

# APPENDIX E Residential/Commercial Reduction and Recycling Data

## A. Reference Year Recovery Data

The purpose of this plan section is to report data about the type and quantity of materials that were recovered from residential and commercial waste in the Reference year, 2018. The tables in Appendix E report recycling information organized by the source of the diverted material, or the programs and services that were used to collect the material. The District gathers data from several sources using a variety of methods. The sources, methods, and the steps taken to avoid double counting of material that is reported by more than one entity will be explained following the appropriate table.

Excluded material: Only materials from residential and commercial sources can be included in the recycling quantities credited to residential/commercial recycling and waste reduction. Materials that cannot normally be deposited in municipal solid waste landfills or that have not traditionally been landfilled cannot be credited. The excluded materials include construction and demolition debris, metals from railway boxcars and vehicle salvage operations (no car parts, except lead acid batteries), auto bodies, farm equipment, or buses, agricultural waste including crop residue and animal manure, and municipal sewage sludge.

To obtain commercial recycling data, the District sends out an annual survey to local businesses. A sample copy of the survey and the commercial survey mailing list is included in Appendix R. The results of the District’s 2018 survey are entered in Table E-1. The results are grouped by NAICS (North American Industry Classification System) codes. Note that code numbers and material categories for which no material was reported have been omitted from the table supplied in the Plan 4.0 format. All amounts are reported in tons rounded to the nearest whole number. A “0” in a table cell indicates that some material was reported, but it was less .5 tons, so the amount was rounded to “0” . An empty cell means no recycling was reported.

**Table E-1 Commercial Survey Results**

NAICS	LAB	FM	NFM	OCC	MxP	Other Used Motor Oil	Total
42 - wholesale distribution	0	1	35	573	3		612
44 – retail trade	2	12	2	16		7	40
45 – retail trade			0				0
<b>Total</b>	2	13	37	589	3	7	652

Materials abbreviations: LAB-lead acid batteries, FM-ferrous metals, NFM-non-ferrous metals, OCC-corrugated cardboard, MxP-mixed paper. Columns for MATERIALS that were NOT reported have been omitted from this Table.

Table E-1 comments:

Source: Survey results from 2018 ADR surveys compiled by the Darke SWMD.

Calculations and assumptions: No adjustments were required. Commercial businesses reported the recycling service provider that collected their materials. Responses for recyclables that were collected by Rumpke were not tallied for individual business. The materials collected by Rumpke are included only in the recycling reported by Rumpke. The materials were not double counted.

**Table 2-E. Data from Other Recycling Facilities**

Source of Materials/Data	GI	FM	NFM	OCC	MxP	PI	W	Total
<b>Buybacks - None</b>								
None reported								
<b>Scrap Yards</b>								
None reported								
<b>Brokers</b>								
None Reported								
<b>Processors/MRF's</b>								
Rumpke Center City - Hamilton Co. - Commercial	507	90	57	701	1,750	303		3,408
Rumpke Elmwood-Commercial				24				24
Rumpke Recycling Commercial-Dayton	3	2	1	83	47	9	14	159
Rumpke Recycling Residential-Dayton	1	1		1	12	2		17
<b>Total Processors/MRFs</b>	<b>511</b>	<b>93</b>	<b>58</b>	<b>809</b>	<b>1,809</b>	<b>314</b>	<b>14</b>	<b>3,608</b>

Materials abbreviations: GI-glass, FM-ferrous metals, NFM-non-ferrous metals, OCC-corrugated cardboard, MxP-mixed paper, PI-Plastic, , W-wood. Totals for material may vary slightly from the sum of the numbers shown in rows due to rounding.

Columns for materials that were NOT reported have been omitted from this table.

Source :2018 Ohio EPA Material Recovery Facilities Report

Calculations: No adjustment for double counting was needed in Table E-2. Commercial materials that were sent to these facilities were not included in the commercial or residential data reported in Table E-1, E-3, or E-4.

Table E-3 Data Reported to Ohio EPA

Ohio EPA Data Source	GI	PI	OCC	MxP	NFM	FM	W	Other NR	Total
Wal-Mart Recycling		22	379	2	0			87	490
Lowe's Companies, Inc		1	21		2	45	5		74
Dollar General			125	1					126
Kroger		49	315	3				8	375
U.S. Postal Service		1	3	52					56
<b>Total</b>	<b>0</b>	<b>73</b>	<b>842</b>	<b>58</b>	<b>2</b>	<b>45</b>	<b>5</b>	<b>95</b>	<b>1,121</b>

Materials abbreviations: GI-glass, PI-plastic, OCC-corrugated cardboard, MxP-mixed paper, NFM-non-ferrous metal, FM-ferrous metal, W-wood, Other NR-other material. The specific type of material was not reported. .

