



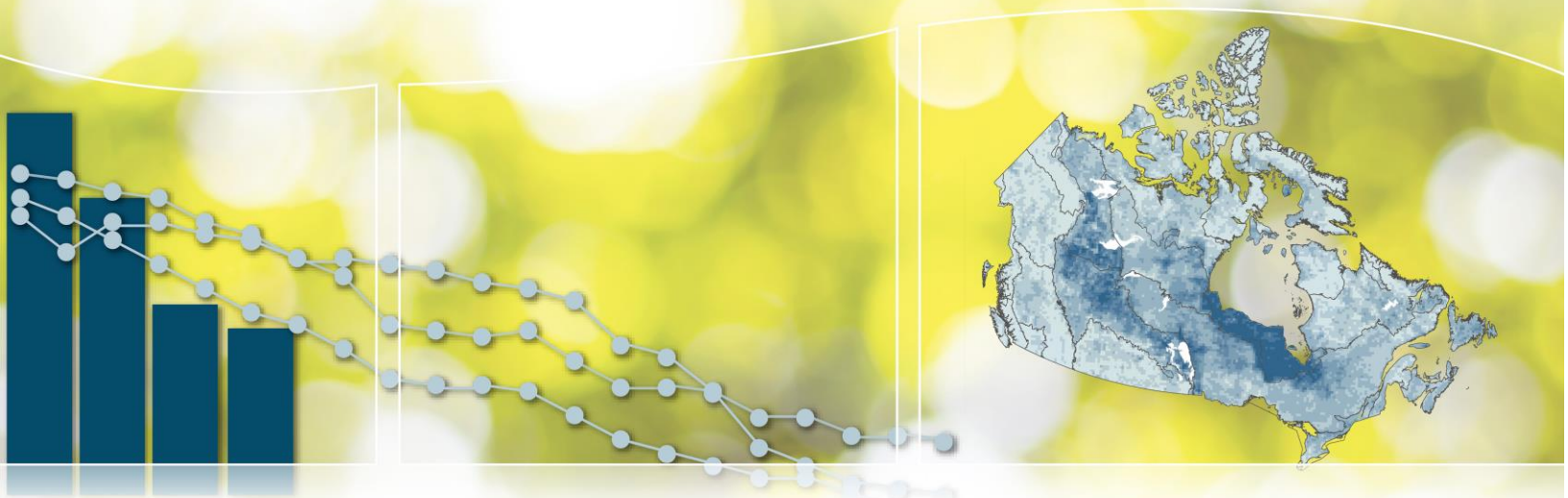
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# Canadian Environmental Sustainability Indicators

## Solid waste diversion and disposal



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# Canadian Environmental Sustainability Indicators

## Solid waste diversion and disposal

December 2018

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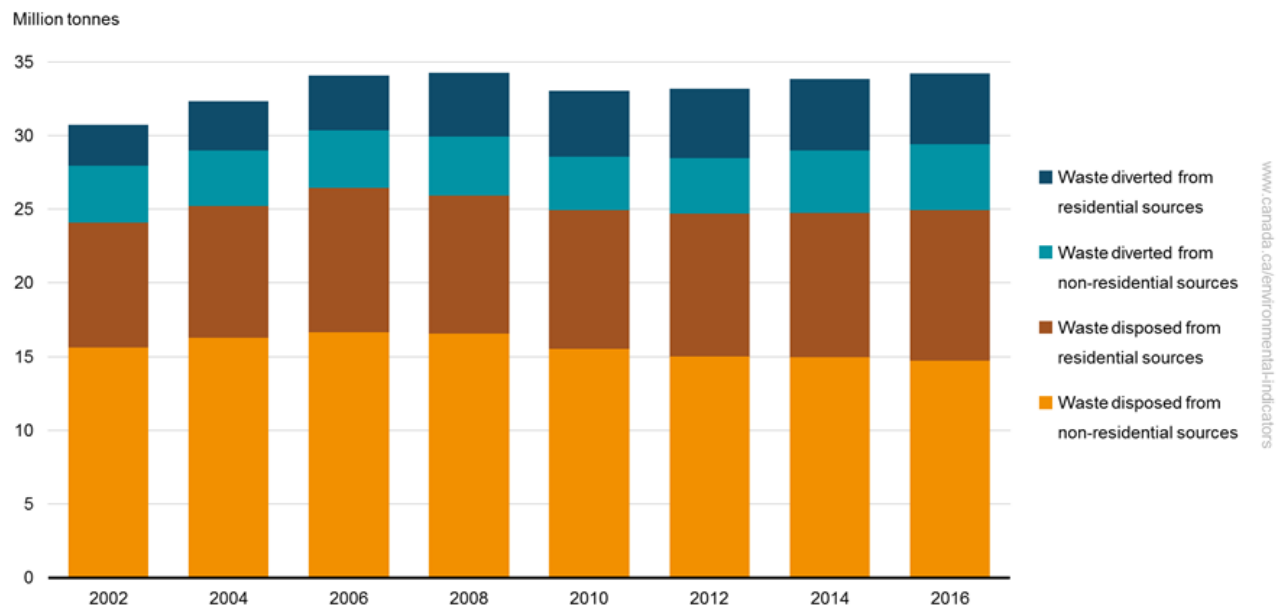
## Solid waste diversion and disposal

