BACKGROUND INFORMATION FOR THE 2019 VERMONT SINGLE-USE PRODUCTS WORKING GROUP

PRODUCED BY:
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DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
SOLID WASTE PROGRAM

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*This summary provides background information for the Single-Use Products Working Group's duties 1, 2, and 3 (as required by Act 69). It **does not** include all the existing information on these topics.*

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BACKGROUND

Act 69 (S.113 of 2019) requires the Single-Use Products Working Group to do the following:

(1) Current System: Evaluate the success of existing State and municipal requirements for the management of unwanted single-use products, including a lifecycle analysis of the management of single-use products from production to ultimate disposition.

(2) Landfill Capacity: Estimate the effects on landfill capacity of single-use products that can be recycled but are currently being disposed.

(3) Environmental Impacts: Summarize the effects on the environment and natural resources of failure to manage single-use products appropriately, including the propensity to create litter and the effects on human health from toxic substances that originate in unwanted single-use products.

(4) Methods for Improvements: Recommend methods or mechanisms to address the effects on landfill capacity of single-use products that can be recycled, but are currently being disposed, in order to improve the management of single-use products in the State, including whether the State should establish extended producer responsibility or similar requirements for manufacturers, distributors, or brand owners of single-use products.

(5) EPR: If extended producer responsibility or similar requirements for single-use products are recommended under subdivision (4) of this subsection, recommend:

(A) The single-use products to be included under the requirements.

(B) A financial incentive for manufacturers, distributors, or brand owners of single-use products to minimize the environmental impacts of the products in Vermont. The environmental impacts considered shall include review of the effect on climate change of the production, use, transport, and recovery of single-use products.

(C) How to structure a requirement for manufacturers, distributors, or brand owners to provide for or finance the collection, processing, and recycling of single-use products using existing infrastructure in the collection, processing, and recycling of products where feasible.

(6) Affordability of Reusable Bags: Recommend methods or incentives for increasing the availability and affordability of reusable carryout bags for all citizens in Vermont.

(7) Cost-Benefits of Any Recommendation: An estimate of the costs and benefits of any recommended method or mechanism for improving the management of single-use products in the State.

1. CURRENT SINGLE-USE SYSTEM

"(1) Evaluate the success of existing State and municipal requirements for the management of unwanted single-use products, including a lifecycle analysis of the management of single-use products from production to ultimate disposition."

A. STATE REQUIREMENTS

I. Vermont's Universal Recycling Law Summary:

- **a.** Everyone in Vermont must recycle:
  - **i.** Paper, Boxboard, and Cardboard: uncoated, clean, and dry
  - **ii.** Containers: from food and drinks including Metal cans, foil, and pie tins, Glass bottles and jars, Plastic bottles and containers labeled #1 and #2
- **b.** Trash haulers and drop-off centers must offer recycling collection.
- **c.** Haulers must charge residents a single, bundled fee for trash and recycling.
- **d.** Residential trash charges must be based on volume or weight.
- **e.** Public entities must pair each of their trash bins with a recycling bin (except restrooms).

B. MUNICIPAL REQUIREMENTS

I. Brattleboro: The town's ordinance, which went into effect July 1, 2018, prohibits the distribution of plastic bags that do not meet their definition of *reusable*. [1]

II. Chittenden County:

- **a.** Every public-facing trash can must be paired with a recycling bin (except restrooms).
- **b.** Landlords, property managers, and condo/homeowner associations must inform residents about waste management requirements annually. Landlords that provide trash collection for tenants must provide recycling collection at least once a month.
- **c.** Event and venue managers that register vendors or participants must explain CSWD's recycling requirements as part of the registration and require compliance with the requirements as a condition of the reservation or permit.
- **d.** Commercial haulers must provide recycling collection at least monthly to all trash customers and provide recycling collection to all short-term trash customers (specific exemptions available). Commercial haulers must provide recycling instructions to new customers and at least annually. The recycling bins they provide must be colored and labeled according to the ordinance requirements. [2]

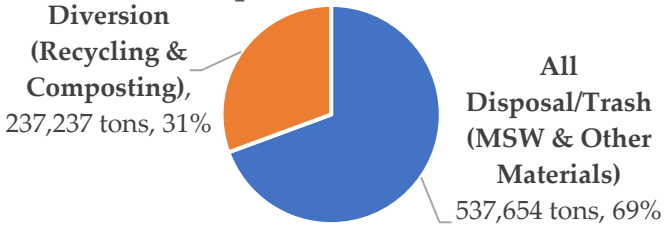
III. District Recycling Ordinances: Several solid waste districts had mandatory recycling requirements for years before the Vermont Universal Recycling Law passed and was implemented.

