DAKOTA COUNTY, MINNESOTA

WASTE AUDITS FOR THIRTEEN MUNICIPAL BUILDINGS

PROJECT REPORT

May 9, 2017
(rev. June 15, 2017)

MSW CONSULTANTS

MSW CONSULTANTS

11875 High Tech Avenue, Suite 150, Orlando, FL (800) 679-9220

www.mswconsultants.com

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TABLE OF CONTENTS

LIST OF APPENDICES – *IN ALPHABETICAL ORDER*

TABLE OF CONTENTS

List of Figures

List of Tables

DAKOTA COUNTY MUNICIPAL BUILDING WASTE SORT

1. PROJECT OVERVIEW

Dakota County (County) contracted with MSW Consultants to conduct waste sorts on waste material streams at municipal buildings for thirteen municipalities and townships within the county. The County identified the facilities and MSW Consultants staff mobilized and completed the sorts in February, 2017.

Most of the facilities were city halls/town halls, with the exception of two community centers. All of the facilities separate Trash and Recycling for collection by private haulers, although a few of the facilities also separate Organics. Per understandings from staff, the material samples were based on two days' worth of accumulation, except for special circumstances at two locations where different accumulations were used. Table 1 below identifies participating facilities, the date the sort was completed at the facility and which waste streams were characterized.

Table 1 Facilities Represented in the Dakota County Municipal Building Waste Sort *

Municipal Building	Date Sorted	Trash Sorted	Recycling Sorted	Organics Sorted
Lakeville City Hall	2/6/17	Yes	Yes	No
Apple Valley City Hall	2/7/17	Yes	Yes	Yes
Eagan City Hall	2/8/17	Yes	Yes	Yes
Farmington City Hall	2/9/17	Yes	Yes	No
Rosemount City Hall	2/9/17	Yes	Yes	No
South St. Paul City Hall	2/10/17	Yes	Yes	No
West St. Paul City Hall	2/10/17	Yes	Yes	No
Eagan Community Center	2/11/17	Yes	Yes	Yes
Inver Grove Heights City Hall	2/13/17	Yes	Yes	No
Mendota Heights City Hall	2/13/17	Yes	Yes	No
Empire Township Town Hall	2/14/17	Yes	Yes	No
Hastings City Hall	2/15/17	Yes	Yes	No
Burnsville Ames Center	2/21/17	Yes	Yes	No
Total	**13**	**13**	**13**	**3**

* In *Date Sorted* Order

Results by facility are presented below. Individual facility characterization results and key findings are presented as Appendices to this report. The results have been annualized according to the amount of material generated during the sort activity or by the current service levels where available.

Recycling Rate is used in this report to mean the percentage of all waste that is diverted through recycling. **Capture Rate**, sometimes called a "recovery rate" is the percentage of targeted materials that is actually recycled or "captured" through the available recycling infrastructure. The list of targeted recyclables was provided by the County.

Key observations from the project as a whole are as follows:

- Broadly, capture rates and recycling rates were higher than average given the currently available diversion opportunities. The majority of the locations sampled expressed interest in diverting additional materials.
- With a few exceptions, the recycling and organics streams sampled were relatively clean. Particular education and training needs that were apparent during the sorting activities are mentioned in the individual facility appendices.
- Most of the facilities not already separately collecting Organics are generating a fair amount of compostable items, mostly paper towels with some food scraps varying by location. To significantly increase diversion from most facilities, it will be necessary to add organics collection to the existing recycling program because there are limited opportunities to increase diversion through incremental improvement to the current programs.

2. AGGREGATE COMPOSITION OF DISPOSED WASTES

Figure 1 displays the aggregate estimated composition of wastes destined for disposal from the thirteen facilities. As is shown, approximately 64% of the waste was identified as either Recyclable or Compostable Organics.

Figure 1 Aggregate Composition of Disposed Wastes

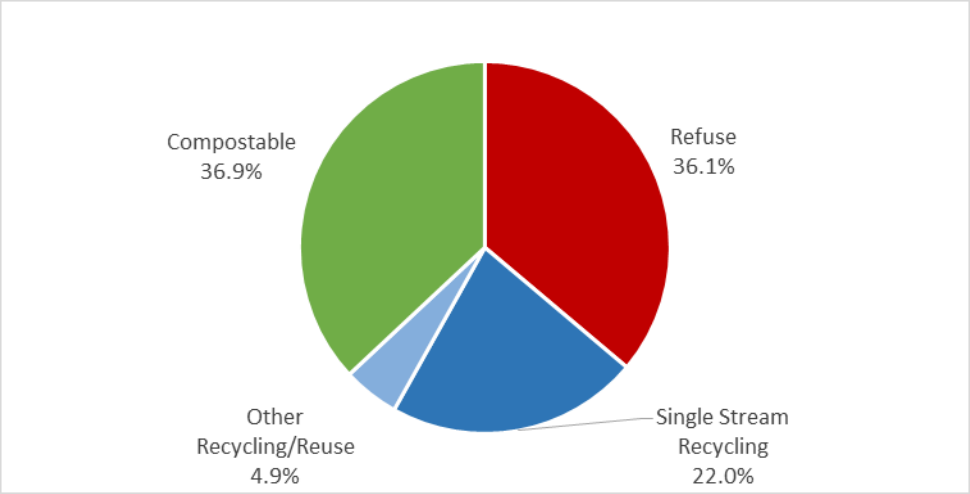


Table 2 represents the Top 5 most prevalent Recyclable or Compostable items identified in the Trash sorts. These represent materials to focus additional education and training efforts, program planning and additional collection of targeted materials. Food waste and compostable products, for example, may be worthy of additional collection programs in the municipal facilities.

Table 2 Top Five Divertible Materials in Trash

Category	%
Food Waste	18.1%
Compostable Products and Low Grade Paper	16.3%
Mixed Recyclable Paper	7.3%
Plastic Containers (Non-bottle)	6.2%
Reusable Items	4.8%

Exhibit 1 at the end of this section contains the detailed tabular summary of disposed wastes.

3. AGGREGATE COMPOSITION OF RECYCLABLES

Figure 2 below provides the aggregate composition of separately collected recyclables from the 13 facilities. As displayed, most recyclables are fiber. Just over 14 percent of the material being collected for Recycling at all thirteen facilities is not appropriate in the Recycling stream and constitute contamination.

Figure 2 Aggregate Composition of Recyclables

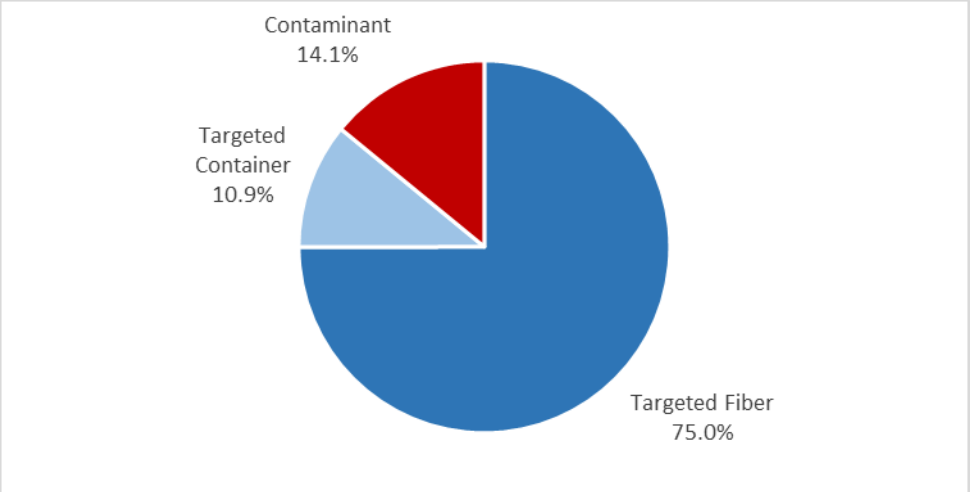


Exhibit 2 at the end of this section displays the results by material for each facility.

4. AGGREGATE COMPOSITION OF COMPOSTABLE ORGANICS

Organics are collected separately in three of the thirteen facilities where sorts were conducted, Apple Valley City Hall, Eagan City Hall and the Eagan Community Center. Staff members at many of the other facilities indicated they are working on logistics and considering implementing a program if enough materials were deemed compostable during the sort.

Figure 3 below provides the aggregate composition of collected Organics from these three facilities. As shown, the compostable material stream was found to have very little contamination, indicating that education efforts in these relatively new programs is very successful.

Figure 3 Aggregate Composition of Organic

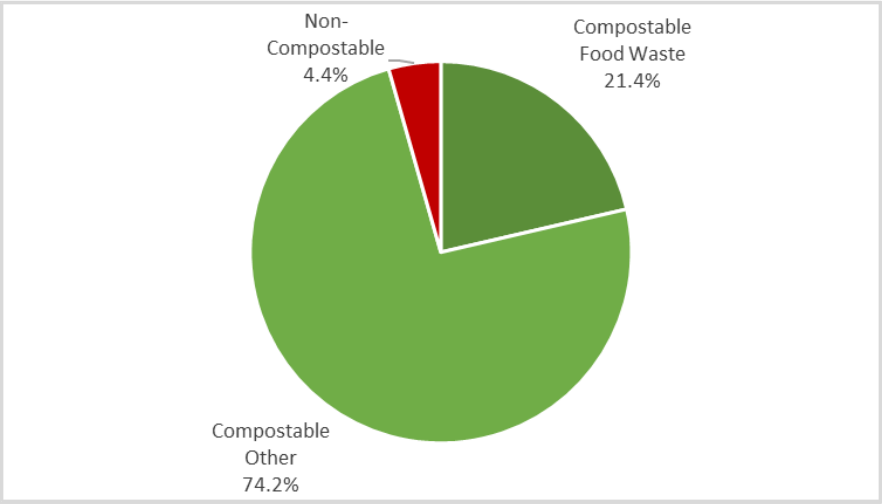


Exhibit 3 at the end of this section provides the Organics sort results by each facility.

5. AGGREGATE CAPTURE RATES AND RECYCLING RATE

In the aggregate, these 13 facilities recycled approximately 35 percent of their wastes by weight, and achieved an aggregate capture rate of 43 percent. The capture rate for traditional recyclables (fiber plus bottles/cans) was 61 percent, while the aggregate capture rate for compostables was only 13 percent, which is unsurprising given that most of the facilities do not have organics collection.

Figure 4 illustrates the range of capture rates for various materials. The totaled capture rates for "All Recyclables," "All Divertible Materials" and "All Compostables" are highlighted in red for reference. As shown, the facilities are doing a better job of capturing their OCC and mixed recyclable papers, and have the lowest capture rates for food, plastic non-bottle containers, and other compostable organics.

