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MEMORANDUM

TO: Board of Commissioners
FROM: Jon Dorwart
DATE: October 19, 2023
RE: 2022 Waste Diversion & Disposal Report

Attached is the 2022 Waste Diversion and Disposal Report. PowerPoint slides that summarize the report and will be presented at your October meeting will be forwarded ahead of the meeting. The report is produced annually to help track and evaluate how well our members are utilizing CSWD and private sector facilities, programs, and overall opportunities to reduce and divert their waste from the landfill; to fulfill State reporting requirements; and to provide information about the District's solid waste management system for communications to the general public, the media, and other communities and organizations.

2022 Waste Diversion & Disposal Report

Purpose & Overview of Report

The Chittenden Solid Waste District (CSWD) produces this annual waste diversion and disposal report to help track and evaluate how well District members are utilizing CSWD and private sector facilities, programs, and overall opportunities to reduce and divert their waste from the land-fill; to fulfill State reporting requirements; and to provide information about the District's solid waste management system for communications to the general public, the media, and other communities and organizations. It includes materials generated within Chittenden County only. It is produced for each calendar year.

The methodology and comparison of results to the previous year are found in the next two sections. The tons of CSWD waste disposed and diverted from disposal are displayed in the table on page 9. Notes on the lines in the table may be found on pages 10-11.

Methodology

Data Sources

Quantities of materials recycled, composted, and disposed are reported to CSWD by facilities that manage solid waste generated in Chittenden County and by businesses that ship their materials directly to other facilities that are not required to report to CSWD. Data received directly from the following facilities are included in this report:

- A. Marcelino & Co. (2011-2017)
- American Paper Recycling Corp. (2011-2011)
- BDS Waste Disposal, Inc.
- BED Waste Wood Yard
- Bob's Tire Co. (2016-2018)
- Budzyn Tire (beg. 2016)
- Burlington Area Transfer Station
- Canusa Hershman Recycling Co.
- Casella C&D Recycling Facility (2016-2018)
- Casella Transfer Station
- CSWD facilities
- FBS Tire Recycling, Inc. (2016-2018)
- Frank W. Whitcomb Construction Corp. (beg. 2015)
- Gauthier Trucking Co.
- Good Point Recycling
- Goodwill Industries
- Intervale Compost Products (2011)
- Iron Mountain (beg. 2019)
- LaPlatte River Angus (2011-11)
- Moretown Landfill (2011-13)
- Myers C&D Recycling Facility (beg. 2013)
- Pike Industries, Inc.
- Ranger Asphalt & Concrete Processing
- Salvation Army (2011-2016)
- SecurShred
- Shred-Ex
- Sleep Well Recycling (beg. 2020)
- Vermont Food Bank (beg. 2020)
- Waste USA Landfill

It was discovered in 2019 that many of the construction and demolition debris (C&D) loads that were delivered to one of the disposal facilities during 2015-2018 were miscoded as municipal solid waste (MSW). CSWD staff believe that most, but not all, of the errors have been corrected. The total tons of MSW landfilled or incinerated is likely lower than was reported and the total tons of C&D landfilled or incinerated is likely higher than was reported for calendar years 2015-2018. The uncorrected errors affect the accuracy of the diversion and disposal statistics used in this report for those years.

Beginning January 1, 2016, businesses that ship materials directly to brokers or markets for composting, recycling, animal feed, etc., were required to begin reporting quantities diverted to CSWD. Not all the data is being captured yet, but the total far exceeds what had been estimated for calendar years 2011-2015 based on research conducted by DSM Environmental Services for CSWD in 2007. The business data that is reported are included in the Diversion Table on page 9 by material.

The report includes only very limited data for salvage warehouse and other durable goods diversion through reuse and for extended producer responsibility program materials (e.g., fluorescent bulbs, thermostats, batteries, and paint) collected from the public by retailers. The report does not include data for commercial and institutional on-site composting.

Residue rates for recycling end markets are unknown. No adjustments for material losses have been made to tons reported recycled.

In keeping with the State of Vermont and the U.S. Environmental Protection Agency MSW diversion calculations, this report does not include regulated hazardous waste and unregulated hazardous waste disposed at out-of-state hazardous waste facilities.

Population Estimates

Population estimates needed to calculate figures come from the U.S. Census (www.census.gov). The seasonal population is calculated following the instructions provided by the Vermont Department of Environmental Conservation Solid Waste Program in the document titled, "Disposal Data for SWIP Reports."

Adjustments for Non-District Solid Waste

Based on a 2015 survey, an estimated 4.1% of CSWD Drop-Off Center (DOC) users are non-District residents. The quantities of materials brought to CSWD facilities by these customers increase the total amount of solid waste diverted and the total amount disposed. Beginning in 2015, the estimated non-District portions of MSW and C&D landfilled and mandatory recyclables diverted from disposal were subtracted from the corresponding categories. No adjustments were made for special materials non-District users may or may not have delivered to CSWD DOCs.