C. VERMONT'S WASTE & RECYCLING SYSTEM

I. Generation:

Vermonters generate a host of waste materials every year, including trash, construction and demolition debris, recyclables, food waste, sludge, and more. In 2018, Vermont generated ~775,000 tons of solid waste from residents, businesses, and institutions (see Fig. 1). [3]

Fig. 1. Vermont Generated Solid Waste Materials - trash, recycling, compost, etc. (2018)



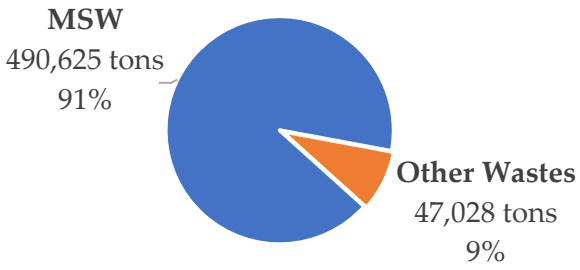
II. What's in Our Trash?

a. The majority of Vermont's disposed waste is Municipal Solid Waste (MSW), which is trash from residences, businesses, and institutions (Fig. 2).

b. "Other wastes" includes contaminated soils, sludge, construction and demolition waste (C&D), and more. [3]

c. Every five years, DEC contracts a Waste Characterization Study to find out what's in Vermont's trash (MSW) by percentages.

Fig. 2. Vermont Generated Waste - All Disposal/Trash (landfilled or incinerated) (2018)

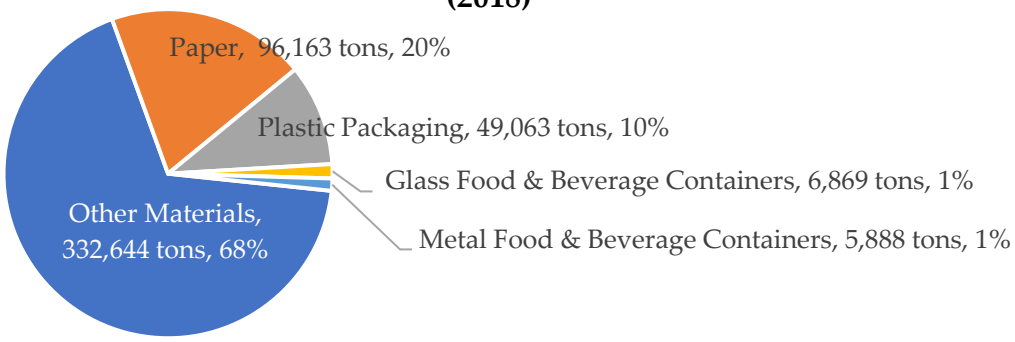


d. From this study, DEC estimates:

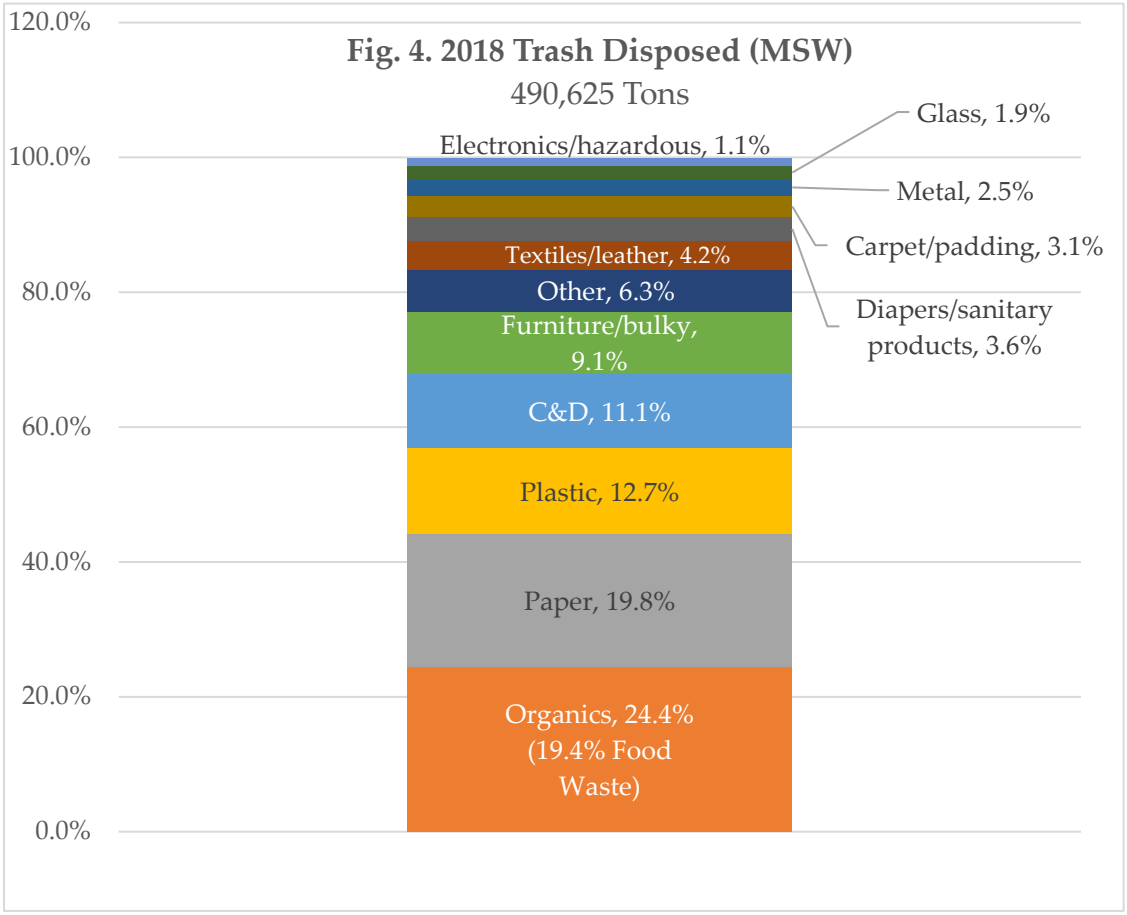
- **Single-use items, paper, and packaging make up an estimated 32% of Vermont MSW (see Fig. 3. below).**
- Single-use items that **can be recycled via single or dual stream collection (if clean) but are currently disposed** make up an estimated **14%** of Vermont's MSW.

