



2017 Diversion and Disposal Report

A summary of solid waste management in the State of Vermont

Prepared by:

Waste Management & Prevention Division
Solid Waste Management Program

December 2018

Introduction

The Waste Management and Prevention Division's Solid Waste Management Program respectfully submits the Program's annual report describing how solid waste was managed in Vermont during the 2017 calendar year. This narrative report summarizes the sources of data used to determine the annual totals and briefly describes the significant changes and trends.

In recent years, two events have significantly changed Vermont's material management, the first of these was the Universal Recycling law which focuses on increasing the convenience and choices available for the proper management of recyclables and organics. The second was the 2014 adoption of the statewide Material Management Plan (MMP) which establishes performance measures for the Agency and partners. Some of the changes implemented by these efforts include landfill bans on recyclables in July 2015 and leaf and yard debris and clean wood in July 2016 and mandatory collection of organics at solid waste facilities in 2017, the solid waste management systems have adjusted accordingly, and this is reflected by recent changes to the tonnages and types of solid waste managed within Vermont.

The data and information presented within this summary are primarily based on reports that permitted solid waste facilities across the State are required to submit annually. All permitted solid waste facilities (including landfills, transfer stations, material recovery facilities and organics management facilities) are required to provide the Program with detailed information on the flow of solid waste under their management. As such, the data presented in this report is only as reliable as the data submitted. Though there is some quality control maintained over the submitted data, it remains likely that there are inaccuracies in the reporting. On a statewide basis, it is believed that these inaccuracies only have a minor influence on the data compilation. It is also necessary to utilize estimates, derived from existing comprehensive waste composition studies to complete our assessment of comprehensive solid waste management. When an estimate from another source is used within the report it is notated and cited.

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References

- 2013, DSM Environmental Services, Inc., Tellus Institute and RLS. System Analysis of the Impact of Act 148 on Solid Waste Management in Vermont: Final Report. Prepared for Vermont Department of Environmental Conservation, Solid Waste Management Program.
- 2002, DSM Environmental Services, Inc. Vermont's Municipal Solid Waste Diversion Rate: 2001; Results of Recycling and Reuse Survey. Final Report. Prepared for Vermont Department of Environmental Conservation, Solid Waste Management Program.

Executive Summary

In 2017 Vermonters generated 630,851 tons of municipal solid waste (MSW). This is a increase of 7.7% over the 585,789 tons generated in 2016. Of the solid waste generated, the Vermont materials management system diverted of 213,449 tons of material and the disposed of 417,402 tons. The resultant 34% diversion rate is comparable the 31% average diversion rate of the last 10 years. State-wide goals are to reduce the disposal of municipal solid waste to 2.76 pounds per person, and to increase diversion rates to 50% by 2022 (approximately 2 years after the comprehensive food scrap landfill ban goes into effect per the Universal Recycling Law).

Approach: Tracking the Flow of Vermont's Solid Waste

Within Vermont, public and private solid waste facilities are required to submit annual or quarterly reports to the Solid Waste Management Program ('Program') on the types, amounts and management of solid waste materials handled by their facility. Facilities include, but are not limited to, transfer stations, material recovery facilities, compost facilities, landfills, and recycling centers. In some cases, estimates from previous detailed analysis of the Vermont's material management system are also used. These alternative data sources are noted throughout the report when they are used. It is likely that this approach to tracking the flow of solid waste throughout the state underrepresents the total amount of solid waste managed within the state. This is particularly true for non-residential waste. Often significant quantities of commercial and industrial waste do not pass through a permitted Vermont facility, as they may be backhauled or directly transferred to a market. The estimates used to represent this 'Direct to Broker' or economic recycling of materials is becoming dated and likely underrepresent the quantities managed. The Program has contracted with DSM Environmental Services, Inc. in 2018 for the completion of analysis to update these values.

The Program believes the data for the final management of the State's discarded materials are the most reliable of all the data. With only two landfills operating within the state and a limited number of transfer stations and material recovery facilities that sell directly to markets or reuse materials, the end-use management data aggregated by these types of facilities has the highest likelihood of being consistently and reliably tracked and reproduced from year to year. The ability to document the source and generation of solid waste is a much more challenging task. With a wider variety of types of facilities and collection points within Vermont, generation data is often incomplete and inaccurate. The Program recognizes that this is an area that can be improved; however, it is unlikely that generation data will be as reliable as the disposal and diversion data within the near future. For this reason, the generation value in this report is calculated based on the summation of the tonnages reported from the final management activities that occur at the statewide scale. In its most simplistic format:

$$\text{Disposal (tons) + Diversion (tons) = Generation (tons)}$$

I. Disposal Activities

Disposal at Vermont Facilities — In 2017 there were two permitted and operating solid waste landfills within Vermont (Table 1). Together these landfills accepted 75% of the disposed municipal solid waste generated within Vermont (Table 2). The remaining 25% of Vermont’s disposed municipal solid waste was transported, either directly from the source or from a facility, to an out-of-state (OOS) facility (Figure 1, Table 3).

