

PFAS and Beneficial Reuse of Biosolids in Colorado

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What are Biosolids?

- Biosolids are a product of the **domestic** wastewater treatment process
- During wastewater treatment, the liquids are separated from the solids
- The organic solids are then treated physically and chemically to produce a semisolid, nutrient-rich product known as biosolids



Beneficial Reuse of Biosolids

- Biosolids that are beneficially reused must meet state and federal requirements
- Benefits of applying biosolids to land include the following:
 - Nutrient addition
 - Improved soil structure
 - Water reuse
 - Conservation of landfill space, reduction of greenhouse gases
 - Reduced demand on non-renewable resources such as phosphorus
 - Reduced demand on synthetic fertilizers

Beneficial Reuse of Biosolids in Colorado

- In 2018, 79,300 dry metric tons of biosolids were beneficially used or disposed of in Colorado
- 86% was beneficially used, with 80% used on 225,000 acres of agriculture land
- Colorado State University and the USGS have conducted leading research on biosolids land application, advancing understanding of use for dryland wheat and other crops



Other Disposal Options for Biosolids

Landfill

- Increase organic waste in landfills
- Organic waste that breaks down in landfills gets trapped without air and gives off methane
- Methane is a potent greenhouse gas which contributes to climate change
- For example, composting 75% of California's organic waste is equal to 1,000,000 vehicles off the road each year

Incineration

- Negatively impact air quality
- Does not destroy PFAS results in air emissions
- Particulate emissions
- NO_x, SO_x, and CO₂
- Need supplemental fuel