e. The study authors, DSM Environmental, estimate that plastics disposal has increased in Vermont and elsewhere and that if they studied the volume of trash, rather than the weight, plastic would be the most prevalent material. They also noted a "decrease in the weight of paper recyclables" in the trash, dropping from 17% of the trash in 2002 to 9% in 2017. [4]

Fig. 3. Single-Use Products, Packaging, and Paper in Vermont MSW Disposed (2018)



III. Vermont 2018 Residential and Commercial Trash: [4] [5]

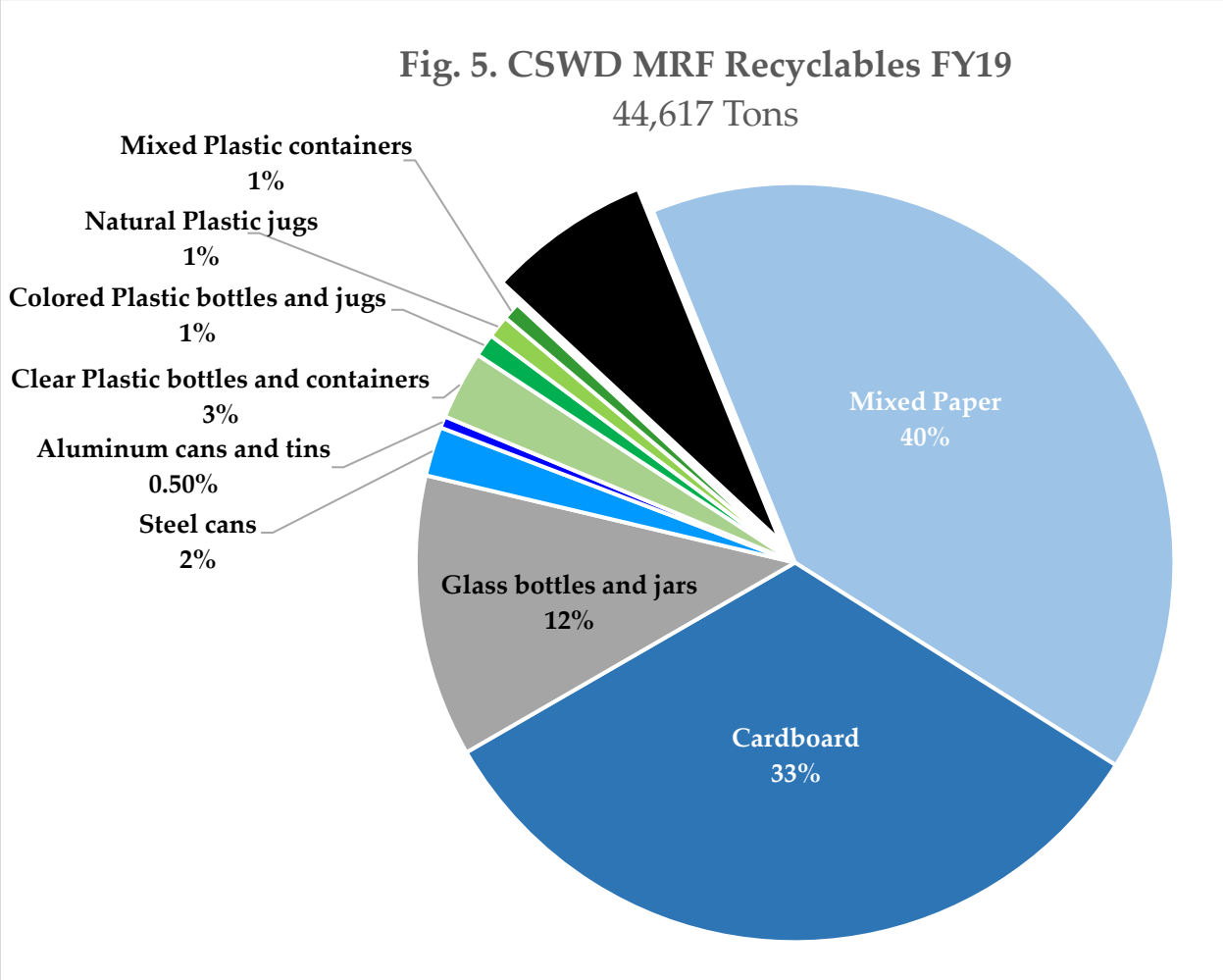


*C&D refers to Construction and Demolition Debris

Category of Material	Percent of Waste Stream	Tons Trash (MSW) Disposed 2018
Organics	24.4%	119,713
Paper	19.8%	97,144
Plastic	12.7%	62,309
C&D*	11.1%	54,459
Furniture/bulky	9.1%	44,647
Other	6.3%	30,909
Textiles/leather	4.2%	20,606
Diapers/sanitary products	3.6%	17,663
Carpet/padding	3.1%	15,209
Metal	2.5%	12,266
Glass	1.9%	9,322
Electronics/hazardous	1.1%	5,397
TOTAL:	100.0%	490,625