Table 1. Status of Vermont landfills that were permitted for waste acceptance in 2017

Solid Waste Landfills	Location	Status	Permitted Fill Rate (tons/year)
New England Waste Services, Vermont (NEWSVT): Phase IV: Cells 1-4	Coventry	Operating	600,000
Salisbury Landfill	Salisbury	Operating, unlined	1,000
Northwest Solid Waste District – Sheldon: Cell 1	Sheldon	Permitted, no current plans for construction, not operating	20,000

Table 2. In-state and Out-of-State (OOS) materials disposed *within* Vermont landfills, as reported in 2017

	Total Tons (as reported by disposal facilities)	OOS Tons	VT Tons (Total tons minus OOS tons)
MSW	359,426	---	359,426
C&D	7,765	7,755	10
Sludge (WWTP)	28,297	15,228	13,069
Asbestos	36,759	35,152	1,607
Ash	1,031	1,031	---
Contaminated Soil	51,427	50,945	482
Sewer Grit	959	43	916
Paper Sludge	1,741	---	1,741
Medical Waste	97	---	97
Other	6,214	2,598	3,615
TOTAL	493,716	112,753	380,963

Disposal Occurring Out-of-State — Information about Vermont waste that is disposed out-of-state (OOS) is derived from two sources. Facilities report the quantity of materials that they have sent OOS for final management; however, this does not capture materials that are hauled directly OOS without passing through a reporting Vermont facility. For this reason, an annual independent audit collects data from OOS facilities and from haulers that are known to manage Vermont solid waste. The auditor reports these values annually to the Program and this information is combined with the Vermont facility reports to derive the OOS transport tonnage.

Table 3. Solid waste sourced in Vermont but sent for management at an Out-of-State facility in 2017

	Massachusetts	New Hampshire	New York	Quebec	Total
MSW	331	37,609	81,580		119,520
C&D		13,120	3,091	5,644	21,855

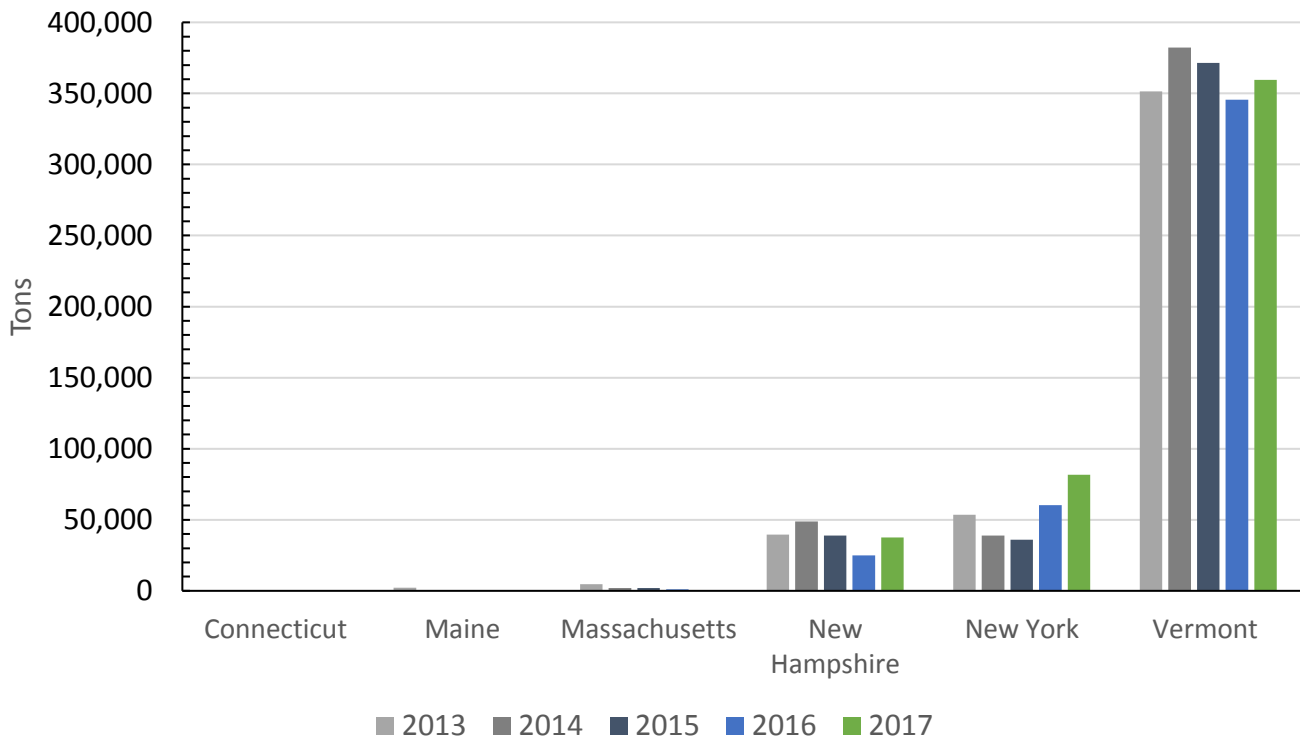


Figure 1: Destination of disposed MSW that was generated in Vermont in 2017, with recent years for comparison

Beneficial Use in Vermont Landfills — In addition to the disposal of materials within Vermont’s landfills, there are several material types that can be used for landfill operations (Table 4). These materials are used in place of virgin materials for daily cover and operations, and although their ultimate end use is within the airspace of the landfill, they are classified as beneficial use. Materials that are used beneficially in the landfill are not included in MSW disposal or diversion tonnages.

Table 4. Beneficial use of solid waste materials within Vermont landfill operations in 2017

Material	Use	Tonnage
Paper Sludge	Landfill Alternative Daily Cover	148
Contaminated Soils	Landfill Alternative Daily Cover	40,530
Sludge – cut with soil	Landfill Alternative Daily Cover	7,901
Processed C&D	Landfill Road Base	1,825
Sawdust	Landfill Road Base	1,977
Total		52,381

Adjusting MSW for Construction & Demolition Debris –Some Construction and Demolition (C&D) materials are tracked separately from MSW, and are reported as being sent for disposal, beneficial use, or diversion. However, loads of disposal materials are often co-mingled at transfer facilities and reported solely as MSW, though the load may contain C&D. It is often difficult to separate these materials from the municipal solid waste (MSW) stream given the current materials management systems in the state.