Figure 4 Aggregate Capture Rates

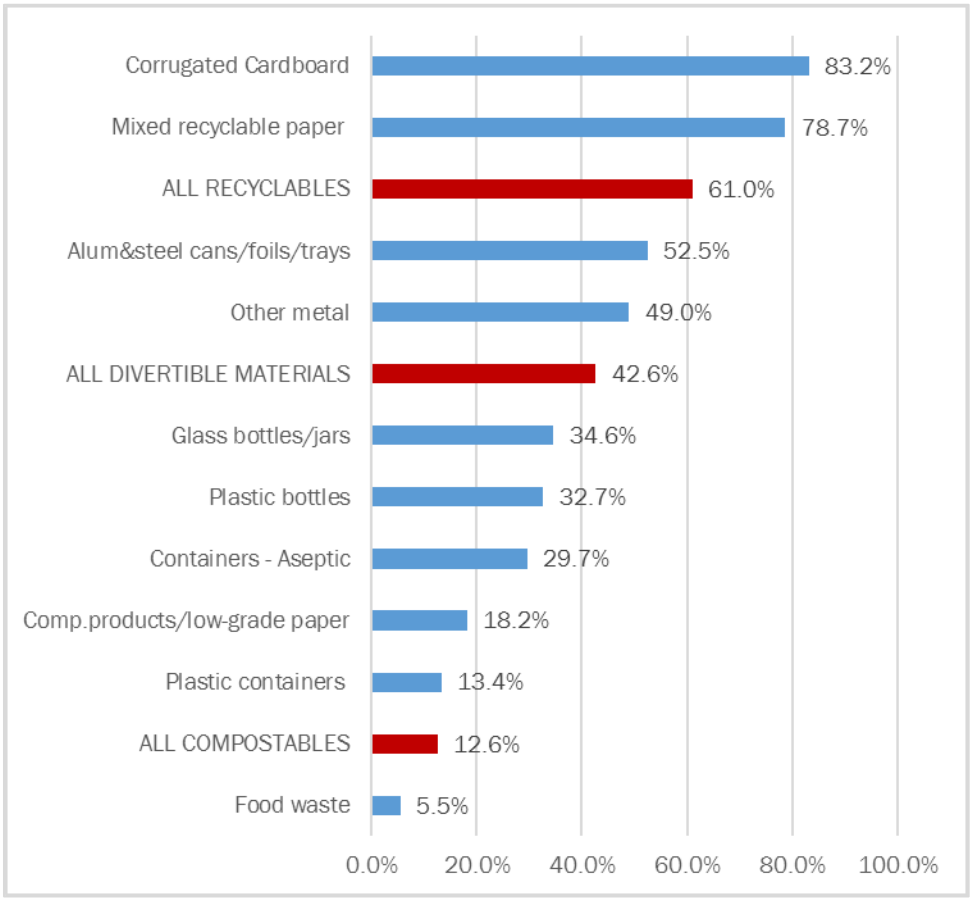


Exhibit 4 at the end of this section presents the aggregate capture rate calculations for all materials. Exhibit 5 at the end of this section presents recycling and organics figures for each location, including maximum potential diversion. The results, key findings and photos of each facility's waste sort are presented as Appendices to this report, appearing in alphabetical order.

Exhibit 1 -Dakota County 13 Facility Trash Characterization Summary

Group	Material Category	Lakeville City Hall	Apple Valley City Hall	Eagan City Hall	Farmington City Hall	Rosemount City Hall	South St. Paul City Hall	West St. Paul City Hall	Eagan Community Center	Inver Grove Heights City Hall	Mendota Heights City Hall	Empire Township City Hall	Hastings City Hall	Burnsville Ames Arena	TOTAL ALL SITES
Paper	Corrugated Cardboard	2.2%	1.1%	1.2%	0.6%	1.6%	1.4%	1.1%	0.0%	0.8%	2.0%	1.7%	0.0%	2.8%	1.5%
Paper	Mixed recyclable paper	10.2%	9.8%	6.7%	9.5%	27.6%	11.2%	2.1%	3.9%	23.9%	5.9%	5.7%	5.1%	4.1%	12.0%
Paper	Containers - Aseptic	0.0%	0.0%	0.7%	0.0%	0.2%	0.2%	0.1%	0.2%	0.3%	0.0%	1.7%	0.0%	0.0%	0.1%
Plastic	Plastic bottles	0.8%	0.6%	2.7%	1.1%	1.4%	1.8%	1.1%	9.9%	3.3%	0.1%	0.3%	0.7%	5.2%	2.1%
Plastic	Plastic containers	8.1%	7.6%	6.5%	3.5%	2.6%	1.4%	6.2%	19.0%	3.1%	6.0%	0.0%	3.9%	3.8%	3.6%
Other	Plastic film	0.8%	8.5%	7.7%	10.3%	5.3%	4.8%	5.3%	6.9%	9.5%	11.6%	22.0%	0.0%	9.0%	6.0%
Other	Expanded polystyrene	0.4%	0.8%	1.4%	1.1%	0.2%	0.5%	0.4%	0.0%	0.3%	1.0%	0.0%	0.4%	0.4%	0.5%
Glass	Glass bottles/jars	0.0%	0.8%	0.0%	0.0%	1.0%	0.0%	1.0%	0.0%	3.3%	0.0%	0.0%	0.0%	1.5%	0.7%
Metal	Alum/steel cans/alum foils/trays	1.3%	1.8%	3.5%	0.7%	1.1%	2.0%	0.6%	2.8%	2.1%	0.8%	0.0%	0.4%	0.7%	1.5%
Metal	Other metal	0.0%	0.0%	0.3%	0.0%	0.0%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Organics	Food waste	19.8%	24.6%	28.9%	28.5%	15.1%	12.3%	13.3%	0.0%	18.2%	32.3%	0.0%	12.2%	26.4%	17.0%
Organics	Compostable products/ low-grade paper	26.7%	17.5%	14.0%	31.1%	14.7%	11.7%	13.6%	14.5%	25.0%	31.8%	4.7%	14.8%	18.1%	15.7%
Organics	Yard waste/green waste	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
C&D	Wood Pallets/Clean Wood	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.1%
C&D	C&D debris	0.9%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	29.1%	48.5%	0.0%	2.8%
Other	Items illegal to throw away	6.1%	0.5%	0.5%	7.1%	0.0%	0.3%	1.4%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.7%
Other	Trash	8.2%	15.4%	15.7%	6.0%	18.2%	28.5%	16.8%	17.7%	5.5%	7.3%	34.8%	12.9%	6.6%	18.0%
Other	Liquids	0.0%	6.1%	7.0%	0.4%	1.2%	4.8%	1.5%	17.5%	3.4%	0.0%	0.0%	0.9%	19.6%	5.4%
Other	Reusable items	12.3%	5.0%	3.3%	0.0%	9.8%	4.6%	35.2%	7.6%	1.3%	1.1%	0.0%	0.1%	1.5%	8.0%
	TOTALS:	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
	TRASH Pounds Sorted:	**26.1**	**33.3**	**39.7**	**19.0**	**134.3**	**280.9**	**92.6**	**6.7**	**59.4**	**10.4**	**3.7**	**37.8**	**105.8**	**849.7**

Exhibit 2 -Dakota County 13 Facility Recycling Characterization Summary

Group	Material Category	Lakeville City Hall	Apple Valley City Hall	Eagan City Hall	Farmington City Hall	Rosemount City Hall	South St. Paul City Hall	West St. Paul City Hall	Eagan Community Center	Inver Grove Heights City Hall	Mendota Heights City Hall	Empire Township City Hall	Hastings City Hall	Burnsville Ames Arena	TOTAL ALL SITES
Paper	Corrugated Cardboard	7.7%	2.5%	4.0%	65.3%	8.8%	23.3%	6.9%	47.0%	7.3%	2.3%	11.4%	3.0%	35.9%	16.5%
Paper	Mixed recyclable paper	76.0%	61.1%	45.5%	31.9%	82.0%	62.8%	41.8%	7.1%	69.3%	90.3%	86.4%	91.0%	29.0%	64.4%
Paper	Containers - Aseptic	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	Plastic bottles	1.0%	18.1%	12.7%	1.3%	0.0%	1.5%	3.1%	0.0%	6.2%	1.0%	0.7%	1.2%	0.1%	2.3%
Plastic	Plastic containers	1.1%	2.1%	5.5%	0.1%	0.0%	0.4%	0.9%	10.1%	0.3%	0.6%	0.5%	0.3%	0.3%	0.9%
Other	Plastic film	1.8%	2.4%	3.0%	0.5%	0.2%	0.8%	2.5%	8.2%	2.1%	0.8%	0.0%	0.6%	2.6%	1.4%
Other	Expanded polystyrene	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%
Other	Items illegal to throw away	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.2%
Other	Trash	0.3%	3.1%	2.4%	0.0%	0.0%	5.4%	3.2%	21.0%	0.6%	0.4%	0.0%	0.4%	16.7%	3.2%
Other	Liquids	0.4%	1.7%	12.5%	0.0%	0.0%	2.4%	2.7%	1.8%	3.5%	0.0%	0.0%	1.5%	5.1%	1.7%
Other	Reusable items	6.1%	0.7%	1.5%	0.0%	8.9%	0.0%	20.2%	0.7%	0.5%	1.5%	1.0%	1.5%	0.6%	4.1%
Glass	Glass bottles/jars	2.3%	0.0%	3.0%	0.0%	0.0%	0.0%	1.7%	0.0%	3.4%	2.1%	0.0%	0.0%	0.0%	1.0%
Metal	Alum/steel cans/alum foils/trays	2.5%	8.1%	8.2%	1.0%	0.0%	3.2%	9.1%	1.4%	1.3%	0.5%	0.0%	0.1%	0.2%	2.2%
Metal	Other metal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.4%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.5%
Organics	Food waste	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.6%	0.1%	0.0%	0.2%	8.3%	0.9%
Organics	Compostable products/ low-grade paper	0.2%	0.2%	0.6%	0.0%	0.0%	0.1%	1.7%	0.7%	3.8%	0.2%	0.0%	0.2%	1.3%	0.7%
Organics	Yard waste/green waste	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C&D	Wood Pallets/Clean Wood	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C&D	C&D debris	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	TOTALS:	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
	RECYCLING Pounds Sorted:	**51.7**	**30.3**	**20.6**	**76.9**	**106.4**	**73.2**	**85.3**	**24.0**	**59.0**	**138.9**	**38.7**	**67.4**	**74.5**	**846.7**