IV. What's in Our Recycling?

Fig. 5. below shows the 2019 fiscal year recyclables data from the Chittenden Solid Waste District's (CSWD's) Materials Recovery Facility (MRF) in Williston, Vermont. [6]



V. What About Compostable Single-Use Products (SUPs)?

Most Vermont composting facilities do not accept certified compostable packaging, utensils, or bags. Some of the largest municipal composting facilities, including Green Mountain Compost (CSWD) and Windham Solid Waste District's composting facility, do accept certain kinds of compostable single-use items [7] [8]. The compost facilities that do accept these products must navigate their complexity, such as: false claims of compostability or biodegradability, consumer confusion over claims and colors, emerging contaminants (e.g. PFAS—see page 15), paper coatings, and more.

D. SUCCESSES

I. **<u>Vermonters Recycle:</u>** In 2017, Vermont recycled an estimated 141,000 tons of blue bin recyclables. This is slightly more tons than 2016, even though packaging continued to get lighter. [3] People in Vermont recycle an estimated 72% of mandated recyclables (recyclable paper, cardboard and containers). [4]

II. **<u>The Universal Recycling Law is working</u>** to:

a. Increase food scrap composting: In 2017, Vermont composting facilities collected more food scraps than ever before, a 9% increase from 2016.

b. Increase recycling of blue bin recyclables (see I. above)

c. Increase recycling and composting convenience throughout Vermont. More hauling and drop-off collection services exist because of the law.

d. Food rescue donations to the Vermont Foodbank almost tripled from 2014-2017.

III. **<u>Recycling Saves Energy and Reduces Greenhouse Gases (GHGs).</u>** On average:

- **a.** Recycling one ton of **aluminum** cans saves 152.76 million BTUs of energy or 9.11 MTCO2E GHG emissions.
- **b.** Recycling one ton of **plastic bottles** (PET) saves 31.87 million BTUs energy or 1.12 MTCO2E GHG emissions.
- **c.** Recycling one ton of **mixed paper** saves 22.81 million BTUs of energy or 3.98 MTCO2E GHG emissions.
- **d.** Recycling one ton of **steel** cans saves 19.97 million BTUs of energy or 1.81 MTCO2E GHG emissions.
- **e.** Recycling one ton of **cardboard** saves 9.97 million BTUs energy or 3.12 MTCO2E GHG emissions.
- **f.** Recycling one ton of **glass bottles & jars** saves 2.39 million BTUs of energy or 0.30 MTCO2E GHG emissions. [9]

E. CHALLENGES

I. **<u>Vermont Continues to Produce Lots of Trash, Recyclables, and Compost:</u>**
While Vermont's Universal Recycling Law has increased recycling and composting, Vermont continues to generate ~600,000 tons of unwanted materials (MSW) and recycle/compost about 35% of it each year (in last five years). The remaining ~65% was disposed in the trash.

In 2017, trash disposal increased 11% following a two-year decrease of 9%. [3] In 2018, disposal increased another 4.5%. Since diversion increased as well **in 2018, Vermont generated more MSW in 2018 than any other year in the last decade.** Vermont currently has a goal to recycle, compost, and reuse 50% of all materials by 2020. [5] Not all disposed materials can be diverted from the landfill with current technologies and priorities.

II. Managing Vermont's Materials is Costly: Vermonters, municipalities, businesses, and haulers pay the costs to dispose and recycle single-use products, paper, and packaging.

a. **Trash Costs:** Trash costs vary widely depending on market competition, distance to the landfill or incinerator, the type of customer (resident, business, hauler), and whether someone hauls it themselves or uses a curbside hauler. Anecdotally, landfill/incinerator tipping fees for trash are generally between $70-115 per ton in 2019. [10] Tipping fees refer to the cost haulers pay when they "tip" their waste at the landfill or incinerator.

b. **Recycling Costs:** With the downturn in recycling markets and recycling costs have increased making it more expensive. Anecdotally, recycling costs are now approaching or may be exceeding the cost of trash disposal in some parts of Vermont, with tipping fees at the two large single-stream Material Recovery Facilities (MRFs) at approximately $65/ton (Williston/CSWD MRF) and approximately $90/ton (Rutland MRF). Town transfer stations report costs to haul recyclables ranging from $76-308 per ton in 2019. [10] Other examples of recycling costs include:
    i. Danby Transfer Station, April 2019: Trash cost $145.91 per ton. Recycling cost $175.40 per ton. [11]
    ii. Rutland MRF tip fee set at $88.95/ton as of April 2019. Disposal fee set at $89.27/ton. [11]
    iii. CSWD's MRF tip fee reached all time high of $65/ton on July 1, 2019. [12]