Most garbage collected for disposal ends up in landfills and a small amount is incinerated. This can lead to air emissions, land disturbance or water pollution. The extraction and processing of new resources needed to replace those discarded as waste leads to more pollution. Diverting waste by recycling and composting can help reduce the impact of solid waste on the environment.<sup>1</sup>

### Key results

- From 2002 to 2016, the total amount of solid waste<sup>2</sup> collected in Canada increased by 3.5 million tonnes (or 11%)
  - The amount of waste disposed in landfills or incinerated increased by 0.9 million tonnes (or 4%) to reach 24.9 million tonnes in 2016
  - The amount of waste diverted grew by 2.6 million tonnes (or 39%) to reach 9.3 million tonnes in 2016
- In 2016, the non-residential sector was responsible for 59% of disposed waste and 48% of diverted waste

**Figure 1. Solid waste diversion and disposal, Canada, 2002 to 2016**



[Data for Figure 1](#)

**Source:** Statistics Canada (2018) [Table 38-10-0032-01. Disposal of waste, by source](#). Statistics Canada (2018) [Table 38-10-0033-01. Materials diverted, by source](#).

<sup>1</sup> For more information see [Municipal solid waste management](#).

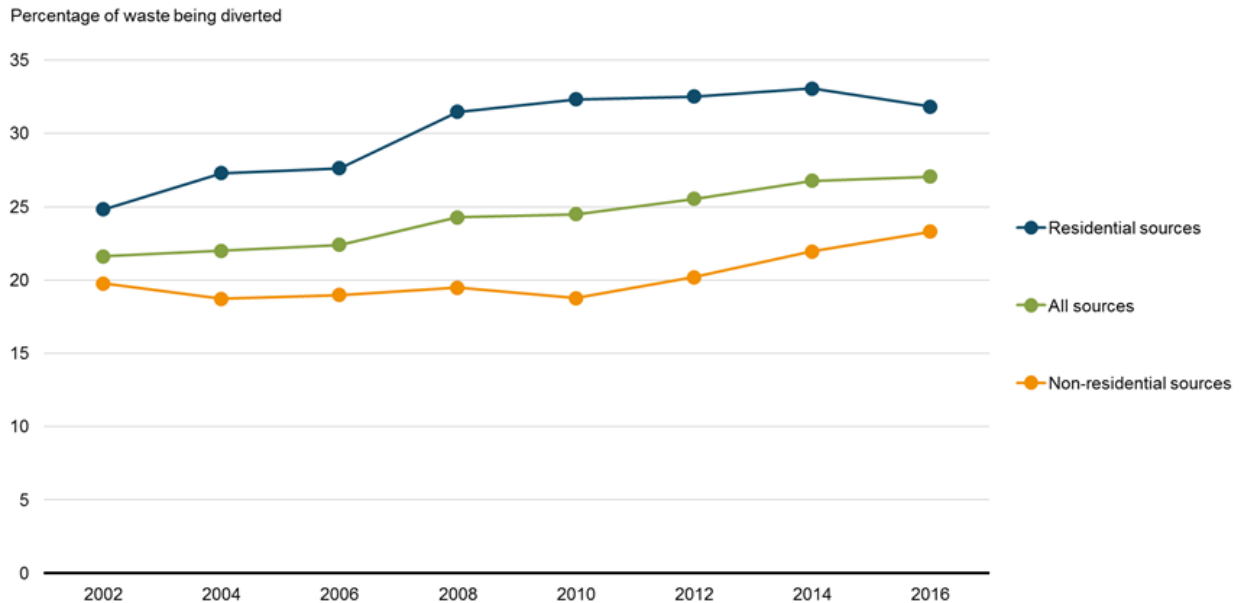
<sup>2</sup> For more details about what constitutes solid waste in the context of this indicator, please refer to the [Data sources and methods](#).