Exhibit 3 Aggregate Organics Composition, All Facilities (Lbs)

Material Category	Stream	Apple Valley City Hall	Eagan City Hall	Eagan Community Center	Total (lbs)	Total (Pct)
Corrugated Cardboard	Recyclable	8	16	122	146	0.6%
Mixed recyclable paper	Recyclable	2	5	9	16	0.1%
Containers - Aseptic	Recyclable	0	0	0	0	0.0%
Plastic bottles	Recyclable	0	0	47	47	0.2%
Plastic containers	Recyclable	10	10	243	262	1.1%
Plastic film	Refuse	60	5	9	74	0.3%
Expanded polystyrene	Refuse	0	0	0	0	0.0%
Glass bottles/jars	Recyclable	0	0	0	0	0.0%
Alum&steel cans/foils/trays	Recyclable	5	7	0	12	0.0%
Other metal	Recyclable	0	0	0	0	0.0%
Food waste	Compostable	1,908	474	2,636	5,018	21.4%
Comp.products/low-grade paper	Compostable	894	1,599	14,769	17,262	73.5%
Yard waste/green waste	Compostable	0	0	0	0	0.0%
Wood pallets/clean wood	Compostable	0	0	0	0	0.0%
C&D debris	Refuse	0	0	0	0	0.0%
Items illegal to throw away	Refuse	0	0	0	0	0.0%
Trash	Refuse	115	156	365	636	2.7%
Liquids	Refuse	3	0	0	3	0.0%
Reusable items	Recyclable	0	4	0	4	0.0%
TOTALS		**3,005**	**2,275**	**18,200**	**23,480**	**100.0%**
Recyclable		*24*	*41*	*421*	*486*	*2.1%*
Compostable		*2,802*	*2,073*	*17,405*	*22,280*	*94.9%*

Exhibit 4 Aggregate Capture and Recycling Rates

Material Category	Stream	Disposed	Recycled	Composted	Total (lbs)	Capture Rate
Corrugated Cardboard	Recyclable	7,935	40,067	146	48,148	83.2%
Mixed recyclable paper	Recyclable	34,319	126,943	16	161,278	78.7%
Containers - Aseptic	Recyclable	525	222	0	747	29.7%
Plastic bottles	Recyclable	20,647	10,058	47	30,752	32.7%
Plastic containers	Recyclable	28,895	4,507	262	33,665	13.4%
Plastic film	Refuse	33,242	4,673	74	37,989	
Expanded polystyrene	Refuse	2,032	171	0	2,203	
Glass bottles/jars	Recyclable	3,521	1,867	0	5,388	34.6%
Alum&steel cans/foils/trays	Recyclable	7,206	7,980	12	15,197	52.5%
Other metal	Recyclable	524	504	0	1,028	49.0%
Food waste	Compostable	84,790	1,571	5,018	91,380	5.5%
Comp.products/low-grade paper	Compostable	76,227	1,163	17,262	94,652	18.2%
Yard waste/green waste	Compostable	296	0	0	296	0.0%
Wood pallets/clean wood	Compostable	11,694	0	0	11,694	0.0%
C&D debris	Refuse	6,192	0	0	6,192	
Items illegal to throw away	Refuse	2,127	260	0	2,387	
Trash	Refuse	67,658	11,503	636	79,798	
Liquids	Refuse	57,926	6,865	3	64,794	
Reusable items	Recyclable	22,469	4,697	4	27,170	17.3%
TOTALS		**468,226**	**223,050**	**23,480**	**714,756**	**34.5%**
Recyclable		*126,042*	*196,844*	*486*	*323,372*	*61.0%*
Compostable		*173,007*	*2,734*	*22,280*	*198,021*	*12.6%*

Exhibit 5 - Recycling and Organics Figures by Location

Municipal Building	Single Stream Recyclables as a Percentage of All Waste Generation	Recycling Contamination Percentage	Organics as a Percentage of All Waste Generation	Organics Contamination Percentage	Current Diversion Rate	Current Capture Rate for Targeted Recyclables and Organics	Maximum Potential Diversion Rate
Apple Valley City Hall	59.4%	8.1%	7.2%	6.0%	66.6%	86.0%	84.9%
Burnsville Ames Center	6.7%	24.4%	N/A	N/A	6.7%	19.5%	44.3%
Eagan City Hall	45.1%	20.2%	4.1%	8.0%	49.2%	74.4%	75.1%
Eagan Community Center	16.7%	34.4%	16.3%	2.1%	33.0%	27.4%	66.2%
Empire Township Town Hall	91.3%	1.0%	N/A	N/A	91.3%	99.1%	92.5%
Farmington City Hall	58.8%	1.0%	N/A	N/A	58.8%	90.1%	89.5%
Hastings City Hall	57.1%	4.4%	N/A	N/A	57.1%	92.7%	71.6%
Inver Grove Heights City Hall	49.8%	12.1%	N/A	N/A	49.8%	70.0%	87.0%
Lakeville City Hall	47.1%	9.4%	N/A	N/A	47.1%	71.1%	90.2%
Mendota Heights City Hall	93.0%	3.1%	N/A	N/A	93.0%	98.8%	97.4%
Rosemount City Hall	20.0%	9.2%	N/A	N/A	20.0%	35.5%	80.0%
South St. Paul City Hall	40.0%	8.7%	N/A	N/A	40.0%	72.5%	72.3%
West St. Paul City Hall	48.0%	36.5%	N/A	N/A	48.0%	63.0%	82.0%

Exhibit A1 - Apple Valley City Hall Characterization Summary

		Recycling			Trash			Organics			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	0.8	2.5%	629	0.4	1.1%	153	0.1	0.3%	8	790	80.6%	100.0%	790
Mixed recyclable paper	Recyclable	18.5	61.1%	15,262	3.3	9.8%	1,377	0.0	0.1%	2	16,640	91.7%	100.0%	16,640
Containers - Aseptic	Recyclable	0.0	0.0%	0	0.0	0.0%	5	0.0	0.0%	0	5	0.0%	100.0%	5
Plastic bottles	Recyclable	5.5	18.1%	4,514	0.2	0.6%	90	0.0	0.0%	0	4,604	98.1%	100.0%	4,604
Plastic containers	Recyclable	0.6	2.1%	515	2.5	7.6%	1,066	0.1	0.3%	10	1,591	33.0%	100.0%	1,591
Plastic film	Refuse	0.7	2.4%	587	2.8	8.5%	1,187	0.5	2.0%	60	1,835		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.3	0.8%	106	0.0	0.0%	0	106		0.0%	
Glass bottles/jars	Recyclable	0.0	0.0%	0	0.3	0.8%	111	0.0	0.0%	0	111	0.0%	100.0%	111
Alum&steel cans/foils/trays	Recyclable	2.4	8.1%	2,010	0.6	1.8%	248	0.0	0.2%	5	2,263	89.0%	100.0%	2,263
Other metal	Recyclable				*Not Found*								100.0%	0
Food waste	Compostable	0.0	0.0%	0	8.2	24.6%	3,451	14.7	63.5%	1908	5,359	35.6%	100.0%	5,359
Comp.products/low-grade paper	Compostable	0.1	0.2%	62	5.8	17.5%	2,459	6.9	29.7%	894	3,414	28.0%	100.0%	3,414
Yard waste/green waste	Compostable				*Not Found*								100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*								100.0%	0
C&D debris	Refuse	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0	0		0.0%	
Items illegal to throw away	Refuse	0.0	0.0%	0	0.2	0.5%	63	0.0	0.0%	0	63		0.0%	
Trash	Refuse	0.9	3.1%	773	5.1	15.4%	2,169	0.9	3.8%	115	3,057		0.0%	
Liquids	Refuse	0.5	1.7%	433	2.0	6.1%	855	0.0	0.1%	3	1,291		0.0%	
Reusable items	Recyclable	0.2	0.7%	175	1.7	5.0%	702	0.0	0.0%	0	877	20.0%	100.0%	877
TOTALS		**30.3**	**100.0%**	**24,960**	**33.3**	**100.0%**	**14,040**	**23.1**	**100.0%**	**3,005**	**42,005**	**66.6%**	**84.9%**	**35,654**
Recyclable		*28.0*	*92.6%*	*23,105*	*8.9*	*26.7%*	*3,751*	*0.2*	*0.8%*	*24*	*26,881*	86.0%		
Compostable		*0.1*	*0.2%*	*62*	*14.0*	*42.1%*	*5,909*	*21.6*	*93.2%*	*2,802*	*8,773*	31.9%		
Refuse		*2.2*	*7.2%*	*1,793*				*1.4*	*5.9%*	*179*				

Exhibit A1 - Apple Valley City Hall Characterization Summary

		Recycling			Trash			Organics			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	0.8	2.5%	629	0.4	1.1%	153	0.1	0.3%	8	790	80.6%	100.0%	790
Mixed recyclable paper	Recyclable	18.5	61.1%	15,262	3.3	9.8%	1,377	0.0	0.1%	2	16,640	91.7%	100.0%	16,640
Containers - Aseptic	Recyclable	0.0	0.0%	0	0.0	0.0%	5	0.0	0.0%	0	5	0.0%	100.0%	5
Plastic bottles	Recyclable	5.5	18.1%	4,514	0.2	0.6%	90	0.0	0.0%	0	4,604	98.1%	100.0%	4,604
Plastic containers	Recyclable	0.6	2.1%	515	2.5	7.6%	1,066	0.1	0.3%	10	1,591	33.0%	100.0%	1,591
Plastic film	Refuse	0.7	2.4%	587	2.8	8.5%	1,187	0.5	2.0%	60	1,835		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.3	0.8%	106	0.0	0.0%	0	106		0.0%	
Glass bottles/jars	Recyclable	0.0	0.0%	0	0.3	0.8%	111	0.0	0.0%	0	111	0.0%	100.0%	111
Alum&steel cans/foils/trays	Recyclable	2.4	8.1%	2,010	0.6	1.8%	248	0.0	0.2%	5	2,263	89.0%	100.0%	2,263
Other metal	Recyclable				*Not Found*								100.0%	0
Food waste	Compostable	0.0	0.0%	0	8.2	24.6%	3,451	14.7	63.5%	1908	5,359	35.6%	100.0%	5,359
Comp.products/low-grade paper	Compostable	0.1	0.2%	62	5.8	17.5%	2,459	6.9	29.7%	894	3,414	28.0%	100.0%	3,414
Yard waste/green waste	Compostable				*Not Found*								100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*								100.0%	0
C&D debris	Refuse	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0	0		0.0%	
Items illegal to throw away	Refuse	0.0	0.0%	0	0.2	0.5%	63	0.0	0.0%	0	63		0.0%	
Trash	Refuse	0.9	3.1%	773	5.1	15.4%	2,169	0.9	3.8%	115	3,057		0.0%	
Liquids	Refuse	0.5	1.7%	433	2.0	6.1%	855	0.0	0.1%	3	1,291		0.0%	
Reusable items	Recyclable	0.2	0.7%	175	1.7	5.0%	702	0.0	0.0%	0	877	20.0%	100.0%	877
TOTALS		**30.3**	**100.0%**	**24,960**	**33.3**	**100.0%**	**14,040**	**23.1**	**100.0%**	**3,005**	**42,005**	**66.6%**	**84.9%**	**35,654**
Recyclable		*28.0*	*92.6%*	*23,105*	*8.9*	*26.7%*	*3,751*	*0.2*	*0.8%*	*24*	*26,881*	86.0%		
Compostable		*0.1*	*0.2%*	*62*	*14.0*	*42.1%*	*5,909*	*21.6*	*93.2%*	*2,802*	*8,773*	31.9%		
Refuse		*2.2*	*7.2%*	*1,793*				*1.4*	*5.9%*	*179*				