For this reason, the results of a 2013 waste composition study prepared for the State of Vermont by DSM Environmental are used to estimate the C&D and MSW percentages of all materials reported as disposed. Manual and visual separation of MSW materials during the waste composition study indicated that 10.2% of residential MSW consisted of C&D waste, and made up 15.5% of the sorted Industrial, Commercial and Institutional (ICI) MSW (2013, DSM Environmental). As residential and ICI waste tonnages are not differentiated within the values reported by facilities, an average of 12.85% was utilized to estimate the amount of reported tonnages that was likely MSW and/or C&D waste (Table 5).

Table 5. Adjustment of MSW tonnage for estimated C&D component

	Reported Tonnages	C&D tonnage (12.85% of reported MSW)	Remaining MSW Tonnage
Vermont MSW In-state Disposal	359,426	46,186	313,240
Vermont MSW Out-of-State Disposal	119,520	15,358	104,162
Total Vermont MSW Disposal	478,946	61,544	417,402

II. Diversion Activities

Materials are diverted from the landfill through a variety of pathways in Vermont. While the Solid Waste Management Program has reliable reporting systems in place for some components of these diversion pathways, others are not directly reported and require approximation. Broadly, there are four principal avenues of material diversion which are accounted for by this report (Table 6):

Group A – From a Reporting Facility to a Market

As with the disposal data, most of the state's diversion data comes from facilities that self-report the flow of diverted materials. Within Vermont there are four material recovery facilities (MRF's) that manage the majority of diverted recyclable materials. These facilities collect, sort, and process materials for distribution to recycling markets. As permitted solid waste facilities, they report quarterly to the Solid Waste Program. Additionally, some materials that are collected by transfer stations and recycling centers do not require further separation and can be sold directly by the collection facility to market. One hundred twenty-one collection facilities reported selling some type of material directly to a market.

In 2017 there were thirteen compost facilities within the State that were certified to process food scraps and/or leaf and yard debris.

Construction and demolition (C&D) materials are also tracked in Group A. Historically, C&D materials have been excluded from the materials tracked in the diversion tonnages. These materials are difficult to track due to the significant reuse of materials occurring outside of the Solid Waste system. However, in late 2013 the State's first dedicated C&D recycling facility opened, and several other solid waste facilities have since adopted more active separation programs to collect and market the valuable C&D materials. In July of 2014, the Vermont Legislature passed Act 175 which mandated the recycling of architectural waste, a subset of construction and demolition waste (i.e. scrap metal, asphalt shingles, clean wood, drywall, plywood, and oriented strand-board).

Group B – Estimate of Direct to Broker or Market (Economic Recycling)

In some cases, the recovery of materials occurs directly between business entities and brokers, thereby bypassing a reporting Vermont solid waste facility. For example, a supermarket may sell and ship large quantities of cardboard directly to a broker, instead of hiring a hauler, because it makes economic sense for a business of this scale to sell its recyclables directly. In a 2001 Vermont Diversion Rate study (2002, DSM Environmental), a survey of Vermont employers and manufacturing facilities identified and estimated the amount of recyclable materials that were either backhauled or sold directly to a broker by the business sector. On the basis of an extrapolated survey, this study estimated the tonnage of fibers, containers and scrap metal delivered directly to a broker or market in 2001. Because "economic recycling" was shown to be a significant contributor to the diversion of materials, these estimates have been included in the annual Vermont Diversion and Disposal Report since the completion of this study. As packaging and economic recycling trends have changed since 2001, these estimates are certainly of limited accuracy and should be updated in the future. The other category of material types sent directly to a broker without passing through a Vermont solid waste facility is the estimated 17,480 tons of beverage containers collected and processed through the Vermont Bottle Bill for distribution to market (Table 40; 2013, DSM Environmental). As Vermont redemption centers are not considered solid waste facilities, they are not required to report annual tonnages on this important diversion activity.

Group C – Reported Reuse Activities

There are numerous reuse, resale and repair businesses throughout Vermont; however, the diversity of material reused across the State makes estimates of this activity difficult, highly variable and inaccurate. For that reason, this report is limited to listing reuse totals derived from facility reporting. In other words, only materials collected at permitted solid

waste facilities for the purpose of local reuse are captured. As an example, the majority of the reuse tonnage reported here is listed under containers and represents ground glass which is utilized in local projects, often as road base material. Reported reuse does not capture the vast amount of materials that are taken from the point of generation (residences, businesses, etc.) directly to a reuse or salvage store, or re-purposed at the point of generation.

Group D – *Estimated Household Composting*

A 2001 study on Vermont’s Municipal Solid Waste Diversion Rate outlined an approach for estimating rates of backyard composting for both yard waste and food scraps (2002, DSM Environmental). This estimate is based on a Vermont survey which identified that 39% of Chittenden county households were composting yard wastes, while 29% composted food scraps. With estimates of 250 pounds of yard waste and 350 pounds of food scraps composted per household per year, and an estimated 335,224 Vermont households in 2017, the resultant home composting estimates for 2017 are: 16,342 tons of yard waste and 17,013 tons of food scraps. This 33,355 tons of organics managed in 2017 by home composting is likely an underestimate as rates of home composting have likely increased since 2001. With the advent of Universal Recycling within the State, home composting is likely to continue increasing as a diversion tool, and more work is required to refine these numbers and provide better estimates for the 2018 Diversion and Disposal Report.