Source(s) of Information: Source :2018 Ohio EPA Survey of Chain Stores and MRF Report.

Calculations: No adjustment for double counting was needed.

The following table, Table E-4, reports residential and commercial recycling data not included in the three previous tables. This data was collected from a variety of sources. Information regarding the sources may provide insight into the recycling programs and events that contribute to waste reduction in the District. For that reason, we are highlighting the sources of the information in this narrative rather than in comments following the table.

The Village of Versailles provides waste and recycling collection to all households, many commercial businesses, and several small manufacturers. The Village reports curbside collection results directly to the District. The adjustment in Table E-4 subtracts 5 tons of material reported as comingled that was also reported by a manufacturer that named the Village of Versailles as the collector. This amount is included in industrial recycling and has been subtracted from this residential/commercial table.

The residential material listed as being recycled through the Rumpke Dayton material recovery facility was not listed in Table E-2. It is listed in this table to make comparisons with recycling as reported in the District’s 2018 ADR easier.

Composting facilities: The data for composting facilities is from the OEPA published Compost Facility Data Report for 2018 facilities: Fresh Aire Farms, Fitzwater Composting, and Versailles Village Compost Facility.

Alternative Yard Waste Management: These yard waste programs consist of autumn leaf collection provided by Villages. The amount of yard waste diverted is reported to the District. The conversion factors used to calculate tons diverted are shown following Table E-4.

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District special collection programs and events: The District provides collection programs for difficult to manage wastes. The amounts collected by the HHW Collection Event, Paper Shredding Day, and the Appliance and Electronics Recycling Event are reported in Table E-4. The District manages a popular Plastic Cap collection program. The caps collected are listed under plastic.

The District collects small household dry cell batteries for recycling. The amount collected is entered in Table E-4 as zero, "0". In this and other tables "0" in a cell indicates that an amount was reported, but it was less than half a ton (.5) so it was rounded to zero. The cell is left blank if no recycling of that material was reported.

The District also sponsors a Scrap Tire Event. The amount collected in the tire event is included in the scrap tire data which is collected and reported by Ohio EPA. Scrap tires from the District are managed by several haulers/recyclers.

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**Table E-4 Other Recycling Programs/Other Sources of Data**

Other Programs or Sources of Data	APP	HHW	EW	FW	NF	OCC	MxP	PI	CoM	YW	Tires	Total
Curbside Recycling Services- Village of Versailles					92	135			279			506
<i>Drop-off Recycling Locations: The amounts collected at all District drop-offs is included in Rumpke MRFs Table E-2</i>												0
Composting Facilities\YW										3,755		3,755
Food Composting				144								144
Alternative Yard Waste Mgt. Activities										58		58
Scrap Tire Data reported to OEPA											635	635
District Special Collection Events:												0
Electronics and Appliance Recycling Day	6		24									30
HHW Waste Event		2										2
Paper Shredding Day							5					5
Plastic Bottle Caps Collection								4				4
Household Battery Collection; Note 2												0
<b>Unadjusted Total</b>	<b>6</b>	<b>2</b>	<b>24</b>	<b>144</b>	<b>92</b>	<b>135</b>	<b>5</b>	<b>4</b>	<b>279</b>	<b>3,813</b>	<b>635</b>	<b>5,140</b>
<b>Adjustments (Industrial recycling reported by Versailles Curbside)</b>							0		5			5
<b>Adjusted Total</b>	<b>6</b>	<b>2</b>	<b>24</b>	<b>144</b>	<b>92</b>	<b>135</b>	<b>5</b>	<b>4</b>	<b>274</b>	<b>3,813</b>	<b>635</b>	<b>5,135</b>

Materials abbreviations: APP-appliances, HHW-household hazardous waste, EW, Electronic waste, FW-food waste, GI-glass, FM-ferrous metals, NFM-non-ferrous metals, OCC-corrugated cardboard, MxP-mixed paper, PI-Plastic, , CoM-comingled recyclables, W-wood, YW-yard waste.

Calculation : Total reported recycling – adjustment for industrial material that was collected and reported by Versailles. It is included in industrial recycling totals.

Assumptions: The Villages listed under “Other Yard Waste Management Activities” reported leaf collection methods, number of loads, cubic yards per load. The conversion factors used to calculate weight in tons: chipped brush-243 lbs./cu. yd; vacuumed leaves-500 lbs./cu. yd./ dry leaves 250 lbs/cu. yd.