APPENDIX B – BURNSVILLE AMES CENTER

B1. WASTE GENERATION

MSW Consultants deployed to the Burnsville Ames Center on February 21, 2017 to sort trash and recyclables that had been set aside from previous days by Center staff. Dakota Valley Recycling staff assisted MSW with the sort. No issues were encountered during the activity and the Center was very accommodating for the project.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table B1 estimates the annual generation of each of the material streams identified in the sort. Annual generation has been estimated based on estimated number of event container rentals and an average container density. For recyclables, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility currently recycles roughly 7% of the total waste generated.

Table B1 Burnsville Ames Center Annual Waste Generation

Material Stream	Container Size/ Amount Generated	Weekly Collection Frequency	Accumulation Time	Density (lbs./CY)	Estimated Annual Quantity (lbs.)	Percent of Total
Trash	20.0 yd	2	N/A	90	187,200	93.3%
Recycling	74.5 lbs	N/A	2 days	N/A	13,550	6.7%
Total					**200,750**	**100.0%**

At the request of Dakota Valley Recycling staff, MSW also analyzed the waste audit results based only on the two days of accumulation that existed for the audit. Actual generation of Trash and Recycling, and the implied recycling rate, are presented as Table B2 below. It is noteworthy that both methods of estimating the recycling rate provide relatively comparable results. The annual generation estimates in Table B1 have been integrated into the summary of all buildings.

Table B2 Burnsville Ames Center Alternate Waste Generation – Generation During Audit

Material Stream	Container Size/ Amount Generated	Percent of Total
Trash	423.2 lbs.	85.0%
Recycling	74.5 lbs.	15.0%
Total	**497.7**	**100.0%**

B2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the Burnsville Ames Center are presented in Exhibit B1 at the end of this facility section.

This table contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the Recycling Rate, the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the

facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for Burnsville Ames Center was found to be 19.5%. This table also shows the aggregate Recycling Rate of 6.7%, as reported above. Exhibit B1 (Alternate) also follows with the glimpse in time analysis.

Figure B1 displays the breakdown of the breakdown of trash collected. As summarized in Exhibit B1, 19.7% of the materials sorted from the trash stream were Recyclable and 44.6% were Compostable.

Figure B1 Burnsville Ames Center Trash Stream Composition Summary

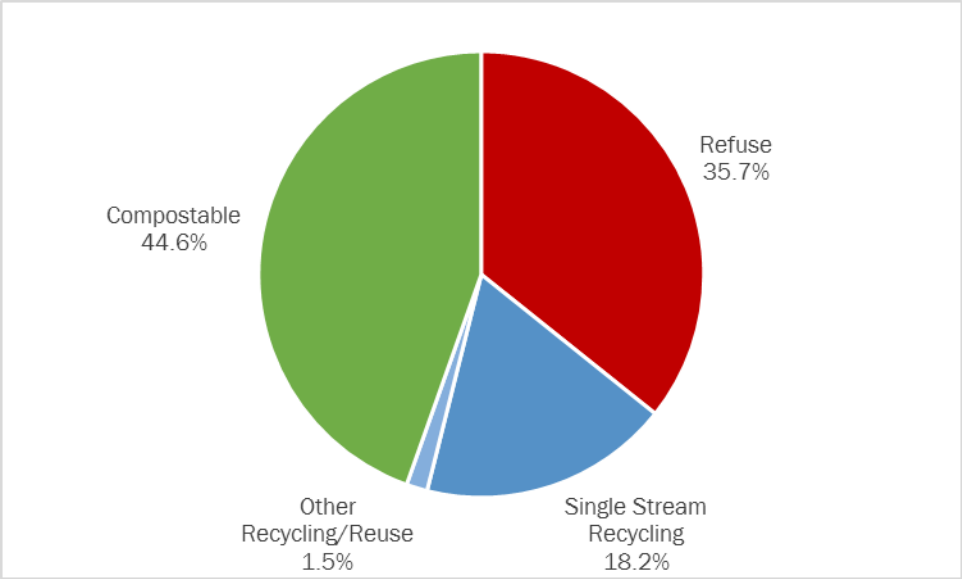
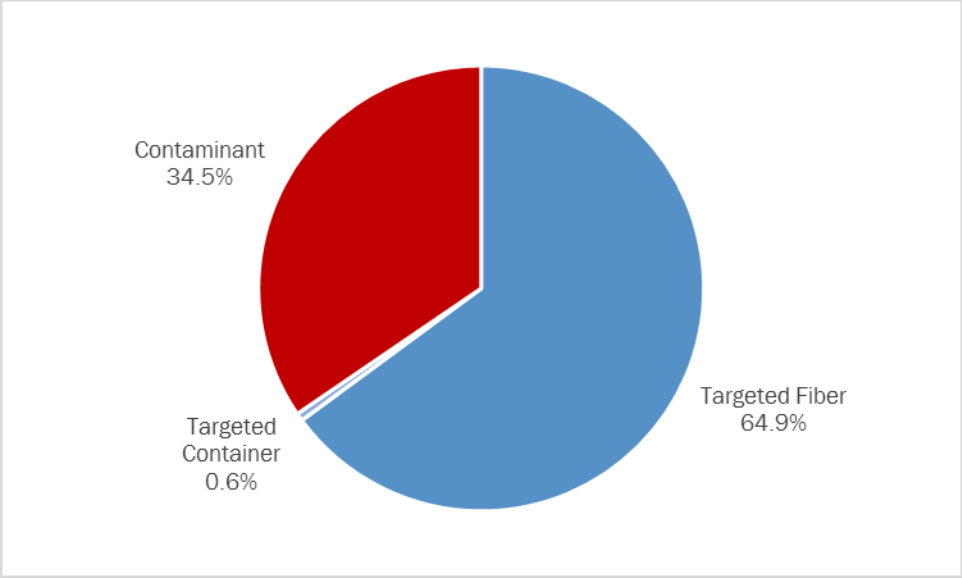


Figure B2 shows the breakdown of recyclables collected. As shown, Targeted Fiber was the most commonly recycled material group. A 34.5% contamination breakout is rather high and indicates need for continued efforts to decrease these materials being placed in recycling containers.

Figure B2 Burnsville Ames Center Recycling Stream Composition Summary



B3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- A large dance competition was held the weekend before the sort. A large amount of event-related materials were found in the recycling container, such as plastic bead necklaces and clapping hand fan toys, indicating a disregard or unawareness by the depositors of the appropriate receptacles to use. Additionally, many of the water/soda bottles were full or mostly full, as were smoothie or other concession beverage containers.
- Contamination in the recycling stream was fairly high. The fact the Center is utilized more heavily by the public and visitors from outside the area make educational efforts and signage all the more important. Improved signage on containers, notation of recycling requirements in room reservation forms and verbal reminders by staff when showing rooms to users may reduce contamination.
- While paper/OCC recycling capture rates were very high, most of the recyclable bottles and cans were not placed in recycling containers. Although the generation of these containers is minimal, increasing diversion of these items could be improved with signage and other education efforts.
- Over 44% of the material was found to be compostable. There seems to be great potential for a segregated Organics collection if the service is available and the integrity of the material can be maintained and not cross-contaminated. Concentrating organics collections in the restrooms would be a good first step to introduce the program while minimizing contamination opportunities.
- On a follow-up visit, six (6) empty water softener salt bags were noted in the recycling container. These items are not currently recyclable in the single-stream recycling system.
- The maximum potential diversion rate was determined to be 44.3%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

B4. PHOTO JOURNAL

The following photos illustrate setup and materials that were sorted at the Burnsville Ames Center facility.

Trash Accumulation Sorted

Recycling Accumulation Sorted

Trash Dumpster

Recycling Dumpster

Recycling Collection Cart

Exhibit B1 - Burnsville Ames Center Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	26.8	35.9%	4,871	3.0	2.8%	5,243	10,114	48.2%	100.0%	10,114
Mixed recyclable paper	Recyclable	21.6	29.0%	3,924	4.4	4.1%	7,721	11,645	33.7%	100.0%	11,645
Containers - Aseptic	Recyclable				*Not Found*					100.0%	0
Plastic bottles	Recyclable	0.1	0.1%	11	5.5	5.2%	9,778	9,789	0.1%	100.0%	9,789
Plastic containers	Recyclable	0.2	0.3%	41	4.1	3.8%	7,168	7,209	0.6%	100.0%	7,209
Plastic film	Refuse	2.0	2.6%	357	9.5	9.0%	16,857	17,214		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.4	0.4%	796	796		0.0%	
Glass bottles/jars	Recyclable	0.0	0.0%	0	1.6	1.5%	2,854	2,854	0.0%	100.0%	2,854
Alum&steel cans/foils/trays	Recyclable	0.1	0.2%	25	0.7	0.7%	1,305	1,330	1.9%	100.0%	1,330
Other metal	Recyclable				*Not Found*					100.0%	0
Food waste	Compostable	6.2	8.3%	1,124	28.0	26.4%	49,466	50,590	0.0%	100.0%	50,590
Comp.products/low-grade paper	Compostable	1.0	1.3%	177	19.2	18.1%	33,936	34,113	0.0%	100.0%	34,113
Yard waste/green waste	Compostable				*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*					100.0%	0
C&D debris	Refuse				*Not Found*					0.0%	
Items illegal to throw away	Refuse	0.0	0.0%	0	0.1	0.0%	88	88		0.0%	
Trash	Refuse	12.4	16.7%	2,257	7.0	6.6%	12,366	14,623		0.0%	
Liquids	Refuse	3.8	5.1%	687	20.8	19.6%	36,767	37,455		0.0%	
Reusable items	Recyclable	0.4	0.6%	75	1.6	1.5%	2,854	2,929	2.6%	100.0%	2,929
TOTALS		74.5	**100.0%**	**13,550**	105.8	**100.0%**	**187,200**	**200,750**	**6.7%**	**44.3%**	**88,962**
Recyclable		*49.2*	*66.0%*	*8,948*	*20.9*	*19.7%*	*36,922*	*45,870*	19.5%		
Compostable		*7.2*	*9.6%*	*1,301*	*47.1*	*44.6%*	*83,402*	*84,703*	0.0%		
Refuse		*18.1*	*24.4%*	*3,301*							