Table 6. Summary of Vermont’s 2017 diversion activities

(in tons)	Fibers	Containers	Single Stream	C&D	Scrap Metal	Organics	Foodbank Food Rescue	Miscellaneous
A- From Reporting Facility to Market	70,953	11,678	1,044	12,036	9,320	12,613		98
B- Estimate of Direct to Broker or Market (Economic Recycling)	33,495 [†]	17,480* 117 [†]			251 [†]			
C- Reported Reuse Activities	176	6,240		4			4,320 [‡]	269
D – Estimated Household Composting						33,355 [†]		
TOTALS	104,624	35,515	1,044	12,040	9,571	45,968	4,320	367
	A + B + C + D = 213,449							

*Denotes an estimate derived from the System Analysis of the Impact of Act 148 on Solid Waste management in Vermont (2013, DSM Environmental Services, Inc.).

[†]Denotes an estimate derived from the Vermont’s Municipal Solid Waste Diversion Rate 2001 study (2002, DSM Environmental). See above descriptions of the diversion groups for details.

[‡]Denotes tonnages that have been provided by the Vermont Foodbank.

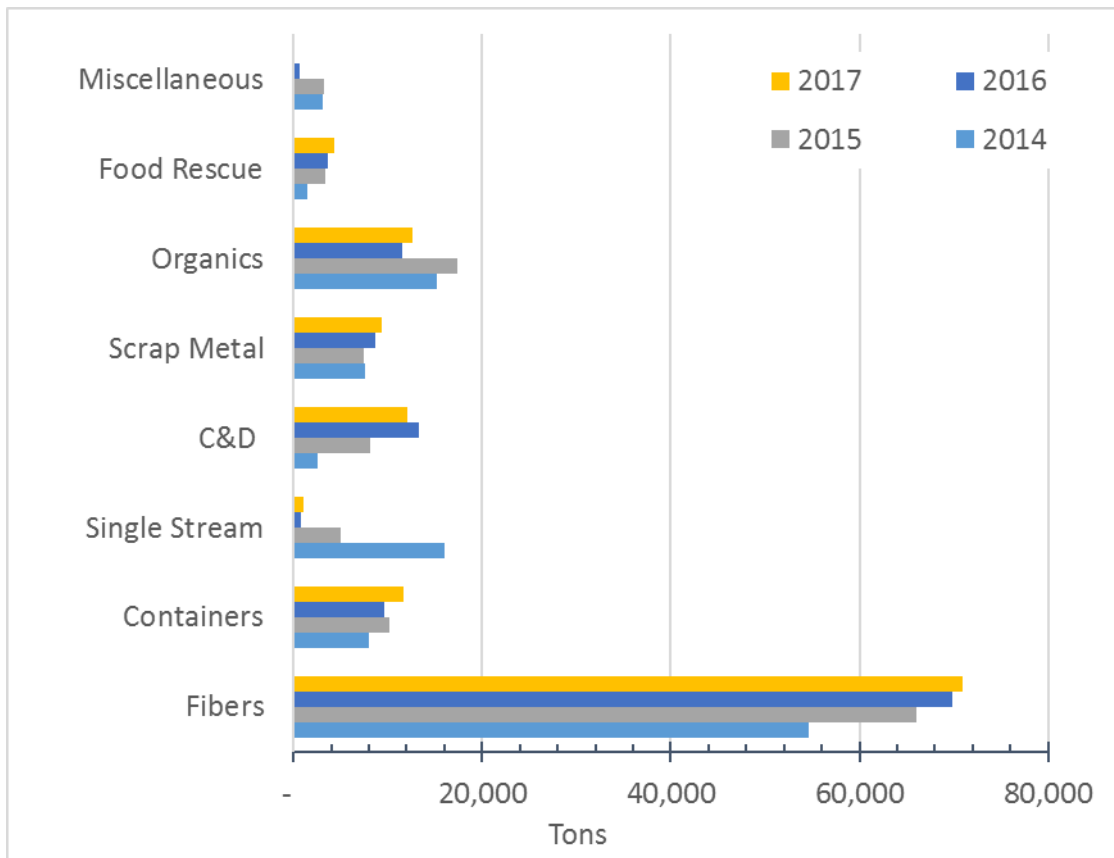


Figure 2: 2014-2017 comparison of materials marketed directly from Vermont solid waste facilities (Group A from Table 6).

Figure 2 displays the composition of recyclable materials sold to market year-to-year. Comparing diversion tonnages by material type helps the Program consider the impacts of market conditions on recycling activity in Vermont. Overall, the total tonnage of diverted material increased from 2016 to 2017. Diverted C&D has maintained consistent diverted tonnages, largely due to the implementation of Act 175 in 2015 and the increased attention to separating and marketing these materials. It is important to look past the overall net decrease of tons of recycled materials to observe the effect of fluctuating markets on the relative amount of material types recycled in any given year. It is also important to remember that the total tonnage of diverted materials changes each year as generation fluctuates. When considering the progress of recycling efforts in Vermont, the percent of materials diverted is a better metric than the total tonnage.

III. Total Municipal Solid Waste Generation and Summary

On the basis of the previously stated formula:

$$\text{Disposal} + \text{Diversion} = \text{Generation}$$

Vermont generated **630,851 tons** of municipal solid waste materials in 2017. Total MSW disposal (adjusted to remove C&D component) was 417,402 tons, a sizable increase from 2016, while diversion increased to 213,449 tons.

While this figure is an under-representation of the complete material management tonnages for the state, it does represent the components that the Solid Waste Program can accurately and consistently track year to year for meaningful comparisons.