III. Single-Use Product Challenges: Reducing or avoiding the use of SUPs and increasing recycling or composting of SUPs that are unavoidable can be challenging. Addressing litter, when SUPs are not properly disposed or recycled, also presents challenges.

a. **Avoiding SUPs is Challenging:** Even when consumers try to avoid packaging or excessive packaging, it can be challenging to find alternatives. Sometimes the low-waste alternatives, like buying in bulk, can cost more.

b. **Knowing How to Recycle is Challenging:** People struggle to sort their packaging correctly—especially as new materials enter the marketplace. Packaging is often labelled with confusing or locally incorrect recycling instructions. To address this issue, some brands have adopted How2Recycle labels, which provide more information, including whether consumers need to ask their local recycling program if they accept the material in question. [13]

c. **Recycling Glass is Challenging:** Single use glass containers are especially challenging to recycle in Single-Stream Material Recovery Facilities (MRFs) where they have low value and can contaminate other recyclables when comingled in single stream recycling systems.

d. **Litter is Still a Problem:** Litter continues to be a problem in Vermont, nationally, and globally. This includes large items and microplastics. [14] [15]

F. LIFE CYCLE ANALYSES/ASSESSMENTS

Life cycle assessments (LCAs) study and explain a material's impact from creation to end-of-life, including:

- Material extraction/production
- Manufacturing
- Transportation (of materials and finished product)
- Consumer use (number of times used before disposal)
- End-of-life (landfilling, recycling, composting, etc.)

LCAs can be a useful tool for considering environmental impacts but typically only focus on certain impacts and exclude others.

Some LCAs are funded by business interests that could benefit from certain results [16].

Life cycle assessments may consider (not all categories addressed by every study):

- Greenhouse gasses (climate)
- Water consumption
- Energy consumption
- Fossil fuel consumption
- Soil pollution
- Freshwater/marine eutrophication
- Toxicity (to humans/ecosystems)
- Acid Rain
- Ozone formation
- Impact on solid waste stream

They typically do not consider:

- Consequences of mismanagement, such as:
  - Litter and its impacts on: [17]
    - The economy (e.g. costs to clean up, public health costs, impacts on fishing, tourism, etc.) [38]
    - The environment: water, land, etc.
    - Public Health
    - Other species (e.g. harming wildlife)
- Other priorities, such as:
  - Reducing reliance on landfills & incinerators
  - Building a circular economy
  - Creating jobs in reuse/recycling industries

Anne Johnson, from Resource Recycling Systems, a consulting firm focused on resource recovery, and *Greg Norris,* from the Harvard School of Public Health and International Living Future Institute, wrote in 2018 that "While LCA is an effective tool for comparative analysis of products and packaging across common measures, to omit the impacts of mismanaged plastics is an important blind spot that needs urgently to be addressed. In the meantime, it is clear that LCAs today are not providing the whole picture.... [LCAs] are only as good as the data that underlies the analysis and the categories of impact evaluated... The data missing from most LCA-based conclusions about product life cycles include such realities as poorly designed landfills, open dumping, low-tech incineration, open burning, storm events, accidents and spills, and just plain litter." [17]

The number of times an item is reused majorly impacts the per-use life cycle impact of reusable products.

Oregon DEQ's research on how different characteristics (e.g. recyclable, compostable) relate to packaging's life cycle impacts found that:

- Items made with recycled content typically have lower environmental impacts than a version of that item made without recycled content.
- Recycled content is not a good predictor of lower impacts when comparing items made of different materials, such as glass vs. PET plastic.

- "Biobased" is an unreliable characteristic for assessing life cycle impact largely because growing, harvesting, transporting, and processing the feedstocks tend to have substantial impacts. For example, some biobased packaging may produce fewer GHG emissions but more acid rain, eutrophication, and toxicity impacts.
- "Recyclable" does not consistently align with lower life cycle impacts because different material types have such different impacts and the characteristic of "recyclable" does not consider material type.
- Being compostable does not appear to predict lower life cycle impacts, partly because compostable products are generally biobased and thus include the impacts of growing, harvesting, transporting, and processing the feedstocks. [18]

2. LANDFILL CAPACITY

"Estimate the effects on landfill capacity of single-use products that can be recycled but are currently being disposed."

A. COVENTRY LANDFILL

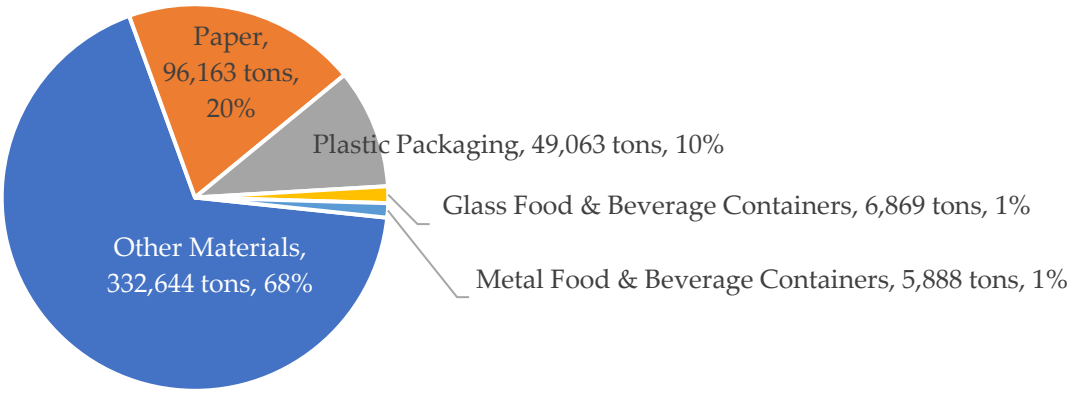
The Coventry landfill's current footprint is 71 acres and the expansion would add an additional 51 acres. The landfill is currently permitted to dispose of 600,000 tons a year. It currently disposes ~500,000 a year. If it continues to fill at this rate, the expanded landfill would be expected to reach capacity in 2042.