Exhibit B1 (ALTERNATE) - Burnsville Ames Center Characterization Summary for Generation During Audit

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Generation (lbs)	Lbs Sorted	Compo-sition	Generation (lbs)	Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	26.8	35.9%	27	3.0	2.8%	12	39	69.3%	100.0%	39
Mixed recyclable paper	Recyclable	21.6	29.0%	22	4.4	4.1%	17	39	55.3%	100.0%	39
Containers - Aseptic	Recyclable				*Not Found*					100.0%	0
Plastic bottles	Recyclable	0.1	0.1%	0	5.5	5.2%	22	22	0.3%	100.0%	22
Plastic containers	Recyclable	0.2	0.3%	0	4.1	3.8%	16	16	1.4%	100.0%	16
Plastic film	Refuse	2.0	2.6%	2	9.5	9.0%	38	40		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.4	0.4%	2	2		0.0%	
Glass bottles/jars	Recyclable	0.0	0.0%	0	1.6	1.5%	6	6	0.0%	100.0%	6
Alum&steel cans/foils/trays	Recyclable	0.1	0.2%	0	0.7	0.7%	3	3	4.5%	100.0%	3
Other metal	Recyclable				*Not Found*					100.0%	0
Food waste	Compostable	6.2	8.3%	6	28.0	26.4%	112	118	0.0%	100.0%	118
Comp.products/low-grade paper	Compostable	1.0	1.3%	1	19.2	18.1%	77	78	0.0%	100.0%	78
Yard waste/green waste	Compostable				*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*					100.0%	0
C&D debris	Refuse				*Not Found*					0.0%	
Items illegal to throw away	Refuse	0.0	0.0%	0	0.1	0.0%	0	0		0.0%	
Trash	Refuse	12.4	16.7%	12	7.0	6.6%	28	40		0.0%	
Liquids	Refuse	3.8	5.1%	4	20.8	19.6%	83	87		0.0%	
Reusable items	Recyclable	0.4	0.6%	0	1.6	1.5%	6	7	6.0%	100.0%	7
TOTALS		74.5	**100.0%**	**74**	105.8	**100.0%**	**423**	**498**	**15.0%**	**41.3%**	**206**
Recyclable		*49.2*	*66.0%*	*49*	*20.9*	*19.7%*	*83*	*133*	37.1%		
Compostable		*7.2*	*9.6%*	*7*	*47.1*	*44.6%*	*189*	*196*	0.0%		
Refuse		*18.1*	*24.4%*	*18*							

APPENDIX C – EAGAN CITY HALL

C1. WASTE GENERATION

MSW Consultants deployed to the Eagan City Hall on February 8, 2017 to sort trash, recyclables and organics that had been set aside from previous days by city staff. No issues were encountered during the activity and the City was very accommodating for the project.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or by extrapolating annual volumes from the quantities that accumulated prior to this activity. Table 1 estimates the annual generation of each of the material streams identified in the waste and recyclables sort. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility diverts almost 50% of the total waste generated.

Table 1 Eagan City Hall Annual Waste Generation

Material Stream	Container Size/ Amount Generated		Weekly Collection Frequency	Accumulation Time	Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	3	yd	2	N/A	90	28,080	50.8%
Recycling	2	yd	2	N/A	120	24,960	45.1%
Organics	0.3	yd	1	N/A	175	2,275	4.1%
Total						**55,315**	**100.0%**

C2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the Eagan City Hall are presented in Exhibit C1 at the end of this facility section.

This table contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the Recycling Rate, the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for Eagan City Hall was found to be 74.4%, which is particularly high in light of the facility targeted food wastes and compostable papers for diversion in the organics program. This table also shows the aggregate Recycling Rate of 45.1%, as reported above.

Figure C1 displays the breakdown of wastes and recyclables based on the data in Exhibit C1. As summarized in Exhibit C1, 24.8% of the materials sorted from the trash stream were Recyclable and 42.9% were Compostable.

Figure C1 Eagan City Hall Waste Generation Summary

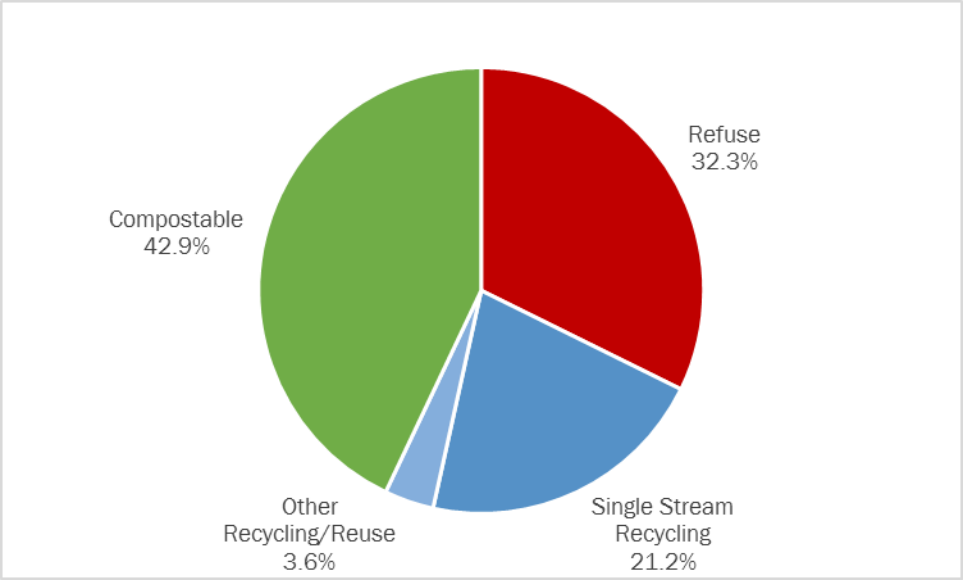


Figure C2 shows the breakdown of recyclables collected. As shown, Targeted Fiber was the most commonly recycled material group. With 20.2% contamination, the recycling stream is fairly contaminated. Several reusable items were found in all three material streams and contributed to this amount.

Figure C2 Eagan City Hall Recycling Stream Composition Summary

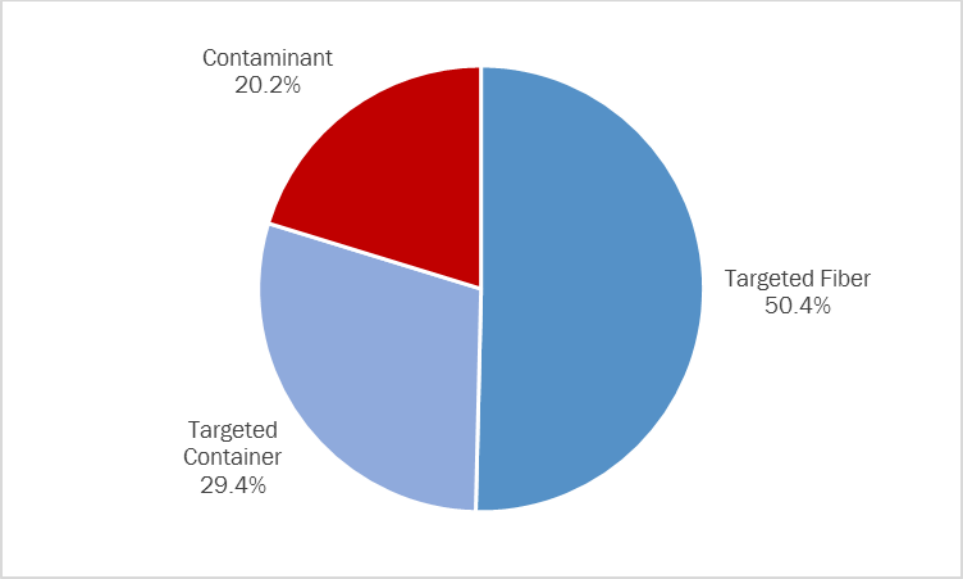
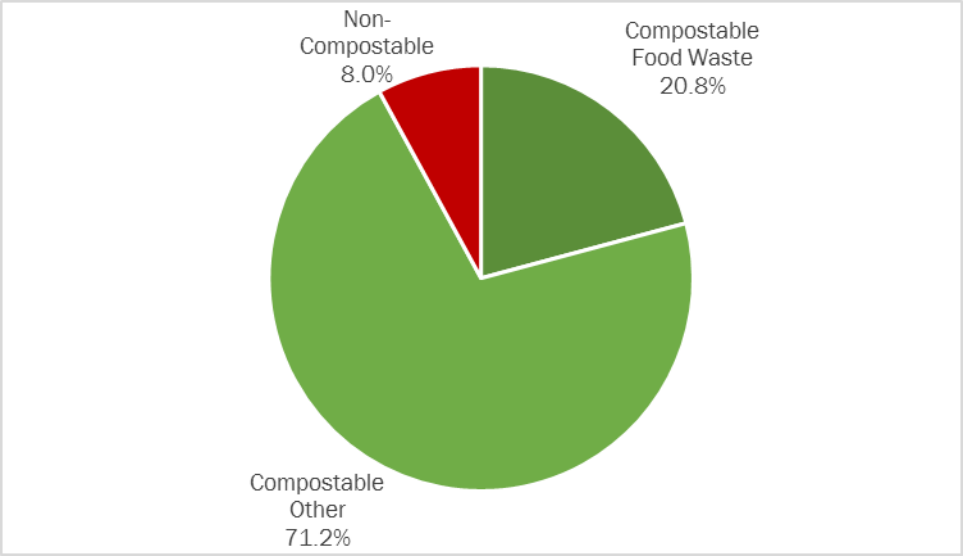


Figure C3 shows the breakdown of the Organics collected. Contamination was much lower in the Organics stream compared to the Recycling stream.

