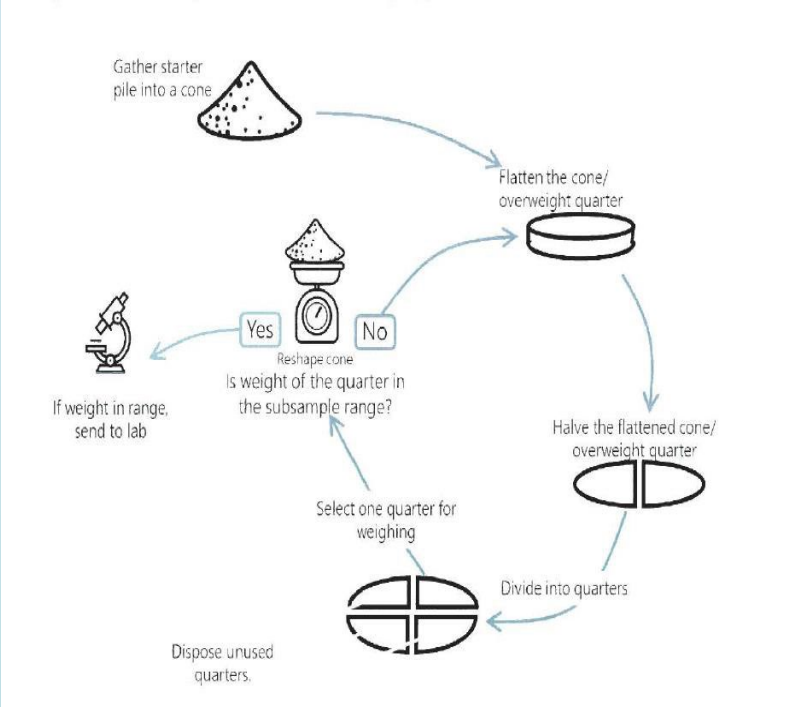
- "Glass Bottles and Jars that are covered material"
  - Glass Bottles and Jars with a plastic component (CMC Code 24_G1P)
  - Glass Bottles and Jars without a plastic component (CMC Code 24_G1N)
- Any glass received from Remainder / Composite given to the CalRecycle for a quality control sort.
  - Remainder glass includes CRV beverage container glass

Count	Class	Type	Form	Combined CMC Code
1	Glass	Glass	Bottles and Jars	24_G1N/P
2	Glass	Glass	Other Forms	24_G2N/P
4	Glass	Glass	Small – Two or more sides measuring 2" or less	24_G3N/P
3	Glass	Glass	Potentially Reusable Packaging and Food Service Ware	Potential Reuse
5	Glass	Glass	Remainder/Composite Glass	n/a
6	Ceramic	Ceramic	All Forms	24_C1N/P
8	Ceramic	Ceramic	Small – Two or more sides measuring 2" or less	24_C2N/P
7	Ceramic	Ceramic	Potentially Reusable Packaging and Food Service Ware	Potential Reuse

Additional Analysis Methodology

Additional Analysis: Covered Material Made of Plastic Hard-to-Identify Resin Type

- Covered material categories made of resin unidentifiable in the field :
  - Other/Mixed Plastics Rigid Items (CMC code 24_P35P) [527 items]
  - Other/Mixed Plastics Flexible and Film Items (CMC code 24_P35P) [563 items]
- Samples randomly collected from using Cone and Quarter Method
- Samples sent to an off-site lab for analysis using resin spectroscopy to identify the plastic resin type: PET (#1), HDPE (#2), PVC (#3), LDPE (#4), PP (#5), PS (#6), and other or unknown resins



Additional Analysis: Weight-to-Volume (Density) Methodology

- Contractor aggregated sorted categories of covered material
- Contractor recorded height and weight of sorted material in a container of known volume
- Weight-to-volume density - 51 covered materials
- Too rare to be considered- 16 covered materials