B. EFFECTS OF SINGLE-USE PRODUCTS

Single-use items make up an estimated 32% of Vermont MSW disposed (see Fig. 3), according to the 2018 Vermont Waste Characterization Study. In 2018, this amounted to **over 155,000 tons** of material. With our current recycling and composting system, not all these materials can be recycled/composted.

Single-use items that **can be recycled via single or dual stream collection (if clean) but are currently disposed** make up an estimated **14%** of Vermont's MSW. In 2018, this amounted to **almost 66,000 tons** of waste.

Fig. 3. Single-Use Products, Packaging, and Paper in Vermont MSW Disposed (2018)



3. ENVIRONMENTAL IMPACTS

"Summarize the effects on the environment and natural resources of **failure to manage single-use products appropriately**, including the propensity to create **litter** and the **effects on human health from toxic substances** that originate in unwanted single-use products."

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A. THE EXTENT OF LITTER

Biodegradable litter, like uncoated paper or cardboard, can impact aesthetics until it decomposes. All plastic litter, both large and small, can cause damage. Plastic litter pollutes the land, air, and water, where it breaks into smaller and smaller pieces known as microplastics. Some sources of litter, such as laundering synthetic clothing, release microplastics but not larger pieces of plastic. A growing body of research has found microplastic pollution throughout the planet, and even in the most remote locations, including rain and groundwater in the US, snow in France, arctic sea ice and deep-sea sediments, the deepest ocean trench on earth, and elsewhere. [19] [20] [21] [22] [23] [24]

Locally, Green Up Day Vermont collects 200 to 300 tons of litter each year. [14]

Nationally, scientists estimated that almost 300,000 metric tons of plastic debris entered the ocean from the United States in 2010. [25]

Globally:

- Humans produce ~300 million tons of plastic waste (recycled, disposed, or discarded) each year. Some estimate that half this waste is single-use products. [26] [27]
- BBC (British Broadcasting Corporation) estimated that if these 300 million tons of plastic were compressed into bales, loaded the bales into shipping containers until full, and lined up the containers end-to-end, they would encircle the planet almost ten times. [28]
- Plastic items like bags, bottles, and cutlery can take centuries or even 1,000 years to decompose. If not managed properly these items or the plastic might end up in the environment. [29]
- Scientists estimated that 5-13 million metric tons of plastic entered the ocean in 2010. Without waste management improvements, that number is expected to increase by an order of magnitude by 2025. [25]

B. PLASTIC HARMS WILDLIFE

I. **Physically:** Plastic litter injures and kills wild animals when they eat it, get stuck in it, or the item wounds them. Hundreds of species are harmed by plastics, even animals that live in deep-sea ocean trenches. [30] [24] As part of *National Geographic*'s "Plastic or Planet" series, Elizabeth Royte explains, "Experiments show that microplastics damage aquatic creatures, as well as turtles and birds: They block digestive tracts, diminish the urge to eat, and alter feeding

behavior, all of which reduce growth and reproductive output. Their stomachs stuffed with plastic, some species starve and die." [30] The Ocean Conservancy includes plastic bags, utensils, balloons, and bottle caps on their list of "The Deadliest Ocean Trash." [31]

II. **Chemically:** Royte continues, "Microplastics have chemical impacts, because free-floating pollutants that wash off the land and into our seas—such as polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and heavy metals—tend to adhere to their surfaces." "Another experiment demonstrated that oysters exposed to tiny pieces of polystyrene—the stuff of take-out food containers—produce fewer eggs and less motile sperm." [30]

C. HUMAN HEALTH CONCERNS

I. **Life Cycle of Single-Use Plastics:** A coalition of NGOs and academic partners published *Plastic and Health: The Hidden Costs of a Plastic Planet* in February 2019. The key findings include:

- "**Plastic requires a lifecycle approach.**
- **At every state of its lifecycle, plastic poses distinct risks to human health**, arising from both exposure to plastic particles themselves and associated chemicals. The majority of people worldwide are exposed at multiple stages of this lifecycle [including:]
  - **Extraction and Transport of Fossil Feedstocks for Plastic**... particularly the use of hydraulic fracturing for natural gas...Over 170 fracking chemicals that are used to produce the main feedstocks for plastic have known human health impacts, including cancer, neurotoxicity, reproductive and developmental toxicity, impairment of the immune systems, and more.
  - **Refining and Production of Plastic Resins and Additives**... releases carcinogenic and other highly toxic substances into the air.
  - **Consumer Products and Packaging**. Use of plastic products leads to ingestion and/or inhalation of large amounts of microplastic particles and hundreds of toxic substances with carcinogenic, developments, and endocrine disrupting impacts.
  - **Toxic Releases from Plastic Waste Management**... plastic waste technologies (including incineration, co-incineration, gasification, and pyrolysis) result in the release of toxic metals such as lead and mercury, organic substances (dioxins and furans), acid gases, and other toxic substances.
  - **Cascading Exposure as Plastic Degrades**... As plastic particles continue to degrade, new surface areas are exposed, allowing leaching of additives from the core to the... environmental and human body.
- **Uncertainties and knowledge gaps undermine the full evaluation of health impacts, [including:]**
  - **Extreme lack of transparency** of the chemicals in most plastic and its production
  - **Intersecting Exposures and Synergistic Effects**
  - **Plastics in the Food Chain**
  - **Plastic in People"** [32]

II. **Microplastics:** Scientist do not completely understand how microplastics effect human health. Yet, the European Commission's chief scientific advisors wrote in an April 2019 report that "Growing scientific evidence on the hazards of the uncontrolled, irreversible, and long-term ecological risks due to microplastics do exist for some coastal waters and sediments. Scientists predict that, if emissions to the environment continue at the current rate or increase, ecological risks could be widespread within a century... there are significant grounds for concern and for precautionary measures to be taken." [33]

a. Human Consumption: One study estimated that United States residents eat, drink, and breathe 78,000-125,000 microplastic pieces each year. These are probably under-estimates. [34] Studies have found microplastics in both bottled and tap water. [32]

Royte explains, "Studying the impacts of marine microplastics on human health is challenging because people can't be asked to eat plastics for experiments, because plastics and their additives act differently depending on physical and chemical contexts, and because their characteristics may change as creatures along the food chain consume, metabolize, or excrete them. We know virtually nothing about how food processing or cooking affects the toxicity of plastics in aquatic organisms or what level of contamination might hurt us...

[b. In the Body:] ...Marine plastics... eventually will degrade and fragment into nanoplastics, which measure less than 100 billionths of a meter—in other words, they are invisible. Alarmingly these tiny plastics can penetrate cells and move into tissues and organs. But because researchers lack analytical methods to identify nanoplastics in food, they don't have any data on their occurrence or absorption by humans." [30]

Johnson and Norris explain "...The lightweight nature of plastics means that they are easily dispersed throughout the environment via wind or water, and can fragment, float or become suspended in water. And since plastics are based on organic molecules, they attract other organic molecules when present, including persistent organic pollutants (POPs) like DDT, PCBs or hydrocarbons. In fact, numerous studies document the accumulation of POPs in the fatty tissues of higher order fish and marine mammals (see articles in Environmental Pollution and Journal of Environmental Monitoring)." [17]

III. **Chemical Concerns—Plastic Chemistry Varies Widely:** Royte explains, "Plastic isn't one thing. It comes in many forms and contains a wide range of additives—pigments, ultraviolet stabilizers, water repellents, flame retardants, stiffeners such as bisphenol A (BPA), and softeners called phthalates—that can leach into their surroundings.

Some of these chemicals are considered endocrine disruptors—chemicals that interfere with normal hormone function, even contributing to weight gain. Flame retardants may interfere with brain development in fetuses and children; other compounds that cling to plastics can cause cancer or birth defects. A basic tenet of toxicology holds that the dose makes the poison, but many of these chemicals—BPA and its close relatives, for example—appear to impair lab animals at levels some governments consider safe for humans." [30]

"Most plastic utensils are made of polystyrene, which can release toxic chemicals when heated." [29]

IV. **PFAS:** Manufacturers add PFAS to some paper and fiber products, including single-use food service products. The Collaborative Network for a Cancer-Free Economy explains, "PFAS constitute a class of over 3,000 fluorinated chemicals that persist in the environment for a very long time. The most studied chemicals in the class, PFOA and PFOS, have been associated with cancer, developmental toxicity, immunotoxicity, and other health effects." [35] [36]

By January 2020, BPI certified compostable products will not contain intentionally added fluorinated chemicals and will be tested to ensure they do not contain too much unintentionally added fluorinated chemicals (e.g. from a previous manufacturing stage). [37]

V. **Battery Hazards:** Battery technology has advanced rapidly producing smaller, more powerful, and longer lasting batteries than before. Batteries in single-use items contain metals that can be recycled. Some of these are heavy metals, such as nickel, cadmium, lithium, or mercury, which can get into the environment and harm human health if not managed properly. Lithium and lithium-ion batteries can explode or cause fires if damaged. Often product design makes it challenging or impossible to get batteries out of these items safely by the user without damaging the batteries. Currently, there is no requirement to label these single-use items, so many consumers do not know that the product contains a battery.