Solid waste refers to recyclables, organic materials and garbage generated by homes, businesses and institutions.

In 2016, 27% of solid waste was diverted from disposal, up from 22% in 2002.

- The share of waste being diverted from residential sources increased from 25% to 32%
- The share of waste being diverted from non-residential sources increased from 20% to 23%

**Figure 2. Solid waste diversion rate by source, Canada, 2002 to 2016**



[Data for Figure 2](#)

**Source:** Statistics Canada (2018) [Table 38-10-0032-01. Disposal of waste, by source](#). Statistics Canada (2018) [Table 38-10-0033-01. Materials diverted, by source](#).

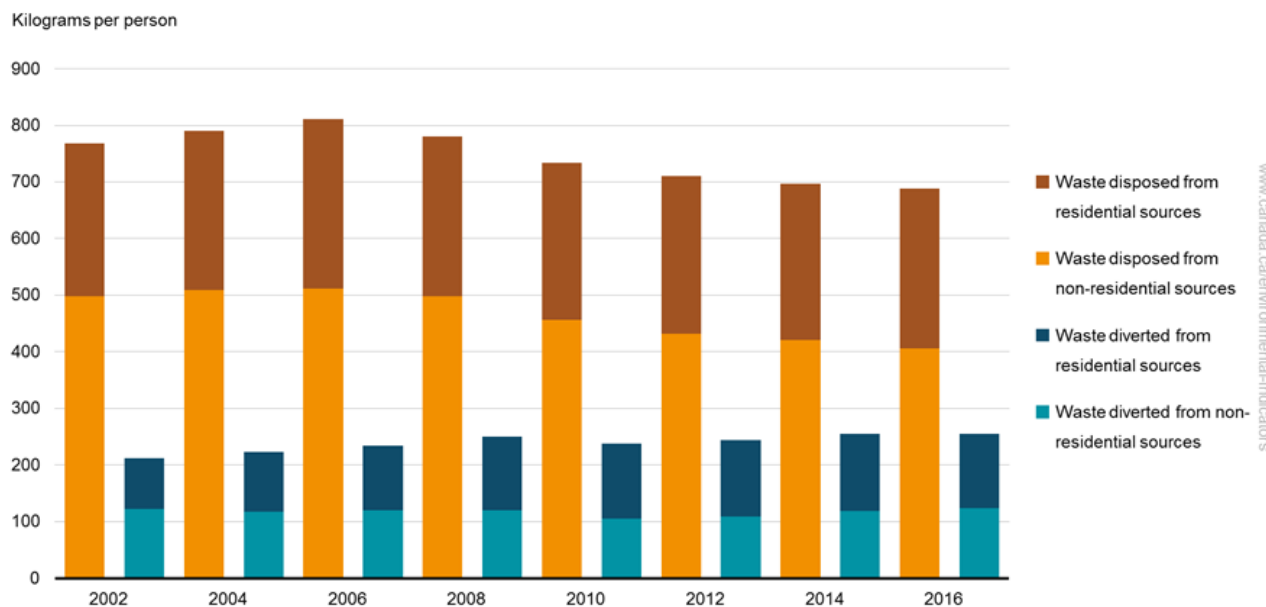
Between 2002 and 2016, solid waste disposal from residential sources grew by 1.8 million tonnes, while the waste diverted increased by 2 million tonnes. Disposal from non-residential sources shrank by 0.9 million tonnes over the same period, while diversion increased by 0.6 million tonnes.