Table E-5 Residential/Commercial Material Recovered in Reference Year

Material	Quantity (tons)
Appliances/ "White Goods"	6
Household Hazardous Waste	2
Used Motor Oil	7
Electronics	24
Scrap Tires	635
Dry Cell Batteries	0
Lead-Acid Batteries	2
Food	144
Glass	511
Ferrous Metals	151
Non-Ferrous Metals	189
Corrugated Cardboard	2,375
All Other Paper	1,875
Plastics	391
Textiles	0
Wood	19
Rubber	0
Commingled Recyclables (Mixed)	274
Yard Waste	3,813
Other (Aggregated)	95
<b>Total</b>	<b>10,515</b>

Source and assumptions: The information regarding the amount of the materials recycled by material type is compiled from the survey data reported in Tables E-1 *Commercial Survey Results*; E-2 *Data from Other Recycling Facilities*, E-3 *Data Reported to Ohio EPA* and E-4. *Other Recycling Programs/Other Sources of Data*. The sources of the data, the means of collection, and methods to avoid double counting are reported for each of the previous four tables.

Note: In this table and in other tables in the Plan, the total shown may vary from the sum of the whole numbers shown on the table by +1 or -1. This is due to rounding to simplify the presentation of the data.

**Table E-6 Quantities Recovered by Program/Source**

<b>Program/Source of R/C Recycling Data</b>	<b>Quantities (Tons)</b>
Commercial Survey	652
Data from Other Recycling Facilities	3,608
Ohio EPA Commercial Retail Data	1,121
Curbside Recycling Services- Village of Versailles	501
Drop-off Recycling Locations: The amounts collected at all District drop-offs is included in Rumpke MRFs Table E-2. Not entered here.	
Composting Facilities/YW	3,755
Food Composting	144
Scrap Tire Data reported to OEPA	635
Alternative Yard Waste Management	58
Electronics and Appliance Recycling Day	30
HHW Waste Event	2
Paper Shredding Day	5
Plastic Bottle Caps Collection	4
Household Battery Collection; Note 2	0
<b>Total</b>	<b>10,515</b>

Source and assumptions: The information regarding the amount of the materials recycled by material type is compiled from the survey data reported in Tables E-1 *Commercial Survey Results*; E-2 *Data from Other Recycling Facilities* , E-3 *Data Reported to Ohio EPA* and E-4. *Other Recycling Programs/Other Sources of Data*. The sources of the data, the means of collection, and methods to avoid double counting are reported for each of the previous four tables.

**B. Historical Recovery**

The Tables that follow report residential/commercial recovery for the four years preceding the reference year and the reference year.

Because the data from “Other yard waste management activities,” varies so much from year to year depending on whether or not villages or townships reported data the amounts are consolidated in the following tables. Future projections for this category will be based on the consolidated data. The calculation is shown in Table E-6a.

**Table E-6a Other Yard Waste Management Activities Historic Data**

Year	Ansonia brush chipped for mulch	Gettysburg Village - leaves field spread	New Madison - leaves field spread	Pittsburg Village - leaves field spread	Alternative YW management total
2014	238		26.67	55	320
2015			68	47	115
2016	12		25		37
2017	8	27	29	20	84
<b>2018</b>	<b>9</b>	<b>11</b>	<b>19</b>	<b>19</b>	<b>58</b>

Source: Data collected for and reported in the District’s annual district reports.

Calculation: The “Alternative yard waste management total” for each year is the total reported by the listed communities.

Assumptions: The Villages listed under “Other Yard Waste Management Activities” reported leaf collection methods, number of loads, cubic yards per load. The following conversion factors were used to calculate weight in tons:

chipped brush-243 lbs./cu.yd; vacuumed leaves-500 lbs/cu.yd./ dry leaves 250 lbs/cu.yd.

**Historical Residential/Commercial Recovery by Program/Source**

The tables that follow include all of the programs and data sources that contribute to annual residential/commercial waste recovery. The recovery total includes the amount of residential/commercial material recycled, yard and food waste composting, and alternative methods of diverting yard waste (primarily leaves), from disposal. Incineration is not a method used by the District.

The information in Table E-7 is from the data collected for the District’s Annual District Reports (ADR). The amounts reported in some categories and the annual totals vary from the amount reported in the ADR’s as originally submitted to OEPA. We reviewed the data that was used, and the tables used to calculate the data and found several errors which were corrected for this plan.



**Discussion of differences in residential/commercial recycling data reported in Annual District Reports (ADR) and the corrected data presented in this Plan.**

2014: The District reported 11,697 tons recycled in the ADR. The corrected amount used in this Plan is 10,423 tons. This plan reports 1,272 tons less than reported in the 2014 ADR. Due to an error in the spread sheet used for calculating recycling, 972 tons of yard waste that was reported as processed in 2013 was included. The processor did not report any material processed in 2014. The 2013 data should not have been used because there was not follow-up to verify that the processor received material from the District in 2014. The data was included in a hidden cell and the discrepancy went undetected.