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Table 11. Aggregate Composition of MSW Disposed[13][14]

Material	Estimated Percent	+/-	Estimated Tons	Material	Estimated Percent	+/-	Estimated Tons
Paper	19.9%	1.6%	83,880	Organics	24.4%	1.9%	103,127
Newsprint	0.9%	0.3%	3,759	Food Waste - Contained in Packaging	7.3%	1.0%	30,653
High Grade Office Paper	0.4%	0.2%	1,579	Food Waste - Loose	12.1%	1.5%	50,974
OCC (Old Corrugated Cardboard)	3.9%	0.8%	16,319	Leaves/Grass/Brush >1"	0.1%	0.4%	300
Magazines/Catalogs	0.8%	0.3%	3,201	Leaves/Grass/Brush <1"	0.7%	0.8%	3,082
Mixed Recyclable Paper	1.5%	0.6%	6,528	Pet Waste	2.9%	0.7%	12,089
Boxboard (chipboard)	1.1%	0.2%	4,537	Other Organics	1.4%	0.6%	6,028
Books	0.3%	0.2%	1,272				
Polycoated / Aseptic Containers	0.3%	0.1%	1,162	Metal	2.5%	0.4%	10,692
Compostable Paper	8.4%	0.7%	35,403	Aluminum Beverage Cans	0.3%	0.1%	1,200
Non-Recyclable Paper	2.4%	0.9%	10,121	Aluminum Foil, Pans & Food Cans	0.3%	0.1%	1,332
				Ferrous Containers	0.6%	0.2%	2,582
Plastic	12.7%	1.5%	53,712	Other Ferrous	0.9%	0.3%	3,790
#1 PET Bottles	0.6%	0.1%	2,424	Other Non-Ferrous	0.4%	0.2%	1,788
#1 PET Food and Dairy Bottles and Jars	0.2%	0.0%	788				
#2 HDPE Bottles	0.1%	0.1%	618	Electronics	0.7%	0.6%	2,965
#2 HDPE Food and Dairy	0.3%	0.1%	1,182	CED CRT's	0.1%	1.0%	579
#3 - #7 Bottles	0.1%	0.1%	431	CED Televisions & Monitors, non-CRT	0.2%	1.9%	972
Plastic Cups, Tubs and Lids	0.9%	0.1%	3,840	CED Desktop & Laptop Computers	0.0%	0.1%	57
Bulky Rigid Plastics > 1 Gallon	1.5%	1.2%	6,487	CED Computer Peripherals/Printers	0.0%	0.0%	23
Plastic Thermoforms	0.3%	0.0%	1,308	Banned, Non-CED electronics	0.1%	0.1%	438
Plastic Film Pouches	0.0%	0.0%	178	Small Appliances	0.2%	0.3%	896
Film - Retail Bags	0.5%	0.1%	2,168				
Film - ICI Wrap	1.5%	1.4%	6,270	C&D	11.1%	2.0%	46,823
Film - Garbage Bags	1.7%	0.2%	7,270	Drywall/Gypsum Board	0.4%	0.7%	1,674
Film - Other	2.2%	0.2%	9,375	C & D Metal	0.2%	0.8%	895
Other Plastic	2.7%	1.0%	11,374	Asphalt Shingles	0.5%	1.2%	1,985
				Plywood	0.5%	0.7%	2,079
Glass	1.9%	0.4%	8,102	Oriented Strand Board	0.0%	0.1%	46
Glass Beverage Bottles	1.0%	0.3%	4,197	Asphalt, Brick and Concrete	0.0%	0.0%	140
Food and Dairy Glass	0.4%	0.1%	1,545	Wood - Painted and Treated	3.4%	0.8%	14,393
Plate Glass	0.1%	0.6%	545	Wood - Clean	3.1%	1.4%	13,255
Other Glass	0.4%	0.2%	1,815	Other C & D	2.9%	1.1%	12,357
Special/Other Textiles	26.3%	2.0%	111,214	Hazardous Waste	0.4%	0.2%	1,742
and Leather Rubber	4.2%	1.0%	17,830	Paint	0.1%	0.5%	389
Carpet and Carpet Padding	0.6%	0.2%	2,594	Batteries (Primary)	0.1%	0.0%	246
Diapers/Sanitary Products	3.1%	2.1%	12,918	Batteries (Rechargeable)	0.0%	0.0%	6
Furniture/Bulky Items	3.6%	0.9%	15,403	Mercury Thermostats/Thermometers	0.0%	0.0%	0
Tires	9.1%	2.2%	38,298	Mercury Lamps	0.0%	0.0%	21
Fines/Dirt/Mixed Residue	0.2%	2.4%	986	Mercury - Other	0.1%	0.9%	225
All Other Wastes Not Elsewhere Categorized	1.5%	0.4%	6,494	Other HHW	0.2%	0.1%	855
	4.0%	0.5%	16,691	Grand Total	100%		422,258
				Sample Count	181		

Estimated ½ single-use → Bulky Rigid Plastics > 1 Gallon

Estimated 30% single-use → Other Plastic

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

[13] Bulky wastes (29,924 tons) were added to the Furniture/Bulky Items subcategory and Other Wastes (10,973 tons) were added to Special/Other subcategory to better characterize waste disposal in Vermont. However not all bulky waste is furniture, but in the absence of characterization waste, this was a logical category to use as a placeholder.

[14] Note that while primary batteries were included under Hazardous Waste, they are in fact not classified as hazardous waste.