

APPENDIX F Industrial Waste Reduction and Recycling Data

A. Reference Year Recovery Data

This Appendix section presents the waste reduction and recycling data for the industrial sector in the 2018 reference year. There were two methods used to compile this data. The District sends out an industrial waste reduction and recycling survey each year to all industries with at least 5 employees in the District. The industries are asked to report all recycling and new waste reduction efforts and to identify the recycler that received the material. The receiving recycler information is required to eliminate double counting. In the past, the results were organized by SIC (standard industrial codes.) The District has switched to using NAICS industry codes. For this plan, the SIC codes were converted to NAICS for reporting 2018 industrial recycling data.

Until 2016, District sent surveys to scrap yards and brokers who had been identified in previous industrial surveys as receiving scrap from the District. However, there were very few responses, and after double counting was eliminated, there was little or no usable data. As of 2016, the only data source used in addition to the industrial surveys is the industrial recycling reported by Rumpke MRF's. The method used to avoid double counting of this material will be explained following Table F-2.

An historic analysis of the industrial sector's recycling is included in this Appendix. The recycling data from 2014 through 2018 is used as a basis for the planning period projections that are included in this section.

Table F-1: Industrial Survey Results in the Reference Year, 2018

| NAICS | Glass | Ferrous Metals | Non-Ferrous Metals | Corrugated Cardboard | All Other Paper | Plastics | Wood | Rubber | Commingled Recyclables (Mixed) | |
|-------------------------|----------|----------------|--------------------|----------------------|-----------------|------------|--------------|------------|--------------------------------|---------------|
| 23 | | 13 | 3 | 0 | 0 | | | | 48 | |
| 31 | | | | 42 | | | | | | |
| 32 | 0 | 187 | 26 | 324 | 14 | 796 | 493 | 204 | 1 | |
| 33 | | 6,226 | 1,003 | 1,936 | 140 | 30 | 1,519 | | 17 | |
| Unadjusted Total | 0 | 6,426 | 1,032 | 2,302 | 154 | 826 | 2,012 | 204 | 66 | 13,022 |
| Adjustments | | | | | | | | | 0 | |
| Adjusted Total | 0 | 6,426 | 1,032 | 2,302 | 154 | 826 | 2,012 | 204 | 66 | 13,022 |

Source: Data collected by written surveys with phone follow-up to clarify unclear items for the District’s 2018 annual district report. Only material categories for which material was reported are included in this table.

Calculation: The amounts shown in the NAICS code categories are the total of material reported by one or more industries that are in the code category.

Assumptions: Blank cells mean that no material was reported as being recycled, A zero “0” in a cell means that less than .5 ton was reported so that when rounded the result is 0. No adjustments were required for this table. Several industries reported Corrugated cardboard recycled by Rumpke MRF. The industry is credited with the full amount and the adjustment (-165 tons) is made in Table F-2.

Note: 204 tons of rubber and 5 tons of wood recycled was not reported in the 2018 Industrial Recycling ADR data. The District decided that the rubber and wood generated by a tire retreading facility should have been reported as industrial material and not as commercial. Corrections were made to subtract the material from 2018 reported res/com recycling and to add the material to industrial recycling.

North American Industry Classification System (NAICS) codes for industries providing the data reported in Table F-1.

| | |
|-----------|--|
| 23 | Construction |
| 31 | Food manufacturing |
| 32 | Wood product manufacturing, printing, chemical manufacturing, plastic resins, plastic products, tire retreading, machine shops |
| 33 | Appliance manufacture, motor vehicle parts, farm machinery manufacture, dental and hospital equipment. |

F-2 2018 Data from Other Recycling Facilities

| Program and/or Source of Materials/Data | Corrugated Cardboard | Total |
|---|----------------------|--------------|
| Buybacks | | |
| None | | |
| Scrap Yards | | |
| No reported industrial material in 2018 | | |
| Brokers | | |
| None reported 2018 | | |
| Processors/MRF's | | |
| Rumpke Recycling - Dayton-Industrial Material | 1,838 | 1,838 |
| Unadjusted Totals | 1,838 | 1,838 |
| Adjustments | -165 | -165 |
| Adjusted Totals | 1,673 | 1,673 |

No survey results were reported to the District from facilities classified as Buybacks, Scrap Yards or Brokers. Corrugated Cardboard was the only type of material reported by Rumpke Recycling from an industrial source.