Additional Analysis: Covered Material Discarded with Good Still Inside

- For subset of samples for two sorting categories, contractor separated the covered material from the good still inside
  1. Food Discarded in Original Packaging or Food Service Ware (85 samples)
  2. Non-food Discarded in Original Packaging (78 samples)
- Examples
  - Can of beans – beans removed from metal can
  - Bottle of lotion – lotion removed from bottle
- Covered material with food/good inside
  - Removed good and cleaned covered material
  - Weight of covered material recorded by material class
- Data used to estimate proportional weight of covered material discarded in those two categories

Report Organization

Structure of Revised Preliminary Findings Report

- Background
- Methodology
  - Estimating Composition of Landfilled Material in California
- Summary of Findings
  - Estimates of Statewide Disposal of Covered Material
  - Additional Analysis:
    - Spectroscopic Analysis of Hard-to-Identify Resins
    - Weight-to-Volume conversion factors for certain covered materials

Changes from the Preliminary Findings Report (1 of 2)

Main Report

- Updated
  - Updated disposal tonnage of covered materials
  - Statistical analysis methods
- Added tables:
  - Estimated disposal of covered material, by material class
  - Weight-to-volume (density) measurements for categories containing covered materials

Changes from the Preliminary Findings Report (2 of 2)

Appendix 1

- Revised statistical analysis
  - Statistical modeling methodology
  - Confidence intervals added to tables
- Weight-to-Volume conversion factors for certain covered materials
  - Detailed methodology
  - Weight-to-volume conversion factor table
  - Rare material categories not analyzed for weight-to-volume conversion factor measurements

Appendix 2

- Public comments received from June 30, 2025 through Sept.15, 2025

Part 4. Revised Preliminary Findings

Department of Resources Recycling and Recovery
Knowledge Integration Section

Travis Dennis
Environmental Scientist, Knowledge Integration Section

Revised Report Findings

- 8,457,149 tons of covered material were disposed of in California in 2024
- Representing about 21.1% of the state's total landfill disposal

Estimates of Statewide Disposal of Covered Material Classes in 2024

Material Class	Average (mean) annual disposal (statewide tons)	Proportion of total statewide disposal	Proportion of covered material disposal
Paper and Fiber	3,929,375	9.81%	46.46%
Plastic	3,123,797	7.80%	36.94%
Wood and Other Organic Materials	811,999	2.03%	9.60%
Metal	432,265	1.08%	5.11%
Glass	154,149	0.39%	1.82%
Ceramic	5,564	0.01%	0.07%
Total	**8,457,149**	**21.12%**	**100%**

Top 5 Disposed CMCs

Material Class	Material Type	Material Form	Annual disposal estimate (statewide tons, mean)	Estimated Proportion of Total Statewide Disposal
Paper and Fiber	OCC	Cardboard	2,042,929	5.10%
Wood and Other Organic Materials	Wood	All Untreated Forms	703,062	1.76%
Plastic	Other/Mixed Plastics	Flexible and Film Items	650,085	1.62%
Paper and Fiber	Multi-Material Laminate	Other Forms	549,429	1.37%
Paper and Fiber	Paperboard	All Forms	487,428	1.22%

Top 5 Plastic CMCs

Combined CMC Code	Material Class	Material Type	Material Form	Annual disposal estimate (statewide tons, mean)	Estimated Proportion of Total Statewide Disposal
24_P36P	Plastic	Other/Mixed Plastics	Flexible and Film Items	650,085	1.62%
24_P41P	Plastic	PP (#5)	Other Rigid Containers, Cups, Lids, Plates, Trays, and Tubs	371,670	0.93%
24_P16P	Plastic	LDPE (#4)	Other Flexible and Film Items	290,978	0.73%
24_P15P	Plastic	LDPE (#4)	Clear Non-Bag Film	263,481	0.66%
24_P38P	Plastic	PET (#1)	Other Rigid Containers, Cups, Lids, Plates, Trays, and Tubs	204,712	0.51%

Top 5 Metal CMCs

Combined CMC Code	Material Class	Material Type	Material Form	Annual disposal estimate (statewide tons, mean)	Estimated Proportion of Total Statewide Disposal
24_M6N/P	Metal	Tin/Steel/Bimetal	Non-aerosol Containers	137,393	0.34%
24_M2N/P	Metal	Aluminum	Foil Sheets	66,305	0.17%
24_M8N/P	Metal	Tin/Steel/Bimetal	Other Forms	44,148	0.11%
24_M7P	Metal	Tin/Steel/Bimetal	Aerosol Can	38,929	0.10%
24_M3N/P	Metal	Aluminum	Foil Molded Containers	32,213	0.08%