Also beginning in 2015, the percentage of incoming materials at the MRF from non-District sources was applied to outbound contamination disposed as MSW. This quantity was subtracted from Total MSW Landfilled/Incinerated. Similarly, the percentage of incoming materials at Myers C&D Recycling Facility from non-District sources was applied to outbound material disposed as C&D and subtracted from Total C&D Landfilled/Incinerated.

Comparison of Results to Previous Year

NOTE: This report uses the US Census 2022 population estimate for Chittenden County in relevant calculations (e.g., pounds per capita disposed). The US Census adjusts population estimates over time. Relevant calculations for these years will be amended as this data becomes available and will appear in future reports.

Summary

With the major impacts of the coronavirus pandemic (COVID-19) receding, solid waste disposal and diversion continues to follow the general trend of the last several years. Overall, compared to 2021, total generation of solid waste was down 0.1%. The tons of MSW disposed decreased by around 2.5%, with MSW tons diverted increasing by 2.6% to the highest level on record beating last year's high by over 2,600 tons. C&D tons disposed increased to its highest level in the last ten years. C&D tons diverted remained slightly lower compared to prior years but are up 2.1% over 2021. The amount of material used for Alternative Daily Landfill Cover (ADC) increased by 34.8%. The MSW diversion rate remained high at 55%, following a long-term trend of steady growth. The C&D diversion rate decreased slightly year-over-year; however the MSW and C&D combined diversion increased to 61.3 % this year putting the district in-line with historic highs. The estimated recovery rate for MSW mandatory recyclables decreased very slightly while the recovery rate for all currently divertible MSW materials increased by 1.2%.

Municipal Solid Waste

The amount of MSW landfilled decreased by 2.5%, lowering the pounds per capita per day disposed from 2.74 to 2.67. This decrease, despite a return to normalcy post-pandemic and enhanced economic activity during this period, supports the notion that diversion policies are working. Overall generation of MSW has increased rather sharply since the pandemic, comparable to totals experienced just prior in 2019. However, over the last ten years the increment diverted increased at an annualized rate of 4.0% versus a 0.6% decline of MSW that is disposed or incinerated. Notably, organics, which now makes up roughly 46% of total material diverted from MSW has grown 6.7% annually over the last decade. This annualized rate of growth in diverted organics accelerated after the implementation of Act 148 in 2014 signaling the effectiveness of this statute in changing residential and business behavior. These successes have occurred alongside slow but steady population growth, healthy economic growth, and in spite of the interruption of the pandemic.

The total of MSW materials diverted was up 2.6% from last year. There were significant increases in the tonnages of glass, clean wood, and food residuals diverted. The amount of electronics diverted declined. Scrap metal diversion increased dramatically, and unregulated hazardous waste remains below its ten-year average. Tires diverted declined about 16 percent from 2021 dropping below the ten-year average. The diversion of textiles corrected to levels seen prior to the pandemic which was likely caused by a spike in donations.

Quantities of clean wood have varied tremendously over the years, often due to the practice of recording quantities when wood is chipped and then transferred to the McNeil Generating Station inventory from the Wood Depot in Burlington. In 2021, McNeil received and added approximately 5,537 tons of wood to their inventory which is about 74.3 percent of all clean wood

waste. Notably, clean wood collected by CSWD facilities is now chipped and transferred to the Organics Recovery Facility and used for feedstock in their compost products, accounting for another 25.7%, or 1,916 tons, of the annual total as compared to 1,646 tons in 2021.

The increase in food residual quantities diverted benefits from a dramatic increase in reported tonnage of spent grains from breweries - up by 2,000 tons, or 30%, from 2021 after a 1,000 ton increase between 2020 and 2021. The increase could be due to improved reporting or growth in this sector. Food residual increases, as previously noted, appear to be driven by Vermont's implementation of the food residual ban. An increase in food rescue from retail partners and farm gleaning by the Vermont Food Bank also makes an important and substantial contribution to this number.

Glass diverted bested historic averages in 2022 and increased year over from 2021 by 37.2%. This includes PGA material utilized in various aggregate products by processors in the county. Materials sorted at CSWD's MRF are not considered recycled or diverted from the landfill until they are shipped from the facility.

The minimum MSW diversion rate went up from 53.7% to 55%, and the pounds per capita per day diverted increased from 3.18 to 3.26 which is the highest in ten years. For comparison, the US EPA reported that in 2018, the most recent year for which data is available, the US diversion rate was 32%. The Vermont Agency of Natural Resources reported that in 2022, also the most recent year data are available, the Vermont diversion rate was 34%. While what is included in calculations varies to some degree, rates for communities that are considered to be high performing include Seattle at 54% in 2020, San Francisco at 51% in FY 21, and Portland Metro in Oregon at 47% in 2021. Based on the diversion data and estimates of the components of waste disposed, the maximum MSW diversion rate achievable by CSWD is 81.1%.