Figure C3 Eagan City Hall Organic Stream Composition Summary



C3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- Organics collection is reducing the non-divertible waste stream, but over 40% of the Trash stream continues to be compostable materials. Continued education and training should target these items.
- A few confidential items were sorted from the Organic materials and turned over to the Recycling staff.
- Reusable items were located in all three material streams at Eagan. The main items were file folders, 3-ring binders, and partial toilet paper rolls with large amounts of useable material remaining.
- Alkaline Batteries are typically recyclable. Batteries found during the sort were turned over to the Recycling staff.
- The maximum potential diversion rate was determined to be 75.1%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

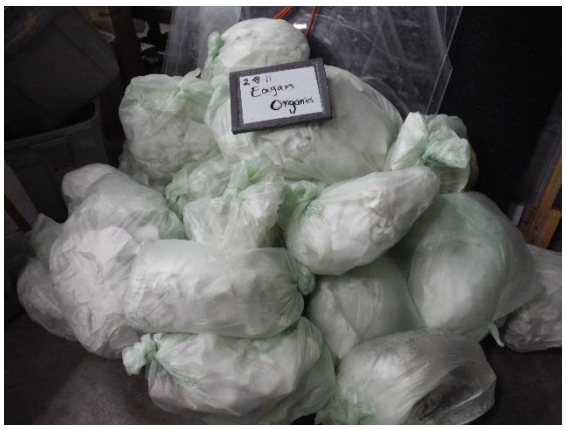
C4. PHOTO JOURNAL

The following photos illustrate the setup and materials that were sorted at the City of Eagan facility.

Trash Accumulation Sorted

Recycling Accumulation Sorted

Organics Accumulation Sorted



Sorting Activity

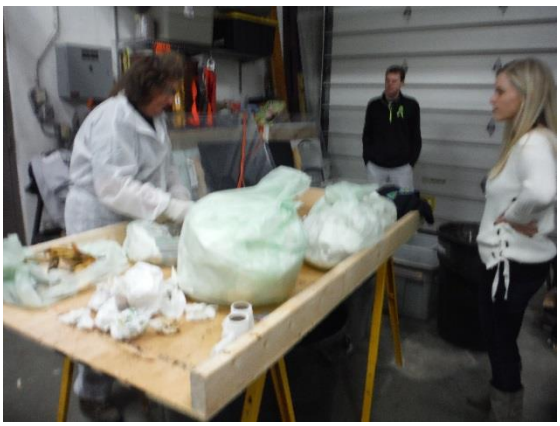


Exhibit C1 - Eagan City Hall Characterization Summary

		Recycling			Trash			Organics			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	0.8	4.0%	987	0.5	1.2%	327	0.2	0.7%	16	1,330	75.4%	100.0%	1,330
Mixed recyclable paper	Recyclable	9.4	45.5%	11,368	2.7	6.7%	1,883	0.1	0.2%	5	13,255	85.8%	100.0%	13,255
Containers - Aseptic	Recyclable	0.2	0.9%	222	0.3	0.7%	186	0.0	0.0%	0	407	54.4%	100.0%	407
Plastic bottles	Recyclable	2.6	12.7%	3,172	1.1	2.7%	751	0.0	0.0%	0	3,923	80.9%	100.0%	3,923
Plastic containers	Recyclable	1.1	5.5%	1,366	2.6	6.5%	1,821	0.1	0.4%	10	3,196	43.0%	100.0%	3,196
Plastic film	Refuse	0.6	3.0%	744	3.1	7.7%	2,165	0.1	0.2%	5	2,914		0.0%	
Expanded polystyrene	Refuse	0.1	0.2%	61	0.6	1.4%	389	0.0	0.0%	0	450		0.0%	
Glass bottles/jars	Recyclable	0.6	3.0%	744	0.0	0.0%	0	0.0	0.0%	0	744	100.0%	100.0%	744
Alum&steel cans/foils/trays	Recyclable	1.7	8.2%	2,049	1.4	3.5%	981	0.1	0.3%	7	3,037	67.7%	100.0%	3,037
Other metal	Recyclable	0.0	0.0%	0	0.1	0.3%	80	0.0	0.0%	0	80	0.0%	100.0%	80
Food waste	Compostable	0.0	0.0%	0	11.5	28.9%	8,114	6.2	20.8%	474	8,588	5.5%	100.0%	8,588
Comp.products/low-grade paper	Compostable	0.1	0.6%	152	5.6	14.0%	3,942	20.8	70.3%	1599	5,692	30.8%	100.0%	5,692
Yard waste/green waste	Compostable				*Not Found*								100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*								100.0%	0
C&D debris	Refuse				*Not Found*								0.0%	
Items illegal to throw away	Refuse	0.0	0.0%	0	0.2	0.5%	141	0.0	0.0%	0	141		0.0%	
Trash	Refuse	0.5	2.4%	592	6.2	15.7%	4,410	2.0	6.9%	156	5,159		0.0%	
Liquids	Refuse	2.6	12.5%	3,126	2.8	7.0%	1,962	0.0	0.0%	0	5,089		0.0%	
Reusable items	Recyclable	0.3	1.5%	379	1.3	3.3%	928	0.1	0.2%	4	1,311	29.2%	100.0%	1,311
TOTALS		**20.6**	**100.0%**	**24,960**	**39.7**	**100.0%**	**28,080**	**29.6**	**100.0%**	**2,275**	**55,315**	**49.2%**	**75.1%**	**41,563**
Recyclable		*16.7*	*81.3%*	*20,286*	*9.8*	*24.8%*	*6,956*	*0.5*	*1.8%*	*41*	*27,283*	74.4%		
Compostable		*0.1*	*0.6%*	*152*	*17.1*	*42.9%*	*12,056*	*27.0*	*91.1%*	*2,073*	*14,280*	14.5%		
Refuse		*3.7*	*18.1%*	*4,523*				*2.1*	*7.1%*	*161*				

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APPENDIX D – EAGAN COMMUNITY CENTER

D1. WASTE GENERATION

MSW Consultants deployed to the Eagan Community Center on February 11, 2017 to sort trash, recycling and organics that had been set aside from previous days by center staff. There was very little material in the Trash and Recycling dumpsters, though a fair amount of material was in the Organics container. Though facility staff had been instructed to set materials aside the previous two days and confirmed they had, it appears likely that the containers had been recently serviced. The composition of disposed wastes and recyclables may therefore be less representative than had all materials been accumulated for a longer period of time.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table 1 estimates the annual generation of each of the material streams identified in the sort. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility diverts 33% of total the waste generated.

Table 1 Eagan Community Center Annual Waste Generation

Material Stream	Container Size/ Amount Generated		Weekly Collection Frequency	Accumulation Time	Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	4	yd	4	N/A	90	74,880	67.0%
Recycling	3	yd	1	N/A	120	18,720	16.7%
Organics	2.0	yd	1	N/A	175	18,200	16.3%
Total						**111,800**	**100.0%**

D2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the Eagan Community Center are presented in Exhibit 1 at the end of this facility section.

This exhibit contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High capture rates suggest the facility staff are aware of and actively using recycling programs. Lower capture rates suggest there may be opportunities for improvement. The capture rate for all targeted recyclables for Eagan Community Center was found to be 27.4%. This table also shows the aggregate Recycling Rate of 16.7%, as reported above.

Figure 1 displays the composition of the Trash collected. As summarized in Exhibit 1, 43.4% of the materials sorted from the trash stream were Recyclable and 14.5% were Compostable.

Figure 1 Eagan Community Center Trash Stream Composition Summary

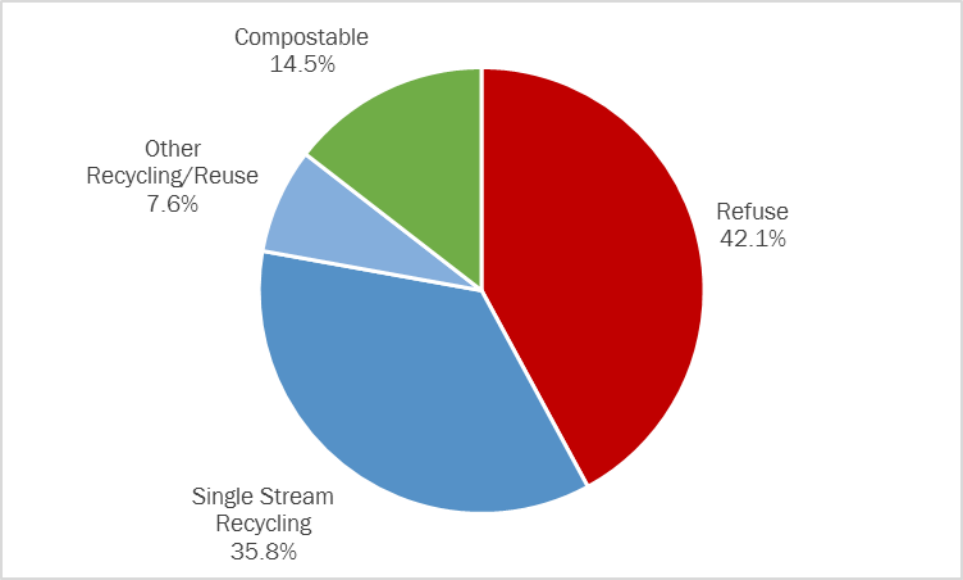


Figure 2 shows the breakdown of recycling collected. As shown, Targeted Fiber was the most commonly recycled material group. With 34.4% contamination, the recycling stream is highly contaminated. Wastes from birthday parties were found in the recycling stream, representing a major portion of this stream.