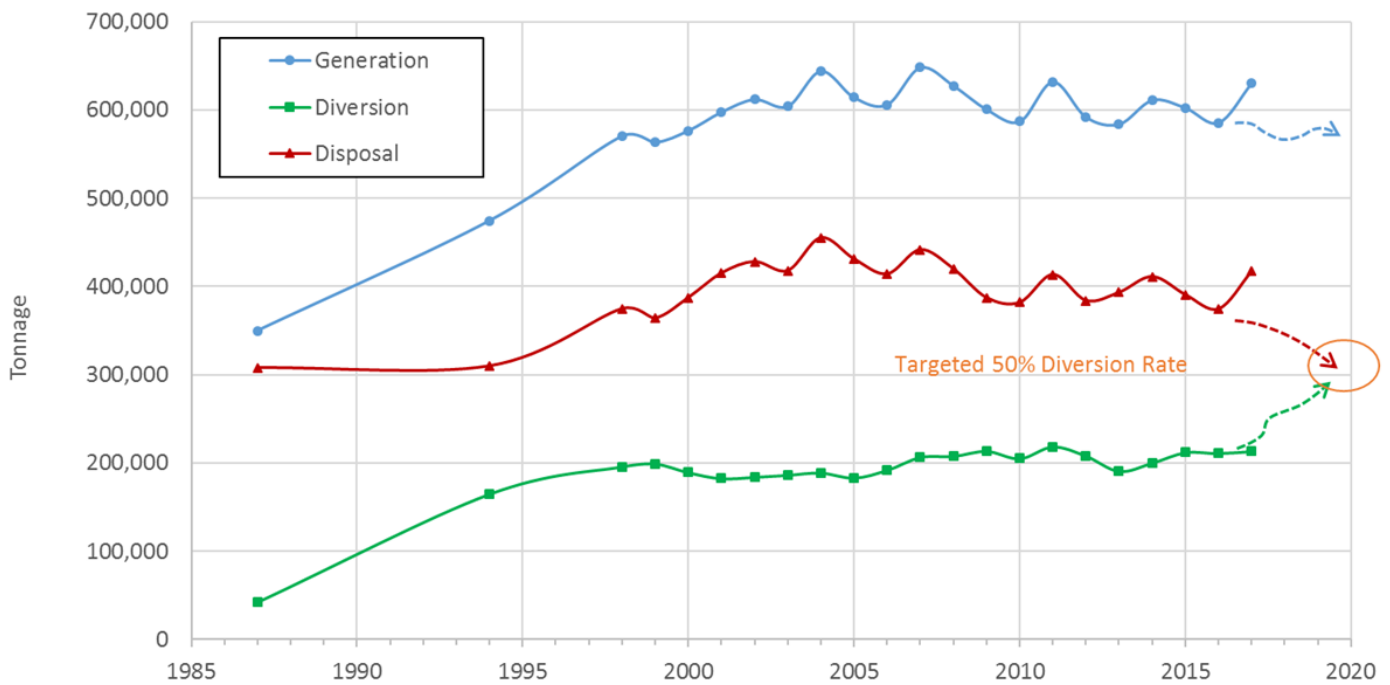


Figure 3: Projections of waste generation, diversion, and disposal with the implementation of Universal Recycling over coming years

Table 7. Vermont generation, diversion and disposal totals for municipal solid waste. Includes tonnages, per capita breakdowns and percentage rates.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Generation	577,449	569,612	609,497	579,689	571,446	613,517	592,981	566,042	552,297	597,254	557,302	584,235	611,472	602,617	585,789	630,851
Diversion	149,319	151,577	154,217	148,459	157,173	171,818	173,024	178,796	170,326	183,737	173,258	190,797	200,272	212,065	211,152	213,449
Disposal	428,130	418,035	455,281	431,230	414,273	441,699	419,957	387,246	381,971	413,517	384,044	393,438	411,200	390,552	374,637	417,402
Population [1]	615,250	617,101	618,794	619,736	620,778	621,254	621,270	621,750	625,741	626,592	625,953	626,630	626,562	626,042	624,594	623,657
Per Capita MSW Generation (Tons/Year)	0.94	0.92	0.98	0.94	0.92	0.99	0.95	0.91	0.88	0.95	0.89	0.93	1.0	0.96	0.94	1.01
(Pounds/Day)	5.14	5.06	5.40	5.13	5.04	5.41	5.23	4.99	4.84	5.22	4.88	5.11	5.35	5.27	5.14	5.54
Per Capita MSW Diversion (Tons/Year)	0.24	0.25	0.25	0.24	0.25	0.28	0.28	0.29	0.27	0.29	0.28	0.30	0.32	0.34	0.34	0.34
(Pounds/Day)	1.33	1.35	1.37	1.31	1.39	1.52	1.53	1.58	1.49	1.61	1.52	1.67	1.75	1.86	1.85	1.88
Per Capita MSW Disposal (Tons/Year)	0.70	0.68	0.74	0.70	0.67	0.71	0.68	0.62	0.61	0.66	0.61	0.63	0.66	0.62	0.60	0.67
(Pounds/Day)	3.81	3.71	4.03	3.81	3.66	3.90	3.70	3.41	3.34	3.62	3.36	3.44	3.60	3.41	3.29	3.67
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Generation	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Diversion	26%	27%	25%	26%	28%	28%	29%	32%	31%	31%	31%	33%	33%	35%	36%	34%
Disposal	74%	73%	75%	74%	72%	72%	71%	68%	69%	69%	69%	67%	67%	65%	64%	66%