Diverting the MSW recyclables and organics from landfill disposal reduced 2022 GHG emissions by an estimated 175,000 metric tons of carbon dioxide equivalent (MTCO₂E). This is equivalent to taking about 37,000 cars off the road or conserving over 20 million gallons of gasoline.

Using the diversion data and CSWD's estimates of the components of what is currently disposed, the estimated recovery rate for blue bin recyclables is at 82.3%, slightly lower than 83.6% in 2021. For comparison, the average recovery rate for curbside recyclables for participating households across studies compiled by The Recycling Partnership is 61.5% (*2020 State of Curbside Recycling Report*).

CSWD's estimated recovery rate for all MSW materials that are currently divertible is 67.8%, up significantly from 66.7% in 2021 and 63.9% in 2020 marking a sustained upward trend.

Construction & Demolition Debris

The tonnage of C&D landfilled increased by 6.2%, and the amount of C&D reported recycled increased by 2.1%. The estimated C&D diversion rate decreased from 71.9% to 71.1% this year. The maximum C&D diversion rate possible is estimated at 79.4%.

Asphalt and concrete recycled remained close to last year at 85,870 tons compared to 81,500 tons in 2021. Demand for these materials was down in 2020 but increased dramatically in 2021 and has been sustained in 2022. Many towns postponed road projects due to the tax revenue uncertainties caused by COVID-19. Diversion of C&D materials continued its post pandemic rebound.

MSW and C&D Combined

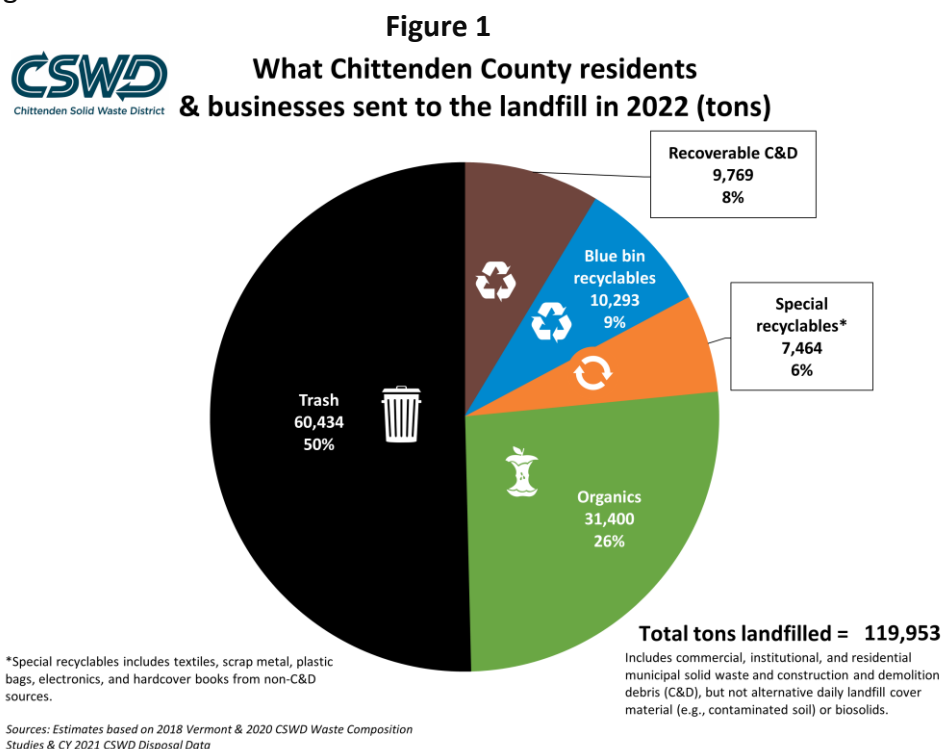
The combined estimated MSW and C&D diversion rate is 61.3% compared to 60.7% in 2021. The maximum combined diversion rate possible is estimated at 79.4%. The MSW and C&D combined pounds per capita disposed dipped from 3.79 to 3.78, while the MSW and C&D combined pounds per capita diverted increased from 5.85 to 5.99.

Alternative Daily Landfill Cover

Material used as ADC is up 3,952 tons, or 34.8%, compared to 2021. ADC consists primarily of contaminated but not hazardous soil. The number and size of projects requiring the removal of contaminated soils vary from year-to-year.

Composition of Material Sent to the Landfill

What is ultimately sent to the landfill is a mix of material that could have been diverted and materials for which there currently are no other options for disposal. Based on waste composition studies from 2018 and 2020 it is estimated 50 percent of material sent to the landfill could be recovered. See figure 1 below.