In addition, 272 tons of rubber was subtracted. In reviewing the data, it was decided that the District had misclassified this material as commercial for several years. It should have been classified as industrial material. We also found that 26 tons of cardboard and 2 tons of plastic appeared to have been included in error.

2018, The Reference Year: The amount reported in the ADR was 10,716 tons residential/commercial recycling. The amount used in this plan is 10,515 tons. The difference is 211 tons. 204 tons of rubber and 6 tons of wood was reclassified as industrial material resulting in a reductions of residential/commercial recycling in 2018 and an increase in reported industrial recycling.

2019: Correction of the error regarding the treatment of rubber resulted in subtracting 204 tons of rubber from commercial/residential recycling. The total amount of residential, commercial reported in the ADR was 8,922 tons. The corrected amount is 8,923 tons.

Tables E-7a1, E-7a2, E-7a3 , and E-7a4 are all derived from the Table E-7 data.

**Table E-7 Historical Residential/Commercial Recovery by Program/Source**

Year	Commercial Survey	Data from Other Recycling Facilities	Ohio EPA Commercial Retail Data	Curbside Recycling Services-Village of Versailles	Drop-off and curbside – reported in Data from other Recycling Facilities	Composting Facilities Yard Waste	Food Waste Composting	Scrap Tire Data reported to OEPA	Alternative YW management Total	Electronics and Appliance Recycling Day	HHW Waste Event	Paper Shredding Day	Plastic Bottle Caps Collection	Household Battery Collection	Totals
2014	2,292	3,164	1,305			2,616	262	420	320	36	0	6		2	<b>10,423</b>
2015	4,286	5,353	898			3,294	237	596	115	31	10	6		2	<b>14,828</b>
2016	1,015	4,620	837	371		4,025	0	546	37	39	10	9		2	<b>11,511</b>
2017	624	4,342	1,240	511		4,122	202	710	84	38	10	4			<b>11,887</b>
2018	652	3,608	1,121	501	0	3,755	144	635	58	30	2	5	4	0	<b>10,515</b>

Source: data compiled for Annual District Reports. Methods of data collection and methods to avoid double counting are the same as those use in collection the 2018, reference year data.

**Table E-7a1 Annual Percent Change in Tons Recovered**

Year	Commercial Survey	Data from Other Recycling Facilities	Ohio EPA Commercial Retail Data	Curbside Recycling Services-Village of Versailles	Drop-off Recycling Locations: The amounts collected at all District drop-offs is included in Rumpke MRFs	Composting Facilities Yard Waste	Food Waste Composting	Scrap Tire Data reported to OEPA	Alternative YW management Total	Electronics and Appliance Recycling Day	HHW Waste Event	Paper Shredding Day	Plastic Bottle Caps Collection	Household Battery Collection	Totals
2014															
2015	87%	69%	-31%			26%	-10%	42%	-64%	-14%		0%			42%
2016	-76%	-14%	-7%			22%	-100%	-8%	-68%	26%	0%	50%			-22%
2017	-39%	-6%	48%	38%		2%		30%	127%	-3%	0%	-56%			3%
<b>2018</b>	<b>4%</b>	<b>-17%</b>	<b>-10%</b>	<b>-2%</b>		<b>-9%</b>	<b>-29%</b>	<b>-11%</b>	<b>-31%</b>	<b>-21%</b>	<b>-80%</b>	<b>25%</b>			<b>-12%</b>

Calculation for percent change example using Commercial survey Data column 2. 2015 tons minus 2014 tons = difference in tons divided by 2015 tons equals the percent of change.

4,286-2292 = 2,094      2,094 / 2,292 = .869 or 87% (rounded and expressed as a percent).

Table E-7a2 Average Percent Change in Tons Recovered

Commercial Survey	Data from Other Recycling Facilities	Ohio EPA Commercial Retail Data	Curbside Recycling Services-Village of Versailles	Drop-off Recycling Locations: The amounts collected at all District drop-offs is included in Rumpke MRFs	Compost-ing Facilities Yard Waste	Food Waste Composting	Scrap Tire Data reported to OEPA	Alternative YW management Total	Electronics and Appliance Recycling Day	HHW Waste Event	Paper Shredding Day	
-6%	-1%	0%	18%	0%	10%	-46%	13%	-9%	-3%	-27%	5%	Average percent change all categories 3%

Calculation: Average percent change: add positive and subtract negative numbers for the four years, 2015 through 2018, and divide the total by 4.  
 (87% - 76% - 39% + 4%) = -24%/4 = -6%

Table E-7a3 Annual Per Capita Recovery Rate (pounds/person/day)