Figure 2 Eagan Community Center Recycling Stream Composition Summary

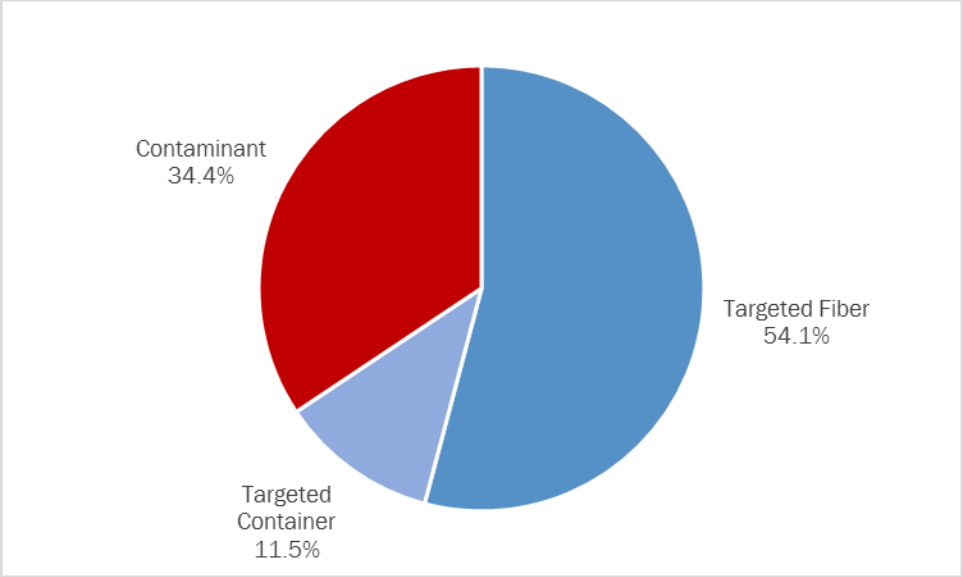
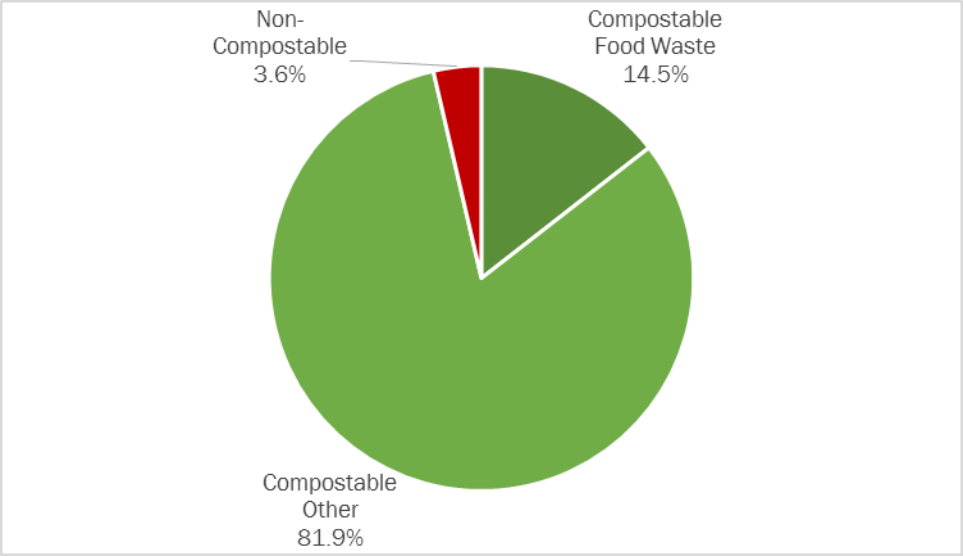


Figure 3 shows the breakdown of the Organics collected. The Organics stream was found to have very little contamination.

Figure 3 Eagan Community Center Organic Stream Composition Summary



D3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- Reusable plastic cake servers were in the Recycling dumpster, and the majority of other materials in the recycling seemed to be cleanup from a birthday party and were not acceptable recyclables. Community centers by nature accommodate many individuals and recycling can be more challenging in such venues. It is recommended that better signage, with pictures, be placed on Recycling containers, that recycling information be added to room rental information and that staff explain recycling "dos and don'ts" when escorting people to reserved rooms.
- Several recyclable textiles were located in the Trash.
- The Organic material stream was very clean, compostable material. Contamination was only from reserved rooms or party areas. Because organics separation is relatively new in the region, emphasis to educate building users should be placed on what is, or isn't, compostable, or organics should only be collected in rest rooms at this time.
- The County may wish to consider re-auditing this location at some point in the future in an attempt to obtain a larger sample of disposed wastes and recyclables.
- The maximum potential diversion rate was determined to be 66.2%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

D4. PHOTO JOURNAL

The following photos illustrate the setup and materials that were sorted at the Eagan Community Center facility.

Sorting location

Community Center

Trash Accumulation Sorted

Recycling Accumulation Sorted

Sorting Area Setup

Few Contaminants Found in Organics

Few Contaminants Found in Organics

Few Contaminants Were Found in Organics

Other Contaminants Found in Organics

Other Contaminants Found in Organics

Other Contaminants Found in Organics

Exhibit D1 - Eagan Community Center Characterization Summary

		Recycling			Trash			Organics			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	11.3	47.0%	8,794	0.0	0.0%	0	0.2	0.7%	122	8,915	100.0%	100.0%	8,915
Mixed recyclable paper	Recyclable	1.7	7.1%	1,337	0.3	3.9%	2,928	0.0	0.1%	9	4,275	31.5%	100.0%	4,275
Containers - Aseptic	Recyclable	0.0	0.0%	0	0.0	0.2%	139	0.0	0.0%	0	139	0.0%	100.0%	139
Plastic bottles	Recyclable	0.0	0.0%	0	0.7	9.9%	7,390	0.1	0.3%	47	7,437	0.6%	100.0%	7,437
Plastic containers	Recyclable	2.4	10.1%	1,893	1.3	19.0%	14,223	0.3	1.3%	243	16,360	13.1%	100.0%	16,360
Plastic film	Refuse	2.0	8.2%	1,532	0.5	6.9%	5,159	0.0	0.1%	9	6,701		0.0%	
Expanded polystyrene	Refuse	0.1	0.4%	78	0.0	0.0%	0	0.0	0.0%	0	78		0.0%	
Glass bottles/jars	Recyclable				*Not Found*								100.0%	
Alum&steel cans/foils/trays	Recyclable	0.3	1.4%	264	0.2	2.8%	2,092	0.0	0.0%	0	2,355	11.2%	100.0%	2,355
Other metal	Recyclable				*Not Found*								100.0%	0
Food waste	Compostable	0.4	1.6%	293	0.0	0.0%	0	3.5	14.5%	2636	2,929	100.0%	100.0%	2,929
Comp.products/low-grade paper	Compostable	0.2	0.7%	137	1.0	14.5%	10,876	19.8	81.2%	14769	25,782	57.8%	100.0%	25,782
Yard waste/green waste	Compostable				*Not Found*								100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*								100.0%	0
C&D debris	Refuse				*Not Found*								0.0%	
Items illegal to throw away	Refuse				*Not Found*								0.0%	
Trash	Refuse	5.0	21.0%	3,933	1.2	17.7%	13,247	0.5	2.0%	365	17,545		0.0%	
Liquids	Refuse	0.4	1.8%	332	1.2	17.5%	13,107	0.0	0.0%	0	13,439		0.0%	
Reusable items	Recyclable	0.2	0.7%	127	0.5	7.6%	5,717	0.0	0.0%	0	5,844	2.2%	100.0%	5,844
TOTALS		**24.0**	**100.0%**	**18,720**	**6.7**	**100.0%**	**74,880**	**24.3**	**100.0%**	**18,200**	**111,800**	**33.0%**	**66.2%**	**74,037**
Recyclable		*15.9*	*66.3%*	*12,415*	*2.9*	*43.4%*	*32,490*	*0.6*	*2.3%*	*421*	*45,325*	27.4%		
Compostable		*0.5*	*2.3%*	*429*	*1.0*	*14.5%*	*10,876*	*23.3*	*95.6%*	*17,405*	*28,711*	60.6%		
Refuse		*7.5*	*31.4%*	*5,876*				*0.5*	*2.1%*	*374*				

APPENDIX E – EMPIRE TOWNSHIP

E1. WASTE GENERATION

MSW Consultants deployed to the Empire Township Town Hall on February 14, 2017 to sort trash and recyclables that had been set aside for the previous week. Being a very small building with fewer than two full-time-equivalent (FTE) employees at the location, there was a nominal amount of waste. Recycling is collected from this location and what little trash that remains after recycling is taken by staff to the Public Works dumpster at a different location. The MSW sort team also visited the Public Works waste container area and observed the dumpster contents. No issues were encountered during the sorting activity and the staff was very helpful in providing space and information for the project.

In the professional opinion of MSW Consultants, the vast majority of wastes contained in the Public Works dumpster appeared to be illegal dumping/ditch cleanup material. This material was not evaluated during the sort because it clearly did not originate from the Town Hall. We were told by city staff that the refuse dumpster at this facility is routinely used by city staff to clean up illegal dumping along the roadways, and we have attempted to analyze only the wastes that appeared to be generated in a town hall and not by the Public Works department or other generators.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table 1 estimates the annual generation of each of the material streams identified in the audit. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort.

Table 1 Empire Township Annual Waste Generation

Material Stream	Container Size/ Amount Generated	Weekly Collection Frequency	Accumulation Time	Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	3.7 lbs	1	5 days	N/A	192	8.7%
Recycling	38.7 lbs	1	5 days	N/A	2,012	91.3%
Total					**2,204**	**100.0%**

As shown, the facility is currently estimated to recycle over 91% of the waste generated which is exceptional.

E2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for Empire Township are presented in Exhibit 1 at the end of this facility section.

This table contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for Empire Township was found to be 99.1%. This table also shows the aggregate Recycling Rate of 91.3%, as reported above.

Figure 1 shows the composition of the Trash stream. As summarized in Exhibit 1, 9.5% of the materials sorted from the trash stream were Recyclable and 4.7% were Compostable.