Historical Trends

Diversion and disposal data for the period 2012-2022 are included in the charts below. Figure 2 shows trends over time in MSW tons diverted versus disposed and C&D tons diverted versus disposed. MSW tons disposed in 2022 is over 5,400 tons less than it was in 2012, despite an increase in population of 11,000 over that same period. Figure 3 shows these same trends in aggregate, illustrating increased total generation and the respective disposition of materials.

The increase in tons of MSW diverted before 2020 is likely due to the business reporting requirement that was implemented in 2016 and the increased diversion of organics as Act 148 was implemented. This trend resumed in 2022.

Tons of C&D diverted experienced a significant increase during 2014-2017 when new C&D recycling facilities came online. Tons have been declining since one of the facilities closed. However, a significant rebound occurred since 2021 as the region emerged from the pandemic and construction activity remained strong.

Figure 2

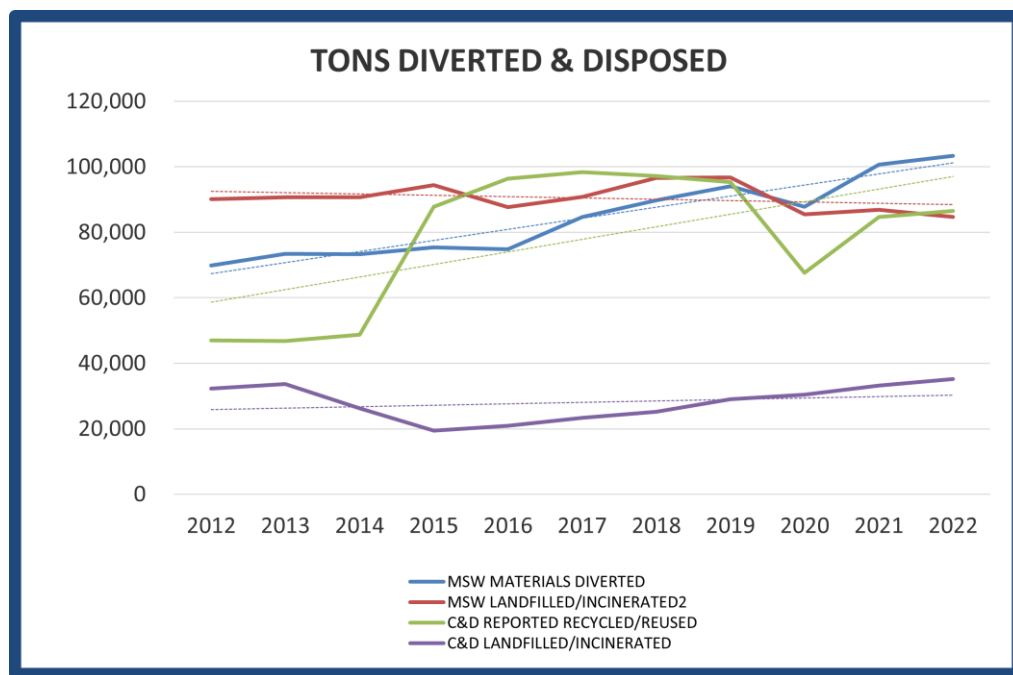


Figure 3

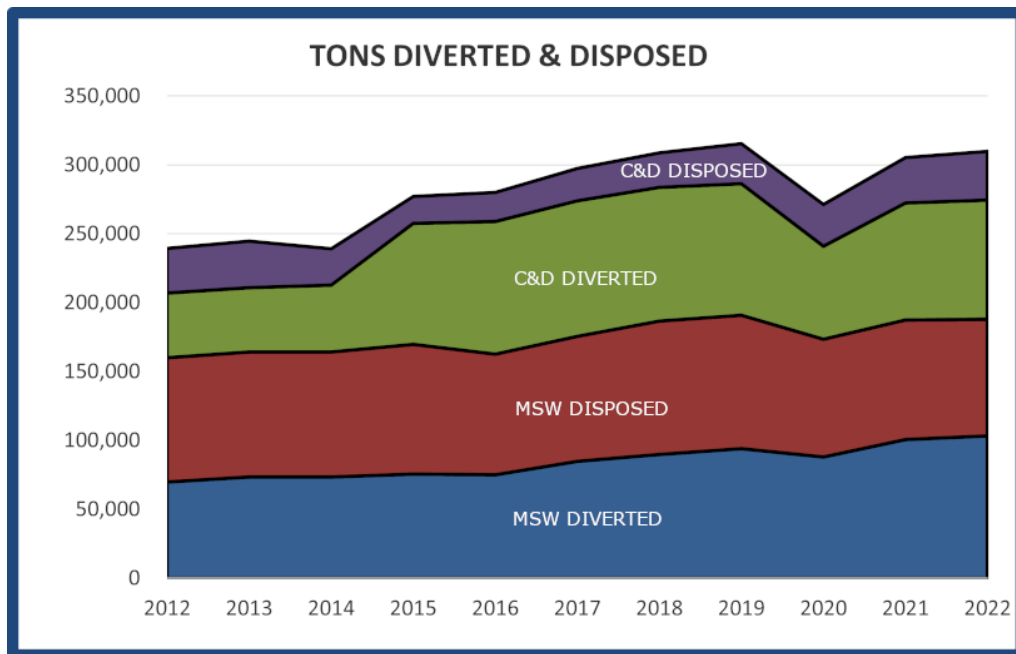


Figure 4 displays disposal rates over time. The MSW disposal rate was on an upward trend from 2016-2019 until COVID-19 arrived. The rate is currently 6.4% less than it was in 2012. The C&D disposal rate went down following the opening of C&D recycling facilities but continues to trend upward.

Figure 4

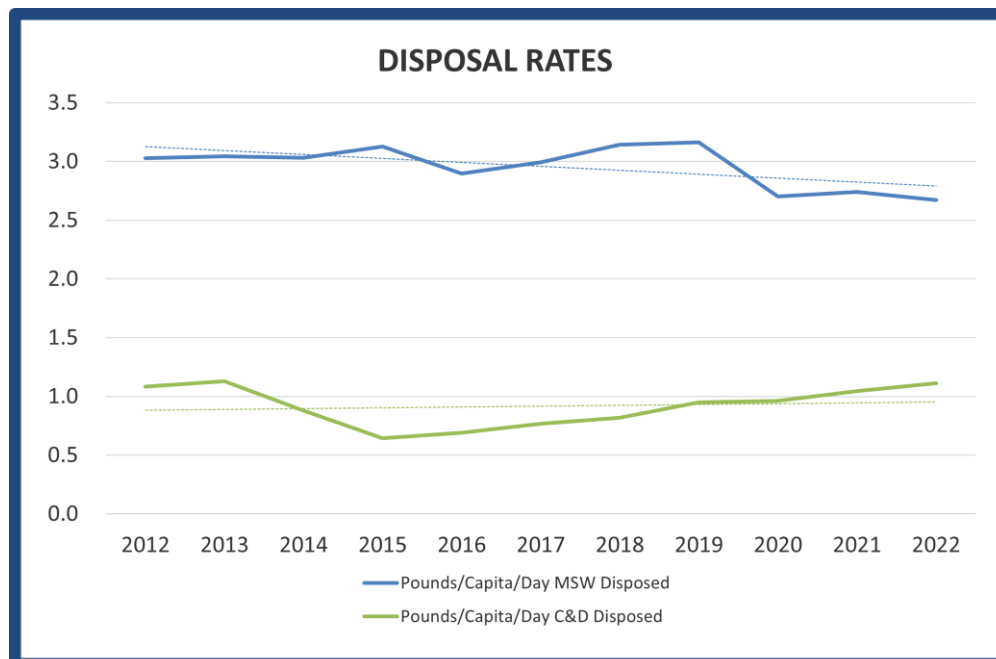
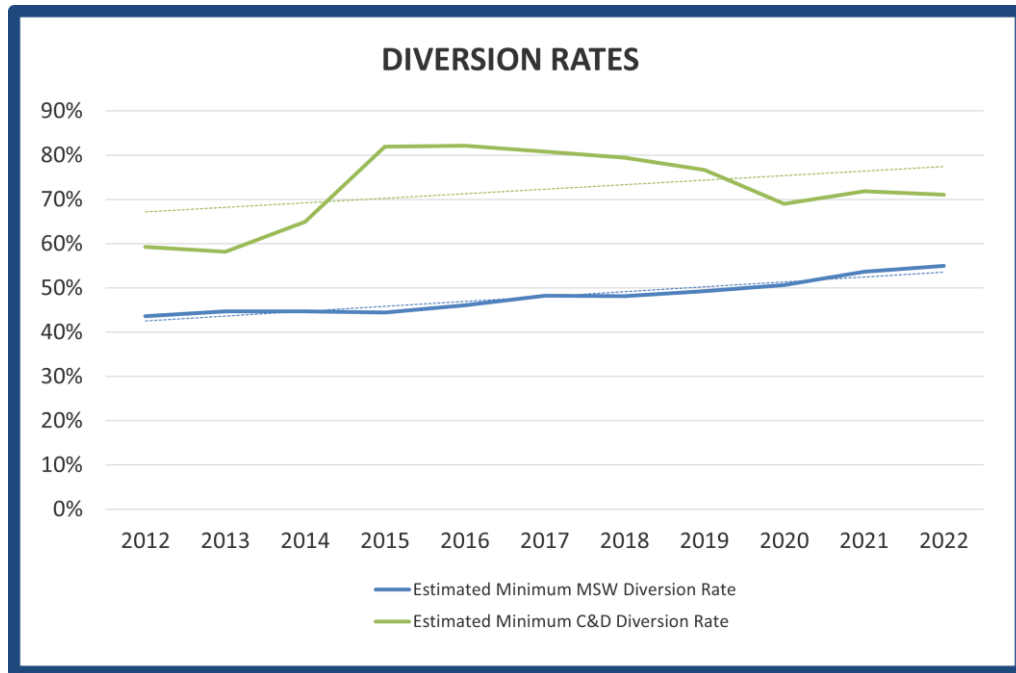