Year	Commercial Survey	Data from Other Recycling Facilities	Ohio EPA Commercial Retail Data	Curbside Recycling Services-Village of Versailles	Drop-off Recycling Locations: The amounts collected at all District drop-offs is included in Rumpke MRFs Table E-2	Compost-ing Facilities Yard Waste	Food Waste Composting	Scrap Tire Data reported to OEPA	Alternative YW management Total	Electronics and Appliance Recycling Day	HHW Waste Event	Paper Shredding Day	Plastic Bottle Caps Collection	Household Battery Collection; Note 2	Totals
2014	0.24	0.43	0.14			0.27	0.03	0.04	0.03	0.00	0.00	0.00			1.09
2015	0.46	0.57	0.10			0.35	0.03	0.06	0.01	0.00	0.00	6.00		0.00	1.58
2016	0.11	0.50	0.09	0.04		0.43	0.00	0.06	0.00	0.00	0.00	9.00		0.00	1.24
2017	0.07	0.47	0.13	0.06		0.45	0.02	0.08	0.01	0.00	0.00	0.00			1.29
2018	0.07	0.39	0.12	0.05	0.00	0.41	0.02	0.07	0.01	0.00	0.00	0.00	0.00	0.00	1.13

Calculation: Tons \* 2000 pounds equals total pounds for the year. Divide total pounds by 365 days to get pounds per day for the entire District. Divide pounds per day by the population of the District to calculation the pounds per person per day. 2018 total recovery 11,515 tons x 2000 lbs = 21,030,000 lbs. divided by 365 days = 63.095 lbs. per day divided by population in 2018 of 50.784 =1.13 pounds/person/day

**Figure E-1: Historic Recovery Residential/Commercial**

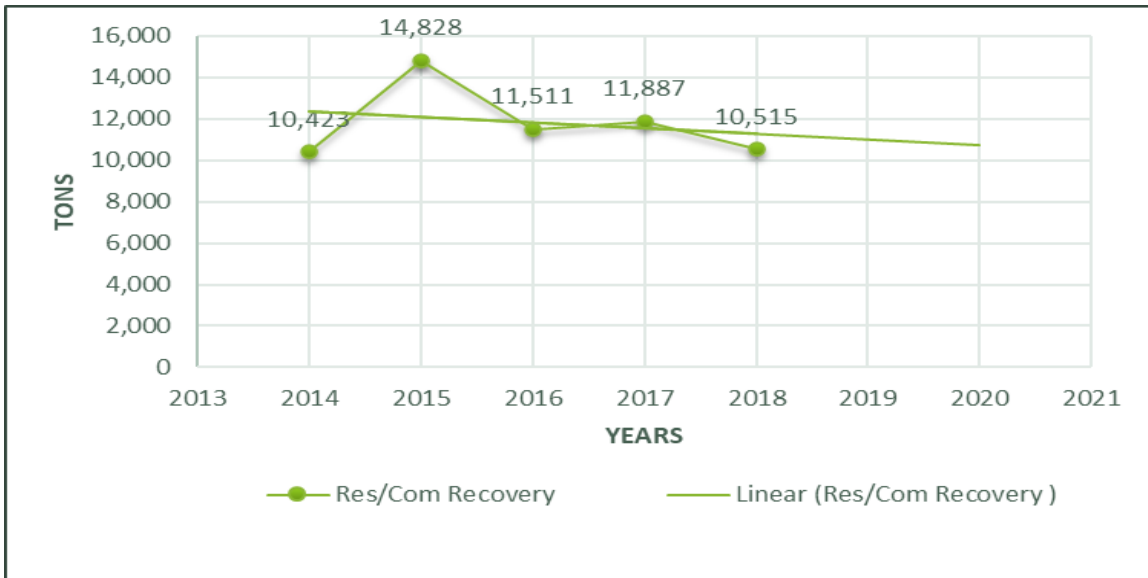


Figure E-1 illustrates the recycling trends over five years. Not including this spike up in 2015, the amounts recycled stayed about the same over the five years. The amount recycled per person per year in 2018 was not significantly more than in 2014.

**C. Residential/Commercial Recovery Projections by Source**

Historical program data was considered in the projections shown in Table E-8. The categories were modified in order to link the projections to District programs while recognizing that the District does not have total control over the way that some of the data is collected and reported to the District. For example, all of the reported curbside with the exception of Versailles and all of the drop-off recyclables in the reference year and in 2019 were collected by one hauler, Rumpke. The material is weighed and recorded at the MRF and the data that is reported to the District is the total weight, broken down into the weights of each material type but not reported by the specific type of program or location from which it was collected. Therefore, it is not possible to accurately separate the amount collected through drop-offs, curbside, and commercial sources.