## Solid waste per person

### Key results

- Total solid waste disposal per person has decreased from 768 to 688 kilograms between 2002 and 2016
- Diversion of waste per person has increased over the same period from 212 to 255 kilograms, an increase of about 20%

**Figure 3. Solid waste diversion and disposal per person, Canada, 2002 to 2016**



[Data for Figure 3](#)

**Source:** Statistics Canada (2018) [Table 38-10-0032-01. Disposal of waste, by source](#). Statistics Canada (2018) [Table 38-10-0033-01. Materials diverted, by source](#).

From 2002 to 2016, waste disposal per person from residential sources increased from 269 to 282 kilograms while disposal per person from non-residential sources declined from 499 to 406 kilograms.

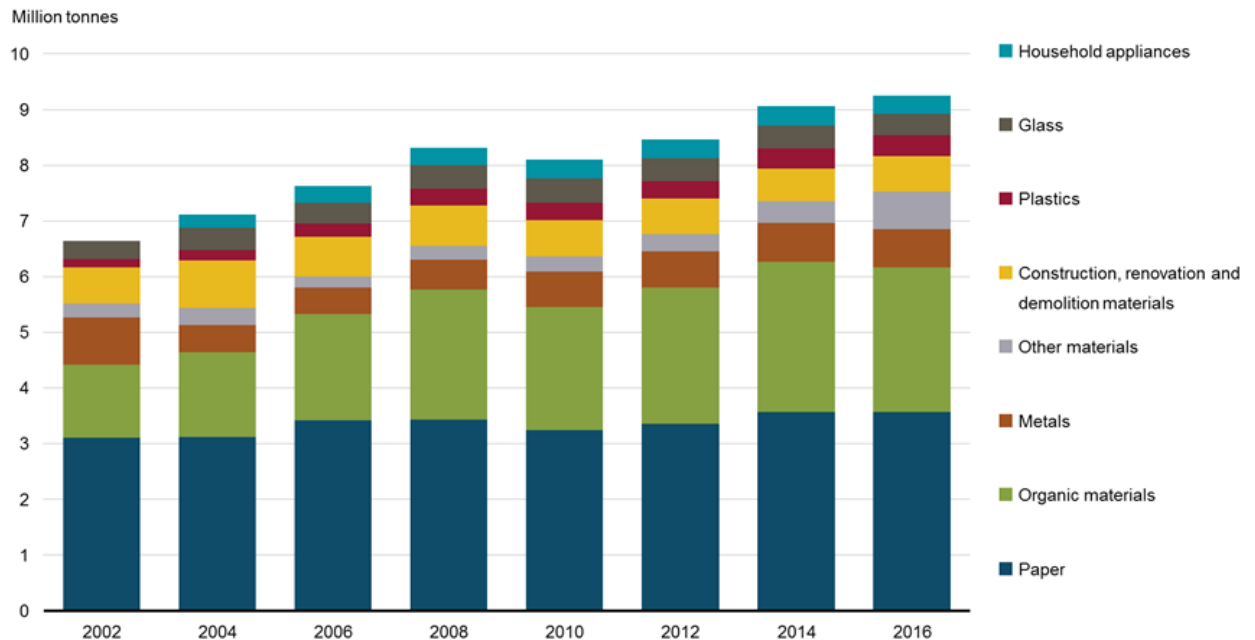
Waste diversion per person from residential sources increased steadily between 2002 and 2014, but dropped in 2016. Waste diversion per person from non-residential sources went up and down over the period.

## Solid waste diversion by type of material

### Key results

- Between 2002 and 2016, solid waste diversion increased by 39% to 9.3 million tonnes
- In 2016, paper and organic materials accounted for 67% of total solid waste diverted (3.6 and 2.6 million tonnes, respectively)

**Figure 4. Solid waste diversion by type of material, Canada, 2002 to 2016**



[Data for Figure 4](#)

**Note:** Other materials include electronics, tires and other unclassified materials.

**Source:** Statistics Canada (2018) [Table 38-10-0034-01. Materials diverted, by type.](#)

Diversion of plastics almost tripled between 2002 and 2016 but remains extremely small at less than 5% of all solid waste diversion. Organic materials diversion doubled to reach 28% of diverted material, second to paper.