Figure 5 displays diversion rates over time. The MSW diversion rate increased over the last decade by 20.6%. The C&D diversion rate increased by 16.5%. Prior to 2021, the C&D diversion rate had increased significantly with the opening of recycling facilities but then decreased following the closure of one facility and the arrival of COVID-19. Since 2021 there appears to be a moderate rebound.

Figure 5



Conclusion

As we pass the economic impacts of COVID-19 and the economy remains strong, diversion rates are increasing and the amounts of MSW and C&D materials diverted - over 189,800 tons in 2022 - are in line with 2019 totals. As evidenced by the recovery rates for MSW recyclables and organics, however, a large quantity of recoverable material is still being disposed, perhaps as much as 60,000 tons when recoverable C&D is also included. Without changes to the current solid waste management system, including additional policies, education, enforcement, markets and facilities, it is expected that solid waste generation will continue to increase along with currently divertible waste being sent to the landfill.

CSWD WASTE DIVERSION TABLE FOR CALENDAR YEARS 2012-2022 Tons of CSWD Materials Disposed & Diverted from Disposal

MATERIALS	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	% CHG 21-22	% CHG 12-22
MSW Materials Diverted & Disposed¹													
1 Paper ²	23,924	24,439	23,685	26,303	26,743	33,199	36,723	35,215	35,348	43,211	35,724	-17.3%	33.0%
2 Plastic	1,614	1,660	1,606	1,708	1,705	1,998	2,250	2,232	2,408	2,328	2,383	2.4%	32.2%
3 Glass	2,996	4,148	4,506	3,499	3,907	3,784	3,914	3,420	4,321	3,189	4,377	37.2%	31.6%
4 Metal Cans & Foil	514	538	623	600	694	673	662	725	784	707	699	-1.0%	26.5%
5 Single-Stream Recyclables/Composite Materials	0	0	1,951	0	0	0	26	1	36	74	43	-41.9%	100.0%
6 Estimated Share of Redeemed Bottle Bill Material	4,587	4,447	4,462	4,506	4,521	4,551	4,593	4,588	4,577	4,583	4,574	-0.2%	-0.3%
7 Estimated Additional Commercial	4,905	4,935	4,955	5,011	3,024	NA	NA	NA	NA	NA	NA	NA	NA
8 TOTAL PAPER, CONTAINERS, & PACKAGING	38,540	40,167	41,788	41,626	40,594	44,206	48,169	46,180	47,474	54,092	47,799	-11.6%	19.4%
9 Estimated Backyard Composting/On-site Management	10,910	11,798	11,836	11,032	11,345	11,363	11,615	13,714	14,901	15,670	15,673	0.0%	30.4%
10 Wood ³	6,260	7,740	5,843	7,833	5,826	9,201	7,439	9,256	3,511	5,834	8,481	45.4%	26.2%
11 Reported & Estimated Yard Trimmings	5,219	4,390	4,574	4,835	5,151	5,379	5,155	5,663	5,124	4,360	3,975	-8.8%	-31.3%
12 Food Residuals & Non-recyclable Paper	2,623	3,302	3,870	4,474	5,684	6,934	10,811	12,118	10,775	14,091	19,757	40.2%	86.7%
13 TOTAL ORGANICS	25,012	27,229	26,123	28,173	28,006	32,876	35,020	40,751	34,312	39,955	47,887	19.9%	47.8%
14 TEXTILES	380	642	677	1,025	1,174	1,309	1,309	1,465	882	2,029	1,235	-39.1%	69.2%
15 SCRAP METAL	3,277	3,484	3,097	3,127	3,728	4,261	3,303	3,386	3,694	2,933	5,074	73.0%	35.4%
16 HAZARDOUS WASTE	87	123	142	113	91	109	207	186	101	98	97	-1.0%	10.3%
17 ELECTRONICS	1,025	909	964	816	777	795	666	648	440	642	470	-26.9%	-118.2%
18 TIRES ⁴	1,540	855	574	549	593	1,256	1,124	1,442	932	922	775	-15.9%	-98.7%
19 MSW MATERIALS DIVERTED	69,860	73,408	73,366	75,429	74,891	84,679	89,797	94,059	87,834	100,670	103,337	2.6%	32.4%