Explanations for each of the projections by program or data source is provided following Table E-8. Projections are included for the years between the reference year and the first year of the planning period. The 2019 amounts use actual data collected for the District’s annual report to OEPA. Due to the disruption from Covid-19 during the time when the District was collecting data, responses were fewer than expected. We believe this drastically reduced the amount of commercial recycling reported. In addition, Covid -19 disrupted some District programs in 2020. We anticipate 2020 waste disposal and recovery amounts may be unusual; early observations from waste haulers suggest that the amount of both residential waste disposal and recycling

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has increased. However, we do not have real data to inform 2020 predictions at this time. Therefore, the projections for the planning period will depend primarily on the historic data and the review and analysis of District circumstances and programs. This analysis is the subject of Appendices H and I.

**Table E-7a4 Adjusted Average Annual Per Capita Recovery Rate (pounds/person/day with highest and lowest year data eliminated)**

Year	2014	2015	2016	2017	2018	Average ppd	Adjusted Average ppd
Commercial Survey	0.24	0.46	0.11	0.07	0.07	0.19	0.14
Data from Other Recycling Facilities	0.43	0.57	0.50	0.47	0.39	0.47	0.46
Ohio EPA Commercial Retail Data	0.14	0.10	0.09	0.13	0.12	0.12	0.12
Curbside Recycling Services- Village of Versailles	0.00	0.00	0.04	0.06	0.05	0.03	0.05
Composting Facilities	0.27	0.35	0.43	0.45	0.41	0.38	0.40
Other Food and Yard Waste Management Activities	0.03	0.03	0.00	0.02	0.02	0.02	0.02
Scrap Tire Data reported to OEPA	0.04	0.06	0.06	0.08	0.07	0.06	0.06
Alternative YW management Total	0.03	0.01	0.00	0.01	0.01	0.01	0.01

Calculation: The adjusted average is calculated by eliminating the highest and lowest pound per person per day in each category. The shaded cells contain the eliminated amounts. Darke County SWMD offers a small data base . A few changes in the businesses or facilities that respond to surveys can make a major difference in the reported amounts The adjusted method helps level the spikes and valleys and may give a better picture of the amounts that can be expected in the future. .

Table E-8: Residential/Commercial Recovery Projections by Program/Source

Year	Commercial Survey	Data from Other Recycling Facilities	Ohio EPA Commercial Retail Data	Curbside Recycling Services-Village of Versailles	Drop-off and Rumpke Curbside included in Rumpke MRFs Table E-2	Composting Facilities	Other Yard Waste Management Activities	Food Composting	Scrap Tire Data reported to OEPA	Electronics and Appliance Recycling Day	HHW Waste Event	Paper Shredding Day	Plastic Bottle Caps Collection	Household Battery Collection; Note 2	Totals
<b>2018</b>	<b>652</b>	<b>3,608</b>	<b>1,121</b>	<b>501</b>	<b>0</b>	<b>3,755</b>	<b>58</b>	<b>144</b>	<b>635</b>	<b>30</b>	<b>2</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>10,515</b>
2019	20	3,238	1,320	400		2,969	57	158	516	22	2	8	5	3	<b>8,719</b>
2020	195	3,238	1,320	400		2,969	57	158	516	22	2	8	5	3	<b>8,894</b>
2021	195	3,238	1,320	455		3,625	57	158	516	22	2	8	5	3	<b>9,605</b>
2022	521	3,238	1,320	452		3,602	57	158	516	22	2	7		3	<b>9,899</b>
2023	1,253	3,341	1,320	449		3,580	57	158	516	22	2	7		3	<b>10,709</b>
2024	1,245	3,499	1,320	446		3,557	57	158	516	22	2	7		3	<b>10,833</b>
2025	1,237	3,655	1,320	443		3,534	57	158	516	22	2	7		3	<b>10,955</b>
2026	1,231	3,812	1,320	441		3,514	57	158	516	22	2	7		3	<b>11,083</b>
2027	1,224	3,812	1,320	438		3,495	57	158	516	22	2	7			<b>11,051</b>
2028	1,217	3,812	1,320	436		3,475	57	158	516	22	2	7			<b>11,022</b>
2029	1,210	3,812	1,320	434		3,455	57	158	516	22	2	7			<b>10,992</b>
2030	1,203	3,812	1,320	431		3,435	57	158	516	22	2	7			<b>10,963</b>
2031	1,196	3,812	1,320	429		3,415	57	158	516	22	2	7			<b>10,934</b>
2032	1,189	3,812	1,320	426		3,396	57	158	516	22	2	7			<b>10,905</b>
2033	1,182	3,812	1,320	424		3,376	57	158	516	22	2	7			<b>10,876</b>
2034	1,175	3,812	1,320	421		3,356	57	158	516	22	2	7			<b>10,847</b>
2035	1,168	3,812	1,320	419		3,336	57	158	516	22	2	7			<b>10,817</b>
2036	1,165	3,812	1,320	418		3,328	57	158	516	22	2	7			<b>10,805</b>
2037	1,162	3,887	1,320	416		3319	57	158	516	22	2	7			<b>10,868</b>
2038	1,159	3,877	1,320	415		3311	57	158	516	22	2	7			<b>10,845</b>