Diversion of metals and construction, renovation and demolition materials are the only types of materials that saw a decline during this period.



## About the indicator

### What the indicator measures

This indicator reports on the total quantity and the quantity per person of non-hazardous solid waste diverted and disposed by municipal governments and businesses in the waste management industry, the diversion rate by source (residential and non-residential) and the types of materials diverted.

### Why this indicator is important

Tracking the trends in solid waste diversion and disposal helps us to understand how waste management and recycling programs are working. It also provides a measure of how efficiently Canadians use their resources, which has implications for the natural environment. For example, when we recycle materials we reduce overall energy use and greenhouse gas emissions from their production and use.<sup>3</sup>

### Related indicators

The [Greenhouse gas emissions](#) indicators report trends in anthropogenic (human-made) greenhouse gas emissions. Emissions by economic sector, including waste, are presented.

The [Air pollutant emissions](#) indicators track emissions from human activities of 6 key air pollutants: sulphur oxides, nitrogen oxides, volatile organic compounds, ammonia, carbon monoxide and fine particulate matter (PM<sub>2.5</sub>). Black carbon, which is a component of PM<sub>2.5</sub>, is also reported. Emissions by sources, including incineration and waste, are also presented.

The [Emissions of harmful substances to air](#) indicators track human-related emissions to air of 3 toxic substances, namely mercury, lead and cadmium, and their compounds. For each toxic substance, emissions to air are provided at the national, regional (provincial and territorial) and facility level and by source (including incineration and waste). Global emissions to air are also provided for mercury.

The [Releases of harmful substances to water](#) indicators track human-related releases to water of 3 toxic substances, namely mercury, lead and cadmium, and their compounds. For each toxic substance, releases to water are provided at the national, regional (provincial and territorial) and facility level and by source (including sewage treatment and waste management).

## Data sources and methods

### Data sources

The data used for the Solid waste diversion and disposal indicator comes from 2 Statistics Canada surveys; both are carried out every 2 years. The most recent surveys were conducted in 2016 and the results were released in 2018.

- [Waste Management Industry Survey: Government Sector](#)
- [Waste Management Industry Survey: Business Sector](#)

Population data also come from Statistics Canada.

- [Statistics Canada \(2018\) Table 17-10-005-01. Population estimates on July 1st, by age and sex](#)

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<sup>3</sup> Turnerlan DA, Williams D, Kemp S (2015) [Greenhouse gas emission factors for recycling of source-segregated waste materials](#). Accessed on October 10, 2018.

### **More information**

For this indicator, waste includes non-hazardous solid wastes from residential and non-residential (industrial, commercial and institutional) sources disposed of or diverted through municipal governments and the waste management industry.

Solid waste refers to recyclables, organic materials and garbage generated by homes, businesses and institutions.

Disposed waste includes waste materials sent to landfills, to incinerators or to facilities that generate energy from waste.

Diverted waste includes waste materials that go through any physical transformation, such as composting, separation or sorting in preparation for recycling or reuse.

### **Methods**

The indicator represents the weight of all types of material diverted and disposed from residential and non-residential sources. The diversion rate is the percentage of waste diverted relative to the total waste disposed and diverted as reported to the 2 waste surveys.

Waste diverted and disposed per person was calculated by dividing the weight of all types of material by the total population.

### **Caveats and limitations**

The survey values were imputed when values were missing or when the respondent did not complete a questionnaire even after extensive follow-up.

The indicator excludes material that bypasses the waste management stream captured by the surveys. This includes materials not processed in a material recycling facility, such as material recycled directly by retailers, or the reuse of bottles handled through a bottle-return program.

The data are for waste collected, and total waste generated is not tracked. For example, littering, dumping or storing waste is not accounted for.

Municipal and business waste collection operations must meet Statistics Canada's reporting thresholds in order to be covered by the municipal and business waste management surveys. As such, very small waste collection operations may not be covered.

## **Resources**

### **References**

Babooram A and Wang J (2007) [Recycling in Canada](#). Statistics Canada. Retrieved on October 5, 2018.

Statistics Canada (2011) [North American Industry Classification System \(NAICS\) Canada 2012](#). Retrieved on October 5, 2018.