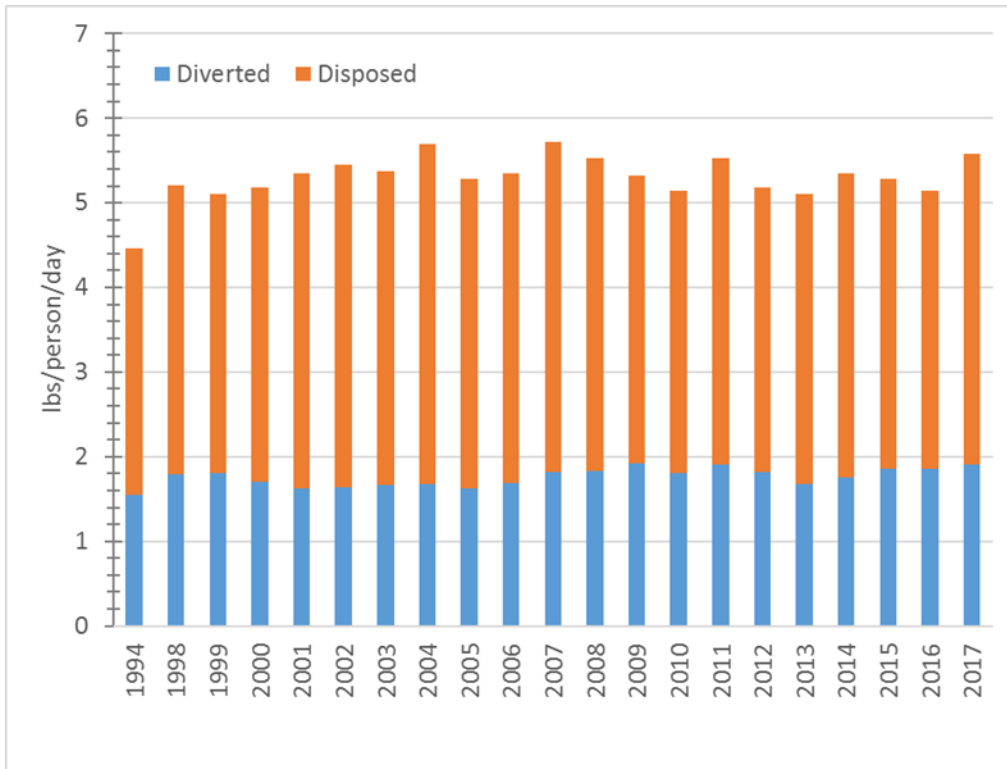


Figure 4: Pounds of waste generated per day per person (disposed + diverted) by Vermonters

IV. Other Material Management Activities – Not included in disposal or diversion tonnages

Hazardous Waste

Household hazardous waste (HHW) and conditionally exempt generator (CEG) hazardous waste is collected and managed at several fixed full-time facilities in the state and at numerous collection events, 115 in 2017, hosted by municipalities throughout the year. Information on the materials collected over the course of the year is reported through the ReTRAC™ online reporting system similar to the solid waste facility reporting, as described earlier. This data is summarized in an annual HHW Survey Results report (Appendix A). A total of 864 tons of combined HHW and CEG materials were collected in 2017, a decrease over the 1,069 tons collected in 2016; however, participation rates were at their highest to-date (Table 8). It is important to note that the values reported within the HHW Survey Results only reflect material collected at fixed HHW facilities and events. These numbers do not capture all the HHW that is collected through extended producer responsibility programs as reported upon below.

Table 8. Summary of historic hazardous waste collections and participation

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Total HHW and CEG tons	865	1,069	899	452	525	460	467	489	566	436	444
% participating VT households	10%	8%	6%	7%	7%	9%	7%	6%	8%	9%	7%
Pounds collected per household (avg.)	60	86	131	102	62	34	47	46	45	30	39

Mercury Programs

In 2007, Act 149 banned the knowing disposal of products containing mercury within Vermont landfills. Extended Producer Responsibility (EPR) programs for collection and recycling of mercury were established for thermostats in 2008 and for some mercury-containing lamps in 2012.

Mercury-containing thermostats are collected and reported on by the Thermostat Recycling Corporation to the State of Vermont. This program collected 17.3 pounds of mercury in 2017 from 2,468 thermostats.

Mercury-containing lamps that are covered by the EPR program are collected, recycled, and reported on by the National Electrical Manufacturers Association (NEMA). During 2017, NEMA collected and recycled 202,926 mercury-containing lamps and bulbs. 166.6 pounds of mercury have been collected since the start of this program and Vermont has attained the highest per capita collection rate in the country. Mercury-containing lamps that are not covered by the EPR program and lamps that are covered by the program and collected by municipalities are categorized as household hazardous waste in this report.

Vermont Electronic Recycling Program

The Vermont Electronic Recycling Program (E-cycles) was first implemented in July of 2011. This program provides no-cost electronic device recycling for covered entities and devices. During the 2017 collection period, 2,156 tons of e-waste were collected.

Batteries

In 2014, Vermont became the first state to require manufacturers to fund recycling of single-use batteries, with the passage of the Vermont Primary Battery Stewardship Law. The law requires producers of primary batteries (non-rechargeable batteries) sold in Vermont to register with Vermont Department of Environmental Conservation (DEC) and provide a stewardship plan to manage the proper recycling and/or disposal of primary batteries sold in Vermont. A Primary Battery is a non-rechargeable battery weighing two kilograms or less, including alkaline, carbon-zinc, and lithium metal batteries. Producers may choose to submit an individual stewardship plan or participate in a shared stewardship plan. Currently, most producers who sell in Vermont are under a shared stewardship plan which is implemented by the stewardship organization Call2Recycle.

Call2Recycle implements both the primary (non-rechargeable) battery stewardship program mandated by Vermont law and the manufacturer-led voluntary rechargeable battery collection program. This allows for both types of batteries to be collected at no cost to consumers in Vermont in convenient locations throughout the state. There are over 100 collection sites available in Vermont for battery recycling which offers 98% of Vermont residents and businesses access to a collection site within 10 miles of their home or business. The stewardship program is funded by battery producers who pay fees based upon their Vermont sales.

During the 2017 collection year, 133,619 pounds of batteries were collected under this program. The collection of primary batteries has increased by 2,300% since the program started and rechargeable batteries has also increase by 43%.