Planning period: 2022 through 2036

**Commercial Survey:** The District sends a mail survey to local commercial businesses. This survey is sent to businesses except the large chain operations which are surveyed by Ohio EPA. The businesses include banks, automotive supply and service providers, resale shops, retirement and nursing facilities, other retail stores, and wholesale distributors. The survey includes questions regarding waste and recycling service providers used so that double counting can be eliminated. Unfortunately, even using phone follow-up, the responses from businesses have been sporadic. The number and type of businesses that respond varies from year to year making it difficult to make comparisons and predictions. The reported recycling by the businesses surveyed by the District has substantially decreased. However, there are no clear indications that the actual amount of commercial recycling has decreased as much. This Plan includes strategies that are targeted at increasing the number of businesses that recycle. The District also is working on changes in commercial survey strategy that may improve the number of responses.

The amount projected for 2020 is the 30% of the amount reported in the reference year. This is a conservative projection because of the very small amount of commercial reporting of 2019 data. The District is more aggressively following up on 2020 surveys, but Covid-19 made 2020 an unusual year. The District does not know the effect that business shutdowns and changes in consumer buying patterns may have had on commercial waste generation and recycling. The projections for 2021 is held at 2020 levels. The District believes strategies in this Plan will result in increases in actual commercial recycling and in report responses from the commercial sector. In 2022, the projection is based on returning to 80% of the amount reported in the reference year. The amount for 2023 and the remainder of the planning period is calculated using the adjusted average ppd, which is .14.<sup>1</sup>This is the average of the 5 year period 2014 through 2018 after the highest and lowest amount was deleted. Note that the annual amount decreases in direct proportion to the projected decrease in population.

Calculation for the planning years:  $((.14\text{ppd} \times \text{population}) \times 365 \text{ days}) / 2000 \text{ lbs.} = \text{tons recycled per year rounded to the nearest whole number.}$

**Data from Other Recycling Facilities – Rumpke MRFS:** The data in this category was collected and reported by Ohio EPA. Rumpke Waste and Recycling reports all the residential, commercial, and industrial material that is collected and processed from the District to OEPA. This data is very important to the District because it includes almost all of the residential curbside material that is collected (A small percentage of residential customers are serviced by other haulers.) and all of the recyclable material that is collected through the District sponsored drop-off locations. In addition, the MRF reports from Rumpke include a substantial percentage of the commercial and institutional recycling from the District. The District made adjustments to avoid double counting by not including recycled material that is identified as collected by Rumpke in the Commercial Survey results category. (See commercial survey description above.)

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<sup>1</sup> This is the rounded amount used to simplify tables. The actual amount used for the calculation in Table E8 is .1388 ppd.

The Rumpke commercial/residential data is considered third party data because the District uses data the reported by Rumpke to Ohio EPA from material processing facilities. Since Rumpke provides the majority of residential curbside recycling and services all of the drop-off recycling sites provided by the District, the amount of material that is processed and reported from the District should reflect the District's efforts to increase participation in curbside recycling. The District also anticipates increases in residential drop-off recycling when the District adds the planned full time urban recycling drop-off site and when full-time rural drop offs that were removed are replaced (see Appendix J-Table 1). Therefore, the District is projecting small increases in "Data from Other Recycling Facilities."

The amount entered for 2019 is the amount reported to Ohio EPA by Rumpke. The projection for 2020, 2021, and 2022 is the same as that for 2019. The calculated ppd in 2019 is .35 ppd.

The District believes that a renewed focus on increasing both the quantity and quality of residential and commercial recycling participation in the early years of the planning period will result in measurable increases in the material that is delivered and processed by the Rumpke material recovery facilities resulting in an small increases in the average ppd. The projection for 2023 is calculated using .37 ppd, 2024 are calculated using .39 ppd. 2025 is calculated using .41, 2026 and the remainder of the planning period is calculated using .43 ppd.

**Ohio EPA Commercial Data:** Ohio EPA surveys large commercial business which operate in many Ohio communities. They are often call "big box stores" and include recognizable businesses like Walmart, Kroger, and Lowes. OEPA's efforts assist the Districts, because many of these businesses manage recycling through their own supply chain instead of relying on local haulers. Local store management may not have easy access to the recycling data. Before OEPA began the statewide survey, it was often difficult to get this information from the local store. Although the amount reported varies from year to year primarily because the businesses that provide responses are not always the same. Even so, the amount reported was reasonably consistent in the period from 2014 to 2018. The projection for 2019, and for the remainder of the planning period is the amount reported in 2018. The amount is a constant and is not based on pounds per person per day.