Top 5 Paper/Fiber CMCs

Combined CMC Code	Material Class	Material Type	Material Form	Annual disposal estimate (statewide tons, mean)	Estimated Proportion of Total Statewide Disposal
24_PF9N/P	Paper and Fiber	OCC	Cardboard	2,042,929	5.10%
24_PF7P	Paper and Fiber	Multi-Material Laminate	Other Forms	549,429	1.37%
24_PF10N/P	Paper and Fiber	Paperboard	All Forms	487,428	1.22%
24_PF1N/P	Paper and Fiber	Kraft Paper	All Forms	289,887	0.72%
24_PF14N/P	Paper and Fiber	Molded Fiber	All Forms	163,462	0.41%

Top 5 Wood and Other Organic Materials CMCs

Combined CMC Code	Material Class	Material Type	Material Form	Annual disposal estimate (statewide tons, mean)	Estimated Proportion of Total Statewide Disposal
24_WO1N/P	Wood and Other Organic Materials	Wood	All Untreated Forms	703,062	1.76%
24_WO2N/P	Wood and Other Organic Materials	Wood	All Treated or Painted Forms	87,378	0.22%
24_WO6N/P	Wood and Other Organic Materials	Wood and Other Organic Materials	Small - Two or more sides measuring 2" or less	9,804	0.02%
24_WO3N/P	Wood and Other Organic Materials	Other/Mixed Organic	Textiles	6,386	0.02%
24_WO4N/P	Wood and Other Organic Materials	Other/Mixed Organic	Other Forms	5,369	0.01%

Top 3 Glass CMCs

Combined CMC Code	Material Class	Material Type	Material Form	Annual disposal estimate (statewide tons, mean)	Estimated Proportion of Total Statewide Disposal
24_G1N/P	Glass	Glass	Bottles and Jars	130,502	0.33%
24_G3N/P	Glass	Glass	Small - Two or more sides measuring 2" or less	14,398	0.04%
24_G2N/P	Glass	Glass	Other Forms	9,249	0.02%

Top 2 Ceramic CMCs

Combined CMC Code	Material Class	Material Type	Material Form	Annual disposal estimate (statewide tons, mean)	Estimated Proportion of Total Statewide Disposal
24_C2N/P	Ceramic	Ceramic	Small - Two or more sides measuring 2" or less	4,391	0.01%
24_C1N/P	Ceramic	Ceramic	All Forms	1,172	0.00%

Part 5. Next Steps

Department of Resources Recycling and Recovery
Knowledge Integration Section

Dan Brown

Dan Brown, Branch Chief / Acting Policy Director,
Policy Development and Analysis Office

Next Steps

Public Comments

- Written feedback may be submitted to wastechar@calrecycle.ca.gov with subject line "*SB 54 Revised Preliminary Findings*".
- Members of the public are requested to submit public comments, by **Wednesday November 12, 2025**

Final Publication

- 60 days after the formal public meeting, publish SB 54 MCS by December 27, 2025

Next Study

- Update to the SB 54 MCS is required in 2028

Part 6. Questions and Public Comments

Department of Resources Recycling and Recovery
Knowledge Integration Section

Marcus Santillano
Environmental Program Manager, Packaging EPR Section

Public Comments (2 of 2)

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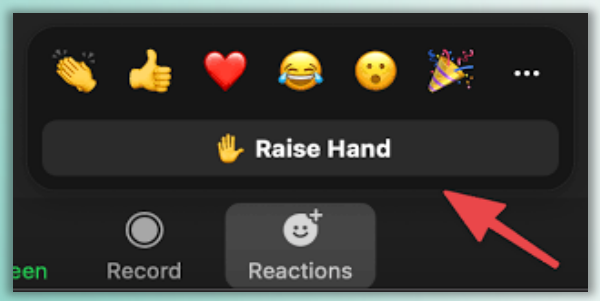

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