PaintCare

In May of 2013, Vermont Legislature passed paint product stewardship legislation (Act 58) that establishes free paint collection sites at retailers and permitted solid waste facilities across the State, funded by a small fee appended to paint sales in Vermont. This program is implemented by a stewardship organization called PaintCare, who worked with the Solid Waste Program in 2013 to develop the final Vermont Paint Stewardship Program Plan. The program officially launched on May 1, 2014. An annual report is due to the Program by October of each year, with a reporting period of July 1-June 30th. During this third collection period, July 1, 2016 to June 30, 2017, 96,109 gallons were collected. Although lower (11% decrease) than the previous program years collection, this continues to be a significant increase over the average annual collection of 60,000 gallons that occurred in years prior to implementation of the PaintCare program.

Appendix A: Household Hazardous Waste Report

SUMMARY OF 2017 VERMONT HHW/CEG WASTE PROGRAMS

All Solid Waste Districts and Alliances, in alphabetical order

HHW/CEG Material Collected (all materials in tons) [†]	All Solid Waste Districts and Alliances, in alphabetical order															
	Addison SWMD	Bennington County Solid Waste Alliance	Central Vermont SWMD	Chittenden SWD	Lamoille RSWMD	Londonberry Group	Mad River RMA	Mountain Alliance	Northeast Kingdom WMD	Northwest SWMD	Rutland County SWD (excludes SWAC)	Solid Waste Alliance	Southern W/W Counties	Windham SWD	White River Alliance	
1 Acids	0.43	0.42	0.42	2.39	0.42	0.13	0.27	0.35	0.34	0.19		0.03	0.32	0.73	0.20	
2 Aerosols	0.96	0.81	0.72	10.15	1.00	0.20	0.74	0.88	0.48	1.22	4.16	0.02	2.19	1.21	0.62	
3 Bases	0.82	0.76	0.55	3.76	0.48	0.10	0.12	0.23	0.27	0.27			0.48	0.50	0.20	
4 Fire Extinguishers		0.02		0.07						0.72						
5 Flammables & Solvents	10.27	3.53	2.49	41.86	2.71	1.00	7.00	2.55	6.45	1.49	3.68	0.50	7.71	4.35	0.07	
6 Glycols (Antifreeze)	2.78		0.40	8.55	0.83		3.00			3.16	0.44	0.58	2.70		0.51	
7 Oxidizers	0.36	0.62	0.04	1.16	0.10	0.01	0.06	0.02	0.14	0.01			0.48	0.48	0.34	
8 Lead Paint Chips & Debris	0.30		0.30							0.06						
9 Paints – Latex	1.80		111.89		3.10		1.85		12.99		4.93				7.26	
10 Paints – Oil	12.25		34.30				1.15		3.65	1.95	1.35				1.24	
11 Paints – Oil + Latex, Mixed				0.34		8.95		19.93		106.40		2.58	18.49			
12 Paints – Non-process Resins	4.91	2.43	3.47	17.23	2.27	2.00	0.60	1.60	4.43	3.10			1.85			
13 Pesticides	2.20	2.82	1.33	12.23	1.23	0.40	1.20	0.98	0.68	0.94		0.30	3.00	2.13	0.27	
14 Propane Tanks		0.53							0.27	0.27	7.47	0.27			2.13	
15 Reactives	0.03	0.38	0.02	0.63							1.78			0.02		
16 Toxics	0.30		0.51	0.01						0.11						
17 Photo Chemicals			0.58							0.18						
18 Waste Oil – Uncontaminated	9.26		1.08	19.15					9.98	1.60	1.63	1.99		5.28	1.70	
19 Waste Oil – Contaminated				0.18	0.82	0.00										
20 Waste Oil – Oily Debris	1.90		0.31	6.33	1.25	0.08			0.21	0.13				0.44		
21 Waste Oil – Oil Filters	5.37			1.13					1.13							
22 Oily Water	0.88		1.15	2.25	3.12					0.80						
23 Mercury – Fluorescent Tubes	6.52	0.01		18.68			0.18	0.07	3.49	0.18				2.44		
24 Mercury – Other Lamps	0.10	0.21					0.15		1.08	3.12				0.97		
25 Mercury – Added Products		0.14	0.16	0.49	0.02			0.01	0.04	0.03			0.02	0.04		
26 Mercury – Elemental																
27 Mercury – Compounds																
28 Primary Batteries	2.67	0.21		9.98			0.12		4.61	0.68	0.80	0.31			0.22	
29 Rechargeable Batteries	4.22			3.88			0.10			0.06	0.75					
30 Lead-Acid Batteries	9.90			5.21			0.20		7.17		5.74				1.56	
31 Other misc. products		0.55	1.78	18.32	0.18	0.15	0.09	0.09		0.49	0.33	1.56	0.01	1.14		
Demographics																
Occupied Households in Area ^{††}	13,354	14,552	22,117	61,827	10,906	1,478	5,891	4,792	19,593	19,824	19,953	5,786	19,296	15,958	3,971	
Program Profiles																
Number of Events Held	–	2	5	16	3	2	2	3	9	6	28	8	4	3	3	
# of households served	2489	410	282	9823	566	155	458	400	4382	1389	3151	321	587	215	147	
# of businesses served	111	3	7	656	14	2	33	1	2	45	84	4	5	10	–	
% household participation	18%	3%	1%	16%	5%	10%	8%	8%	22%	7%	16%	6%	3%	1%	4%	
Total HHW/CEG (tons)	76.2	13.4	13.9	330.9	14.2	8.0	22.8	9.6	60.7	35.5	135.1	11.8	21.3	38.2	16.3	
Total CEG Collected (tons)	7.99	0.44	1.54	125.67	2.61	0.36	4.16	0.2	1.46	0.13	1.98		0.05			
Total HHW Collected (tons)	70.2	13.0	12.4	205.3	11.6	7.6	18.6	9.4	59.2	35.3	133.1	11.8	21.3	38.2	16.3	
Avg. HHW/per household (tons)	0.028	0.032	0.044	0.021	0.021	0.049	0.041	0.023	0.014	0.025	0.042	0.037	0.036	0.178	0.111	
Avg. CEG/per business (tons)	0.072	–	–	0.192	–	–	–	–	0.730	0.003	–	–	–	–	–	

SEE VERMONT
TOTALS FOR EACH
MATERIAL
ON PAGE 2

[†] All reported materials are converted to tons using VT Solid Waste Program Combined HHW Conversion Factors. See cover page for details.