**Curbside Recycling Services-Village of Versailles:** The Village operates its own curbside collection program which includes residential housing and some commercial businesses that choose to participate. The average amount collected has been .05 ppd. The Village program is a mature program, and it is likely that the per person amount collected will remain stable. .05 ppd is used to project the amount of recovery during the planning period.

**Composting Facilities:** Reported yard waste composting increased substantially between 2014 and 2018. The amount will vary from year to year depending on the weather and other factors. There has been an increase in reported compost from 2014 through 2018. The most likely explanation for the growth is the fact that the two private yard waste composting facilities have expanded their composting capabilities during this time. The average pounds per person per



day adjusted by eliminating the lowest and highest year is .04 and is used in making the future projections.

**Other Food and Yard Waste Activities:** Food composting is included in the OEPA composting facilities report. In 2018, 144 tons of food was reported as diverted from disposal by composting. The amount reported has increased from zero in 2014 to 114 tons in 2018 and 158 tons in 2019. The increase is probably due to expanded food recycling programs in one or both of the two largest super-markets in the District. The amount of food waste projected for 2020 is the same as 2019 and will remain the same over the planning period. Even though an increase is not projected, the District will work on increasing the amount of food composted.

Several villages in the District collect leaves in the autumn and spread them on agricultural land to be plowed into the soil. The District asks villages and townships to report information on the amounts collected and the method of collection to calculate the amount of material diverted by these methods. The District believes that the Villages will continue these programs because it is a convenience to residents and cuts down on less desirable methods of handling autumn leaves like illegal burning.

In the past several villages reported that did not report in 2018 and 2019 and the total reportable diversion was higher in previous years. However, the District realizes that reporting is viewed as an extra burden and as such is sporadic. Therefore, the amount during the planning period is projected to be the same as in the 2019.

**Scrap Tires reported to OEPA:** Scrap tires collection data is reported to Ohio EPA by registered scrap tire haulers and processors. The average amount reported for the years 2014 through 2018 is .06 ppd. The adjusted average eliminating the lowest and highest year is also .06 ppd. Tire recovery for 2019 is the actual amount reported. 2020 on is projected using .006 as a constant amount throughout the planning period assuming that the number of vehicles per household and the rate at which tires need to be replaced will stay about the same. Note that the total amount projected decreases as the projected district population decreases.

**Electronics and Appliance Recycling Day:** This event is held in conjunction with a local scrap yard which collects and recycles these materials year around. However, as of now the only reported and verified weights of material collected by this scrap yard and made available to the District come in conjunction with this event. The District does not expect the amount of reportable material managed by this event to grow. The annual events over the years seem to have reduced the back log of stored, obsolete items. As more appliance and electronic retailers in the District and out of the District have publicly available free programs to accept electronics, the amount that is delivered to these events will probably stay about the same or decrease. The amount collected in 2019 will be used as the projection for the remainder of the planning period.

**Household Hazardous Waste Event:** The District holds a household hazardous waste event annually to allow residents an opportunity to safely recycle or dispose of materials that are

classified as household hazardous waste. The amount of material handled by the event has stayed about the same. The District hopes that the amount collected will dwindle over time as people learn to buy less, use what they buy, and safely dispose of items like latex paint, which is not really hazardous when dried or treated appropriately, instead of bringing materials to a collection event. The amount for 2020 and the remainder of the planning period is projected to be the same as the reference year.

**Paper Shredding Day:** The district works with local sponsors to provide an opportunity for the public to safely recycle paper documents that may contain information that should be kept confidential. The average amount collected in 2014 through 2018 was .01 ppd. There is no evidence that participation and the weight of materials delivered will change substantially. Future recovery credited to this event is projected using .01 as a constant each year of the planning period.

**Plastic bottle cap collection:** Participation in this program has been close to overwhelming. Public participation has exceeded expectations. As of 2020, the District is continuing to operate the program, but collecting, sorting, and delivering the caps to the processor is labor intensive. The amount projected for 2020 through 2021 is the same as the reported amount in 2019. The District will continue to evaluate the program. Because the program's future is uncertain, projections are not included for 2022 and beyond.

**Household battery collection:** The District sponsors an ongoing dry-cell battery recycling program. Collection boxes are available at more than 25 locations around the District. The program is offered to discourage unsafe disposal of the batteries. The District will maintain the program until there are adequate recycling opportunities offered by private businesses. The amount collected historically has been .5 tons or less so that when rounded the result is "0". However, in 2019 the District reported sending 3.42 ton of dry cells for recycling. Because the District plans to continue the program until there are better private sector opportunities to recycled household dry cells, the District will project the amount to be recycled as 3 tons per year for the first five years of the planning period. The District will continue to evaluate the need for this program and the feasibility of continued funding for the program.