Source(s) of Information: The data in this table was reported to Ohio EPA and published by OEPA in the Ohio Material Recovery Facilities and Commercial Recycling – 2018 report

Sample Calculations: The only calculation is simple subtraction to arrive at the adjusted total. $1,838 - 165 = 1,673$ The adjustment was required to eliminate double counting of cardboard reported by an industry included in Table 1 and also included in the amount reported by the Rumpke MRF.

Table: F-3 Other Recycling Programs/Other Sources of Data is omitted.

No other programs or information sources were responsible for measurable industrial waste recycling or reduction.

Table F-4 Industrial Material Recovered in Reference Year, 2018

| Material | Quantity (tons) |
|--------------------------------|-----------------|
| Food | 0 |
| Glass | 0 |
| Ferrous Metals | 6,426 |
| Non-Ferrous Metals | 1,032 |
| Corrugated Cardboard | 3,975 |
| All Other Paper | 154 |
| Plastics | 826 |
| Wood | 2,012 |
| Rubber | 204 |
| Commingled Recyclables (Mixed) | 66 |
| Total | 14,695 |

Source: Data collected by written surveys with phone follow-up to clarify unclear items for the District’s 2018 annual district report (Table F-1) plus the data reported to Ohio EPA and published by OEPA in the Ohio Material Recovery Facilities and Commercial Recycling – 2018 report (Table F-2)

Calculations: The content of this table is the sum by material type of the amounts reported on Table F-1 and F-2.

Table F-5 Quantities Recovered by Program/Source is omitted.

No District programs were responsible for measurable industrial waste recycling or reduction. Although the District has assisted industries seeking markets for specific materials and has assisted industries in applying for market development grants, no specific action or program is directly connected to a specific amount of recovered material. All of the reported recycling data was reported by industries in survey responses or by Rumpke in material recovery facility reports.

B. Historical Recovery

Table F-6 Historical Industrial Recovery by Source

| Year | Industrial survey | Data from other recycling facilities | Totals |
|------|-------------------|--------------------------------------|--------|
| 2014 | 16,904 | 403 | 17,307 |
| 2015 | 17,111 | 69 | 17,180 |
| 2016 | 13,882 | 1,852 | 15,734 |
| 2017 | 12,409 | 1,704 | 14,113 |
| 2018 | 13,022 | 1,673 | 14,696 |

Source: The information in Table F-6 Historical Industrial Recovery by Program/Source is from the data collected for the District’s annual district reports. The amount reported above for 2018 varies from the amount reported in the 2018 ADR that was previously submitted to OEPA. We reviewed the data and discovered 2 errors. 204 tons of rubber and 5 tons of wood which were credited to commercial recycling should have been reported as industrial. The adjustment for double counting of cardboard was overstated by 168 tons. These errors were corrected to arrive at the totals reported here.

The data from “other recycling facilities” in 2014 and 2015 was data from private scrap yards that received material from industries in the District. Double counting was eliminated through subtracting material reported on an industrial survey from the amount reported by the scrap yard that received the material. that was sent to that scrap yard. The “Data from Other Recycling Facilities” listed for 2016, 2017, and 2018 is from Rumpke MRF’s. To avoid double counting, the total was adjusted by subtracting the material reported by industry as collected by Rumpke from Rumpke’s reported total.

Tables F-6a1 to F-6a3 are all derived from Table F-6 and demonstrate several tools that can be used to analyze the historical data.