20 MSW LANDFILLED/INCINERATED ²	90,173	90,751	90,688	94,377	87,735	90,890	96,686	96,800	85,457	86,853	84,716	-2.5%	-6.4%
21 Pounds/Capita/Day MSW Diverted	2.35	2.46	2.45	2.50	2.47	2.79	2.92	3.07	2.78	3.18	3.26	2.6%	28.0%
22 Pounds/Capita/Day MSW Disposed	3.03	3.04	3.03	3.13	2.90	2.99	3.14	3.16	2.70	2.74	2.67	-2.5%	-13.4%
23 Estimated Minimum MSW Diversion Rate	43.7%	44.7%	44.7%	44.4%	46.1%	48.2%	48.2%	49.3%	50.7%	53.7%	55.0%	2.4%	20.6%
C&D Materials Diverted & Disposed													
24 C&D REPORTED RECYCLED/REUSED	47,012	46,833	48,786	87,799	96,354	98,404	97,181	95,404	67,658	84,703	86,491	2.1%	45.6%
25 C&D LANDFILLED/INCINERATED	32,268	33,639	26,299	19,397	20,957	23,330	25,178	29,085	30,408	33,177	35,237	6.2%	8.4%
26 Pounds/Capita/Day C&D Diverted	1.58	1.57	1.63	2.91	3.18	3.24	3.16	3.12	2.14	2.67	2.73	2.1%	42.1%
27 Pounds/Capita/Day C&D Disposed	1.08	1.13	0.88	0.64	0.69	0.77	0.82	0.95	0.96	1.05	1.11	6.2%	2.4%
28 Estimated Minimum C&D Diversion Rate	59.3%	58.2%	65.0%	81.9%	82.1%	80.8%	79.4%	76.6%	69.0%	71.9%	71.1%	-1.1%	16.5%
MSW & C&D Combined													
29 TOTAL MSW & C&D LANDFILLED/INCINERATED ²	122,442	124,391	116,987	113,773	108,691	114,220	121,865	125,885	115,865	120,031	119,953	-0.1%	-2.1%
30 Pounds/Capita/Day MSW & C&D Diverted	3.93	4.03	4.08	5.41	5.65	6.03	6.08	6.19	4.92	5.85	5.99	2.4%	34.4%
31 Pounds/Capita/Day MSW & C&D Disposed	4.11	4.17	3.91	3.77	3.59	3.76	3.96	4.11	3.66	3.79	3.78	-0.1%	-8.7%
32 Estimated Minimum MSW & C&D Diversion Rate	48.8%	49.2%	51.1%	58.9%	61.2%	61.6%	60.5%	60.1%	57.3%	60.7%	61.3%	1.0%	20.3%
Other Disposal													
33 Alternative Daily Landfill Cover	9,633	9,040	7,052	16,927	12,254	23,815	7,480	6,318	7,162	11,357	15,309	34.8%	37.1%
POPULATION ESTIMATES													
CSWD Resident Population	158,673	159,432	159,945	161,382	161,531	162,372	164,572	163,774	168,386	169,271	169,301	0.0%	6.3%
CSWD Seasonal Population ⁵	3,985	3,985	3,985	3,985	3,985	3,985	3,985	3,985	4,462	4,462	4,462	0.0%	10.7%
TOTAL POPULATION	162,658	163,417	163,930	165,367	165,516	166,357	168,557	167,759	172,848	173,733	173,763	0.0%	6.4%

¹Under a CSWD Solid Waste Management Ordinance data reporting requirement implemented in 2016, additional quantities of materials shipped by businesses directly to markets for composting, recycling, animal feed, etc. are included beginning with that year.

²Beginning in 2015, the out-of-District portion of MSW contamination at the MRF and the out-of-District portion of MSW disposed at CSWD Drop-Off Centers are subtracted from Total MSW Landfilled/Incinerated; the out-of-District portion of non-recyclable C&D at Myers Recycling Facility and CSWD Drop-Off Centers is subtracted from Total C&D Landfilled/Incinerated; and the out-of-District portion of mandatory recyclables delivered to CSWD Drop-Off Centers is subtracted from Paper. Tires that go to waste-to-energy facilities are added to MSW Landfilled/Incinerated.

³The bulk of clean wood reported each year is wood processed at the Burlington Electric Department Wood Depot. Wood is processed into wood chips and periodically moved to the inventory of the McNeil Generating Station. It is on the transfer date that tons are recorded. Consequently, large quantities processed in one year may be counted in the next year.

⁴In 2012, the total includes 832.9 tons of tires that were removed from a junk yard in Milton.