^{††} Household estimates were derived from the US Census Bureau: Population, Housing Units, Area and Density: 2010.

SUMMARY OF 2017 VERMONT HHW/CEG WASTE PROGRAMS

All Independent Towns, Shared HHW Events

HHW/CEG Material Collected (all materials in tons) [†]	VERMONT TOTALS							
	Canaan shared with Lemington	Coventry, shared with Barton, Lowell and Newport City	Fairfax	Salisbury	St. Johnsbury shared with Burke	Greater Upper Valley SWD shared with Hardford	Winhall	
1 Acids	4.08	0.07	0.07	0.12	0.08	0.36	0.02	11.4
2 Aerosols	1.09	0.15	0.13	0.40	0.30	0.85	0.05	28.1
3 Bases		0.04	0.14	0.08	0.13	0.35	0.01	9.3
4 Fire Extinguishers						0.02		0.8
5 Flammables & Solvents	11.44	2.40	0.40	0.68	1.77	1.84	0.17	114.4
6 Glycols (Antifreeze)					0.21	2.80		26.0
7 Oxidizers			0.02	0.08	0.08	0.14	0.34	4.4
8 Lead Paint Chips & Debris								0.7
9 Paints – Latex		2.00	1.90					147.7
10 Paints – Oil		0.90	0.38				0.30	57.5
11 Paints – Oil + Latex, Mixed				0.23	2.58	4.10		163.6
12 Paints – Non-process Resins		1.90	0.43		0.85			47.1
13 Pesticides	1.31	0.70	0.40	0.34	0.50	1.58	0.15	34.7
14 Propane Tanks							0.05	11.0
15 Reactives			0.00					2.8
16 Toxics								0.9
17 Photo Chemicals								0.8
18 Waste Oil – Uncontaminated								51.7
19 Waste Oil – Contaminated				0.34	0.41			1.8
20 Waste Oil – Oily Debris								10.7
21 Waste Oil – Oil Filters								7.6
22 Oily Water							0.20	8.4
23 Mercury – Fluorescent Tubes		0.10	0.13	0.07	0.05		0.03	32.0
24 Mercury – Other Lamps		0.02		0.01	0.10			5.8
25 Mercury – Added Products			0.01	0.04	0.00	0.08	0.00	1.1
26 Mercury – Elemental				0.04				0.0
27 Mercury – Compounds		0.00						0.0
28 Primary Batteries		0.00			0.03	0.05		19.7
29 Rechargeable Batteries		0.00	0.07	0.01	0.01		0.02	9.1
30 Lead-Acid Batteries		0.01						29.8
31 Other misc. products		0.04	0.01		0.05	1.32	0.01	26.1
Demographics								
Occupied Households in Area ^{††}	489	3,818	1,591	444	3,888	6,571	343	256,442
Program Profiles								
Number of Events Held	4	3	3	3	3	3	2	115
# of households served	28	219	385	44	282	311	40	25,844
# of businesses served	3	3	–	–	26	–	–	1,009
% households served	6%	6%	24%	10%	7%	5%	12%	10%
Total HHW/CEG (tons)	17.9	8.3	4.1	2.4	7.2	13.5	1.3	865
Total CEG Collected (tons)	0.91	0.3			1.02	0.35	0	149
Total HHW Collected (tons)	17.0	8.0	4.1	2.4	6.1	13.1	1.3	716
Avg. HHW/per household (tons)	0.608	0.037	0.011	0.055	0.023	0.042	0.034	0.03
Avg. CEG/per business (tons)	–	–	–	–	–	–	–	0.15

[†] All reported materials are converted to tons using VT Solid Waste Program Combined HHW Conversion Factors.

^{††} Household estimates were derived from the US Census Bureau: *Population, Housing Units, Area and Density: 2010*.

Appendix B: Vermont Biosolids Management Statistics for 2017

Table A-5: Vermont Biosolids Management Statistics for 2017

Management Option	In-State (wet tons)¹	Out-of-State (wet tons)¹	Total (wet tons)¹	Percent of Total	Percent Managed
Beneficial Uses:					
Land Application	4,459	0	4,459	5.4%	
EQ Biosolids	13,033	30,519	43,552	52.5%	
Subtotal	17,492	30,519	48,011		57.0%
Non-Beneficial Uses:					
Landfill	29,565	5,005	34,570	41.7%	
Incineration ²	0	298	298	0.4%	
Subtotal	29,565	9,464	34,868		41.1%
Total:	47,057	39,983	82,879	100%	100%
Total In & Out of State	56.8%	48.2%			

¹ All amounts of biosolids reported to DEC are converted from dry tons to wet tons assuming 15% solids (dry tons ÷ 0.15 = wet tons), which is generally the percent solids that can qualify to be landfilled.

² Note that nearly all biosolids sent to incinerators are in liquid form and the actual weight is greater than cited in this table. The table presents the approximate weight of the incinerated solids in wet tons. There are no incineration facilities located in Vermont.