Table F-6a1 Annual Percentage Change in Tons Recovered

| Year | Industrial survey | Data from other recycling facilities |
|------|-------------------|--------------------------------------|
| 2014 | | |
| 2015 | 1% | -83% |
| 2016 | -19% | 2584% |
| 2017 | -11% | -8% |
| 2018 | 5% | -100% |

Calculation: (2015 tons-2014 tons) divided by 2014 tons = percent change
 From Table F-6 (17,307-17,180)/17,307=.013 expressed a percent and rounded is 1%

Table F-6a2 Average Annual Percentage Change in Tons Recovered

| Ind. survey | Other recycling facilities | Total change |
|-------------|----------------------------|--------------|
| -6% | 623% | -4% |

Table F-6a3 Tonnage Change/Year

| Year | Ind. survey | Other recycling facilities | Total change |
|------|-------------|----------------------------|--------------|
| 2014 | | | |
| 2015 | +207 | -334 | -127 |
| 2016 | -3,229 | +1,783 | -1,446 |
| 2017 | -1,473 | -148 | -1,621 |
| 2018 | +613 | -31 | +583 |

Table F-6a4 Average Tons of Material Over 5 Years

| Ind. survey | Other recycling facilities | Total |
|-------------|----------------------------|--------|
| 14,666 | 1,140 | 15,806 |

C. Industrial Recovery Projections

Table: F-7 Industrial Recovery Projections by Program/Source

| Year | Industrial survey | Data from other recycling facilities | Totals |
|-------------|-------------------|--------------------------------------|---------------|
| 2018 | 13,022 | 1,673 | 14,696 |
| 2019 | 12,786 | 1,414 | 14,200 |
| 2020 | 11,507 | 1,273 | 12,780 |
| 2021 | 12,786 | 1,414 | 14,200 |
| 2022 | 13,000 | 1,700 | 14,700 |
| 2023 | 13,000 | 1,700 | 14,700 |
| 2024 | 13,000 | 1,700 | 14,700 |
| 2025 | 13,000 | 1,700 | 14,700 |
| 2026 | 13,000 | 1,700 | 14,700 |
| 2027 | 13,000 | 1,700 | 14,700 |
| 2028 | 13,000 | 1,700 | 14,700 |
| 2029 | 13,000 | 1,700 | 14,700 |
| 2030 | 13,000 | 1,700 | 14,700 |
| 2031 | 13,000 | 1,700 | 14,700 |
| 2032 | 13,000 | 1,700 | 14,700 |
| 2033 | 13,000 | 1,700 | 14,700 |
| 2034 | 13,000 | 1,700 | 14,700 |
| 2035 | 13,000 | 1,700 | 14,700 |
| 2036 | 13,000 | 1,700 | 14,700 |

Source(s) of Information: The data in Table F-7 for the reference year, 2018, and for 2019 is from the District’s annual industrial recycling surveys and of OEPA reports of recycling processed at material recovery facilities, specifically MRF operated by Rumpke Waste and Recycling.

The 2020 projection is calculated at 90% of the actual amounts reported in 2019. According to data published by the Ohio Manufacturers Association, the unemployment rate for Darke County rose from less than 3% in May 2019 to more than 11% in May 2020. Although there is not a reason given for the increased unemployment, it is reasonable to believe that most of this change is due to Covid-19. The 10% decrease connects the decrease in employment to a drop in production resulting in less waste generation and waste recovery. The projection for 2021 uses the amount recycled in 2019. As the economy recovers and production amps up, we expect the amount of waste generation and waste recovery will go back up. By 2022, it is likely that waste recovery will be back to about the same level as in 2018.

The District is projecting recovery to stay at the 2022 level for the entire planning period. The primary reason is that the industries in the District are well established and have done an excellent job in reducing waste and in diverting materials from disposal through recycling programs. The amount of recycling has gone down from historic highs, but the percent of total industrial waste generation that is recycled continues to be high. In reviewing the industries that have responded to surveys over the years, at least two plants that recycled significant amounts of material in the past have closed. Also, several manufacturers initiated waste reduction programs, like switching to reusable shipping containers. The waste reduction amounts are only countable in the year they are initiated.

Unless new manufacturers open or existing manufacturers make significant changes to increase or decrease production, there is no reason to expect waste disposal or recycling will change significantly.