Statistics Canada (2012) [Human Activity and the Environment, Waste management in Canada](#). Retrieved on October 5, 2018.

Statistics Canada (2018) [Waste management](#). Retrieved on October 5, 2018.

### **Related information**

[Waste](#)

[Municipal solid waste management](#)

## Annex

### Annex A. Data tables for the figures presented in this document

**Table A.1. Data for Figure 1. Solid waste diversion and disposal, Canada, 2002 to 2016**

Year	Waste disposed from non-residential sources (million tonnes)	Waste disposed from residential sources (million tonnes)	Waste diverted from non-residential sources (million tonnes)	Waste diverted from residential sources (million tonnes)
2002	15.6	8.4	3.9	2.8
2004	16.3	9.0	3.7	3.4
2006	16.7	9.7	3.9	3.7
2008	16.6	9.4	4.0	4.3
2010	15.5	9.4	3.6	4.5
2012	15.0	9.7	3.8	4.7
2014	15.0	9.8	4.2	4.8
2016	14.7	10.2	4.5	4.8

Source: Statistics Canada (2018) [Table 38-10-0032-01. Disposal of waste, by source](#). Statistics Canada (2018) [Table 38-10-0033-01. Materials diverted, by source](#).

**Table A.2. Data for Figure 2. Solid waste diversion rate by source, Canada, 2002 to 2016**

Year	Residential sources (percentage of waste being diverted)	Non-residential sources (percentage of waste being diverted)	All sources (percentage of waste being diverted)
2002	24.8	19.8	21.6
2004	27.3	18.7	22.0
2006	27.6	19.0	22.4
2008	31.5	19.5	24.3
2010	32.3	18.8	24.5
2012	32.5	20.2	25.5
2014	33.1	22.0	26.8
2016	31.8	23.3	27.1

Source: Statistics Canada (2018) [Table 38-10-0032-01. Disposal of waste, by source](#). Statistics Canada (2018) [Table 38-10-0033-01. Materials diverted, by source](#).

**Table A.3. Data for Figure 3. Solid waste diversion and disposal per person, Canada, 2002 to 2016**

Year	Waste disposed from non-residential sources (kilograms per person)	Waste disposed from residential sources (kilograms per person)	Total waste disposed (kilograms per person)	Waste diverted from non-residential sources (kilograms per person)	Waste diverted from residential sources (kilograms per person)	Total waste diverted (kilograms per person)
2002	499	269	768	123	89	212
2004	509	281	790	117	105	223
2006	512	299	811	120	114	234
2008	498	282	780	121	129	250
2010	456	278	734	105	133	238
2012	432	279	710	109	134	244
2014	421	276	697	118	136	255
2016	406	282	688	123	132	255

**Source:** Statistics Canada (2018) [Table 38-10-0032-01. Disposal of waste, by source.](#) Statistics Canada (2018) [Table 38-10-0033-01. Materials diverted, by source.](#)

**Table A.4. Data for Figure 4. Solid waste diversion by type of material, Canada, 2002 to 2016**

Year	Paper (million tonnes)	Organic materials (million tonnes)	Metals (million tonnes)	Other materials (million tonnes)	Construction, renovation and demolition materials (million tonnes)	Plastics (million tonnes)	Glass (million tonnes)	Household appliances (million tonnes)
2002	3.1	1.3	0.9	0.2	0.6	0.1	0.3	n/a
2004	3.1	1.5	0.5	0.3	0.8	0.2	0.4	0.2
2006	3.4	1.9	0.5	0.2	0.7	0.2	0.4	0.3
2008	3.4	2.3	0.5	0.3	0.7	0.3	0.4	0.3
2010	3.2	2.2	0.6	0.3	0.7	0.3	0.4	0.3
2012	3.4	2.5	0.6	0.3	0.6	0.3	0.4	0.3
2014	3.6	2.7	0.7	0.4	0.6	0.4	0.4	0.3
2016	3.6	2.6	0.7	0.7	0.6	0.4	0.4	0.3

**Note:** n/a = not available. Other materials include electronics, tires and other unclassified materials.

**Source:** Statistics Canada (2018) [Table 38-10-0034-01. Materials diverted, by type.](#)

Additional information can be obtained at:

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