⁵The seasonal population is calculated following the instructions provided by the Vermont Department of Environmental Conservation Solid Waste Program in the document titled, "Disposal Data for SWIP Reports."

Note: Some columns may not add up to totals due to rounding.

Diversion Table Notes by Line Item

LINE 1: This line includes corrugated cardboard, boxboard, paper bags, telephone directories, magazines and catalogs, newspaper, office paper, mixed paper, hardcover and paperback books, and junk mail.

LINE 2: This line includes polyethylene terephthalate plastic (#1 plastic), high density polyethylene plastic (#2 plastic), polyvinyl chloride plastic (#3 plastic), low density polyethylene plastic (#4 plastic), polypropylene plastic (#5 plastic), polystyrene plastic (#6 plastic), plastic labeled “other” (#7 plastic), and any mixture of plastic types.

LINE 3: This line includes glass from food and beverage containers and waste glass from a manufacturing process.

LINE 4: This line includes aluminum and tin/steel beverage and food containers, aerosol cans, and aluminum foil and pie plates.

LINE 5: This line includes 1) paper and container recyclables mixed together that were shipped to facilities outside of Chittenden County for sorting and marketing and 2) composite materials that were shipped for recycling.

LINE 6: This line is an estimate of the bottles and cans redeemed under the Bottle Bill. The estimate is based on Chittenden County’s share, based on population, of estimates provided by Vermont ANR.

LINE 7: This line is an estimate of the quantities of materials recycled by businesses that are not reported to CSWD. The estimate is based on a study conducted by DSM Environmental Services for CSWD in 2007. Quantities for businesses in the study that began reporting directly to CSWD in 2016 or have closed are subtracted from the estimate. In 2017, the estimate was eliminated due to direct reporting by businesses.

LINE 9: Participation rates in on-site management of food scraps and yard trimmings are obtained from CSWD’s biennial household solid waste surveys. A national study conducted in 1995 for the U.S. Environmental Protection Agency and the Composting Council by Applied Compost Consulting found an average of 650 pounds of material was diverted per household per year through backyard composting. This amount is used to calculate this line.

LINE 10: This line includes tree limbs, brush, pallets, and dimensional lumber that have never been painted, stained, or treated and do not have adhesives, such as plywood or particle board.

LINE 11: This line includes grass clippings, leaves, weeds, flowers, pine needles, and garden plants.

LINE 12: This line includes discarded food, food-soiled paper, and oils from restaurants, cafeterias, grocery stores, food and beverage product manufacturers, other businesses, and residents that were composted, anaerobically digested, donated for human consumption, or used as animal feed.

LINE 14: This line includes clothing and other textiles collected from Drop-Off Centers and private processors.

LINE 15: This line includes metal items such as car parts, furniture, batteries, sheet metal, oil filters, propane cylinders, bicycles, lawn mowers, outdoor grills, and appliances. It does not include scrap metal delivered directly to scrap metal dealers by generators except for those materials reported by businesses and recycling processors.

LINE 16: This line includes antifreeze; mercury-added products, including fluorescent light tubes; paint and other products redistributed through CSWD’s Hazbin Reuse Program; rebled paint

sold by the Environmental Depot; and paint shipped from the Depot for recycling. It also includes some of the items recycled by private businesses offering collection programs beginning in 2016.

LINE 17: This line includes computer and other electronic equipment shipped for processing (recycling and reuse).

LINE 18: This line includes tires from bicycles, motorcycles, cars, trucks, and off-road vehicles that were recycled into new products or reused.

LINE 20: This line includes municipal solid waste (MSW) that was disposed in landfills or incinerated including tires that went to waste-to-energy facilities.

LINE 23: Estimated Minimum MSW Diversion Rate = $\text{Total MSW Materials Diverted} / (\text{Total MSW Materials Diverted} + \text{Total MSW Landfilled/Incinerated})$.

LINE 24: This line includes construction materials such as asphalt, concrete, brick, drywall, wood, scrap metal, and asphalt shingles.

LINE 25: This line includes construction and demolition waste that was disposed in landfills or incinerated, including material, such as fines from C&D recycling processing and other C&D debris, used for landfill site improvements (road building).

LINE 28: Estimated Minimum C&D Diversion Rate = $\text{C\&D Recycled} / (\text{C\&D Recycled} + \text{Total C\&D Landfilled/Incinerated})$.

LINE 32: Estimated Minimum MSW & C&D Diversion Rate = $(\text{Total MSW Materials Diverted} + \text{C\&D Recycled}) / (\text{Total MSW Materials Diverted} + \text{C\&D Recycled} + \text{Total MSW Landfilled/Incinerated} + \text{Total C\&D Landfilled/Incinerated})$.

LINE 33: This line includes materials that were used as alternative daily cover at a landfill (e.g., contaminated soil, catch basin grit).