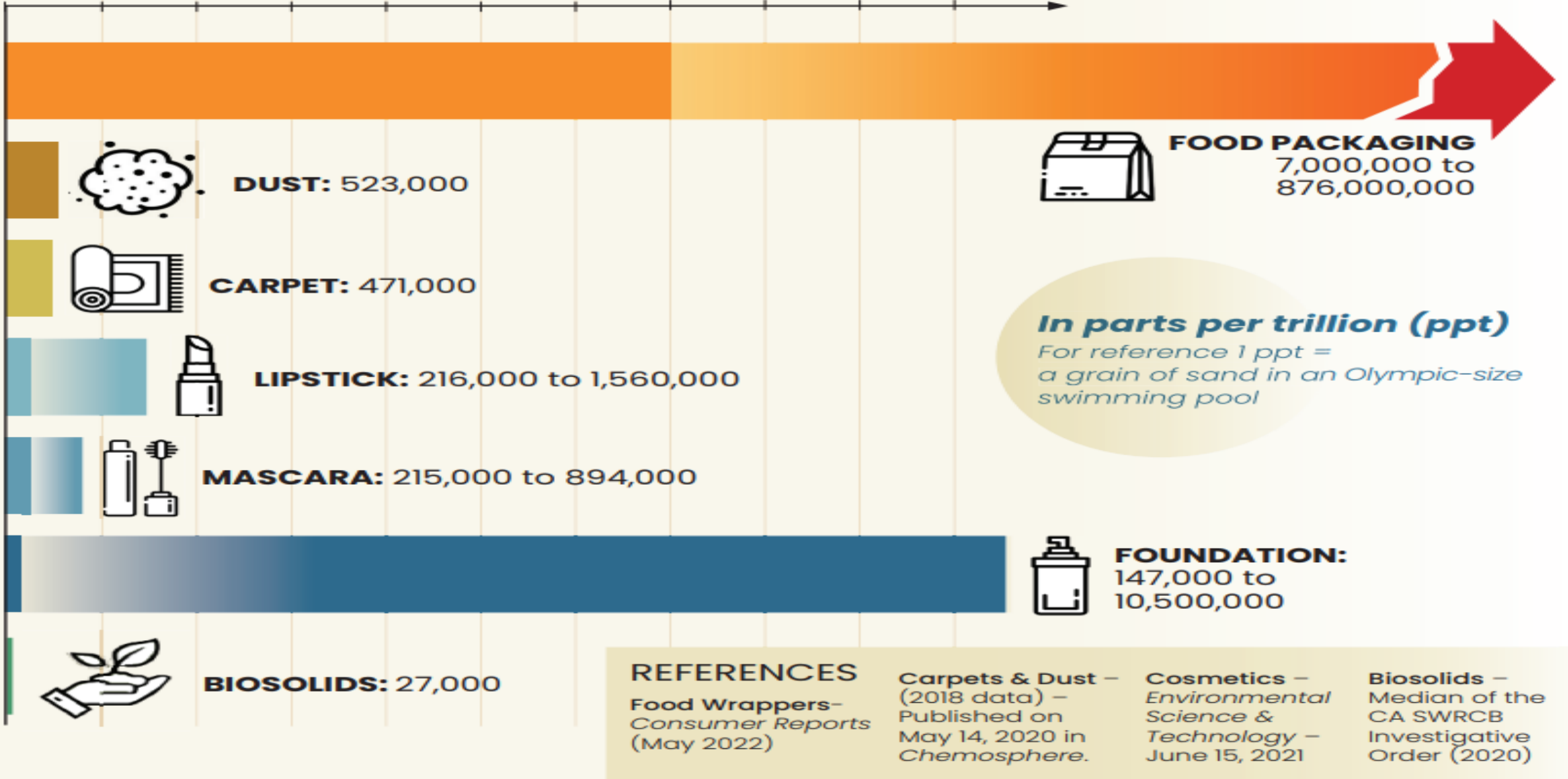
PFAS

- Per and polyfluoroalkyl substances (PFAS) are a group of human-made chemical compounds found in numerous products used in everyday life, such as carpets and rugs, cosmetics, paper packaging for food, nonstick cookware, water repellent clothing
- PFAS have been in commercial use since the 1940's and are abundant in today's society
- These chemicals are widely in use because of their exceptional resistance to heat, water and oil



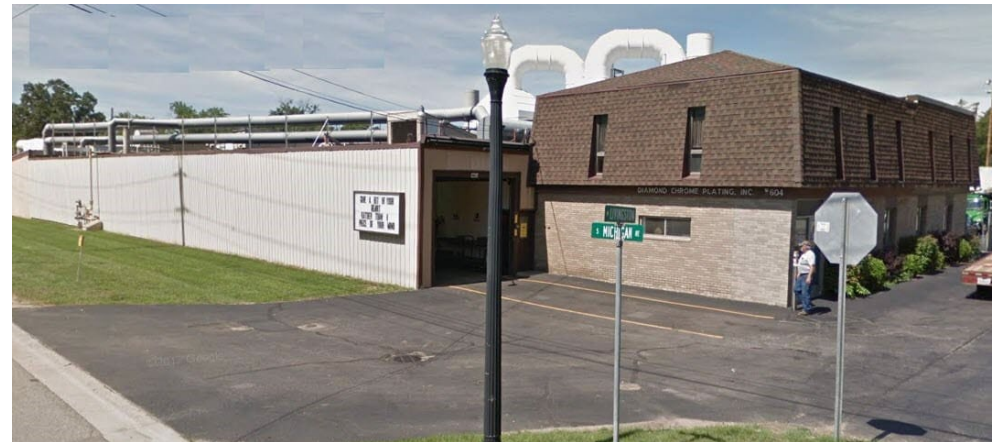
RELATIVE RANGES in parts per trillion

0 1,000,000 2,000,000 3,000,000 4,000,000 5,000,000 6,000,000 7,000,000 8,000,000 9,000,000 10,000,000



Comparison with other states

- Colorado does not allow industrial sludge land application
- Maine allowed use of sludge from pulp and paper manufacturer
- Michigan found elevated PFAS concentrations from chrome plating industry



How Colorado Regulates Biosolids

Colorado limits biosolids to **domestic** wastewater treatment residuals and **does not** include commercial or industrial sludges

Definition in C.R.S. 25-8-103(1.4) and Regulation 64

- “Biosolids” means the accumulated residual product resulting from a **domestic** wastewater treatment works or other domestic sources. “Biosolids” does not include grit or screenings from a wastewater treatment works or commercial and industrial septage or on-site wastewater treatment systems...”
- “Domestic wastewater treatment works” does not include plants whose primary function is treatment of industrial wastes, therefore sludges from industrial treatment facilities are not “biosolids”

Water Quality Control Commission Regulation 64 controls land application of biosolids:

- Monitoring requirements
- Limits on pollutant concentrations in biosolids
- Setbacks from waterbodies and minimum depth to groundwater

Colorado's Ongoing Work

- Supported HB22-1345 to eliminate PFAS at the source
- CO Wastewater Utility Council supporting nationwide collaborative Biosolids PFAS Research project sponsored by University of Arizona
- EPA has released a road map to complete a risk assessment for PFAS in biosolids that will include the following:
 - Review of publicly available information on occurrence, fate and transport
 - Deterministic risk assessment across chemicals detected in biosolids
 - Refined probabilistic assessment for pathways and receptors of concern
- Water Quality Forum & WQCD stakeholder process to address PFAS in biosolids with public, environmental groups and WWTPs participating
 - Monitoring
 - Source identification and control

Recommendations

- Continue to support Colorado's ongoing work including the stakeholder processes to address PFAS in biosolids
- Legislation to address PFAS in biosolids is not warranted at this time

Thank you!
Questions or Comments?

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