Figure 1 Empire Township Trash Stream Composition Summary

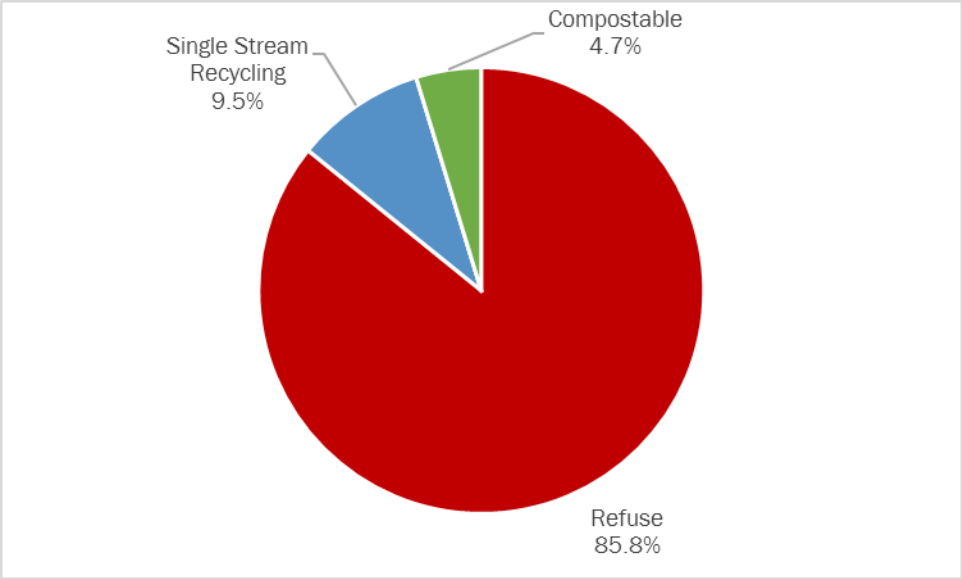
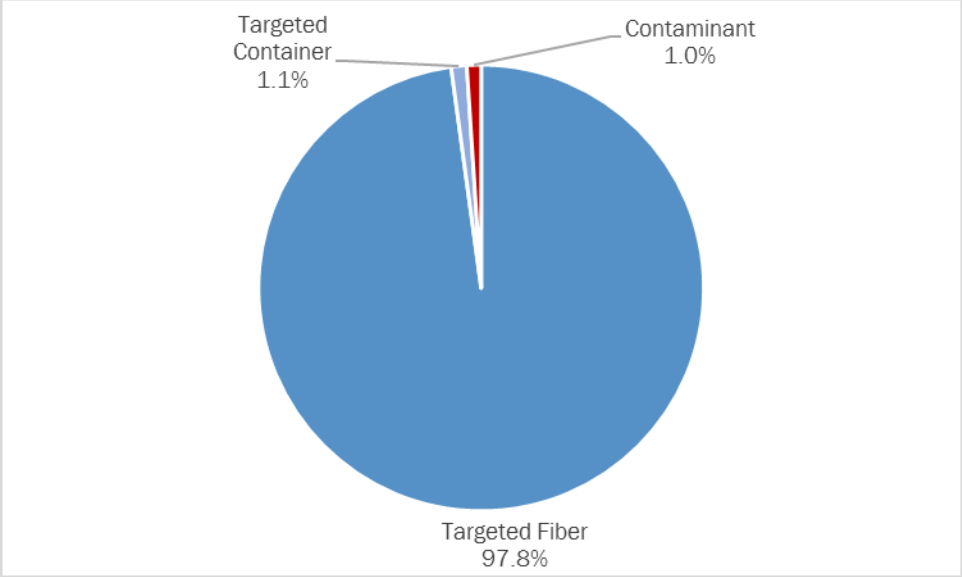


Figure 2 shows the breakdown of recycling collected. As shown, Targeted Fiber was the vast majority of the material at 97.8%.

Figure 2 Empire Township Recycling Stream Composition Summary



E3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- With a very small staff and few people passing through the facility, this is a controlled material stream. The staff is dedicated to recycling as much as possible and are doing a great job.
- The Recycling stream was very clean, with a large amount of shredded paper. MSW staff encouraged staff to bag shred paper in a clear bag to enable identification as well as avoid flyaway litter during collection and hauling, and maintaining the product's integrity at the processing facility. To ensure

the best potential for this material to be recycled, it is recommended that the town discuss with their hauler and processor to see how the material should be prepared.

- The maximum potential diversion rate was determined to be 92.5%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

E4. PHOTO JOURNAL

The following photos illustrate setup and materials that were sorted at the Empire Township Town Hall as well as the waste observed at the Public Works Facility where the collected Town Hall waste is combined along with illegal dumped cleanup materials.

Sorting location

Town Hall

Trash Accumulation Sorted

Small, office-size trash container

Recycling Accumulation Sorted

Public Works Facility

Trash dumpster location

Public Works Dumpster

Other than cardboard, which should be recycled, the rest of the materials appeared to be weathered material cleaned up from illegal dumping.

Public Works Dumpster

Furniture

Public Works Dumpster enclosure

Electronics tires, etc. from cleanup of illegal dumping.

Exhibit E1 - Empire Township Hall Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	4.4	11.4%	229	0.1	1.7%	3	233	98.6%	100.0%	233
Mixed recyclable paper	Recyclable	33.4	86.4%	1,739	0.2	5.7%	11	1,750	99.4%	100.0%	1,750
Containers - Aseptic	Recyclable	0.0	0.0%	0	0.1	1.7%	3	3	0.0%	100.0%	3
Plastic bottles	Recyclable	0.3	0.7%	14	0.0	0.3%	1	14	95.5%	100.0%	14
Plastic containers	Recyclable	0.2	0.5%	9	0.0	0.0%	0	9	100.0%	100.0%	9
Plastic film	Refuse	0.0	0.0%	0	0.8	22.0%	42	42		0.0%	
Expanded polystyrene	Refuse				*Not Found*					0.0%	
Glass bottles/jars	Recyclable				*Not Found*					100.0%	0
Alum&steel cans/foils/trays	Recyclable				*Not Found*					100.0%	0
Other metal	Recyclable				*Not Found*					100.0%	0
Food waste	Compostable				*Not Found*					100.0%	0
Comp.products/low-grade paper	Compostable	0.0	0.0%	0	0.2	4.7%	9	9	0.0%	100.0%	9
Yard waste/green waste	Compostable				*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*					100.0%	0
C&D debris	Refuse	0.0	0.0%	0	1.1	29.1%	56	56		0.0%	
Items illegal to throw away	Refuse				*Not Found*					0.0%	
Trash	Refuse	0.0	0.0%	0	1.3	34.8%	67	67		0.0%	
Liquids	Refuse				*Not Found*					0.0%	
Reusable items	Recyclable	0.4	1.0%	21	0.0	0.0%	0	21	100.0%	100.0%	21
TOTALS		38.7	**100.0%**	**2,012**	3.7	**100.0%**	**192**	**2,204**	**91.3%**	**92.5%**	**2,039**
Recyclable		*38.7*	*100.0%*	*2,012*	*0.4*	*9.5%*	*18*	*2,030*	99.1%		
Compostable		*0.0*	*0.0%*	*0*	*0.2*	*4.7%*	*9*	*9*	0.0%		
Refuse		*0.0*	*0.0%*	*0*							

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APPENDIX F – FARMINGTON CITY HALL

F1. WASTE GENERATION

MSW Consultants deployed to the Farmington City Hall on February 9, 2017 to sort trash and recyclables that had been set aside from previous days by city staff. No issues were encountered during the activity and the city was very accommodating for the project.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table 1 estimates the annual generation of each of the material streams identified in the sort. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility currently recycles nearly 59% of the total waste generated.

Table 1 Farmington City Hall Annual Waste Generation

Material Stream	Container Size/ Amount Generated		Weekly Collection Frequency	Accumulation Time		Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	0.8	yd	2	2	days	90	7,020	41.2%
Recycling	76.9	lbs	N/A	2	days	N/A	10,000	58.8%
Total							**17,020**	**100.0%**

F2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the Farmington City Hall are presented in Exhibit 1 at the end of this facility section.

This exhibit contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High capture rates suggest the facility staff are aware of and actively using recycling programs. Lower capture rates suggest there may be opportunities for improvement. The capture rate for all targeted recyclables for Farmington City Hall was found to be 90.1%. This table also shows the aggregate Recycling Rate of 58.8%, as reported above.

Figure 1 shows the composition of the Trash material stream. As summarized in Exhibit 1, 15.5% of the materials sorted from the trash stream were Recyclable and 59.7% were Compostable.

Figure 1 Farmington City Hall Trash Stream Composition Summary

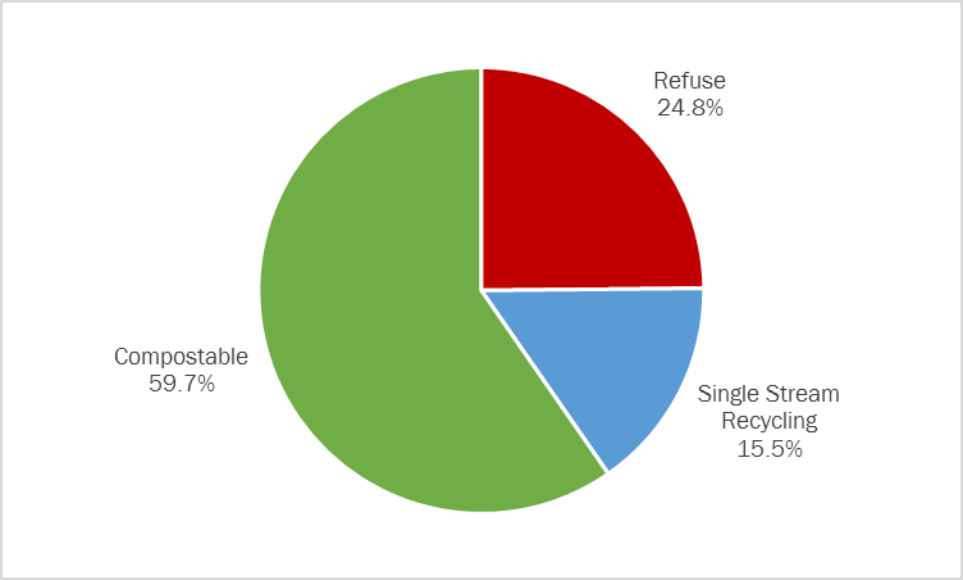
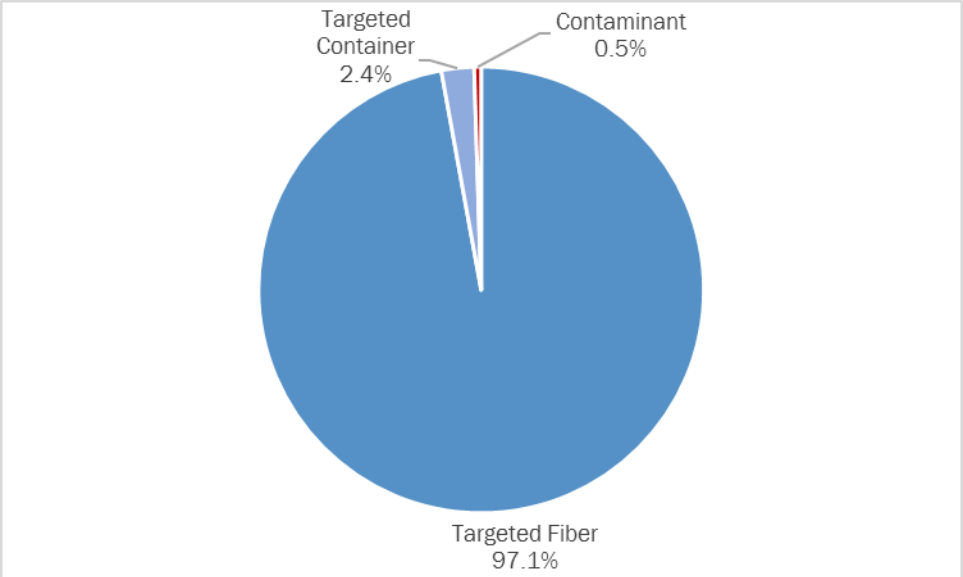


Figure 2 shows the breakdown of Recycling collected. As shown, Targeted Fiber was the vast majority of the material at 97.8%.

Figure 2 Farmington City Hall Recycling Stream Composition Summary



F3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

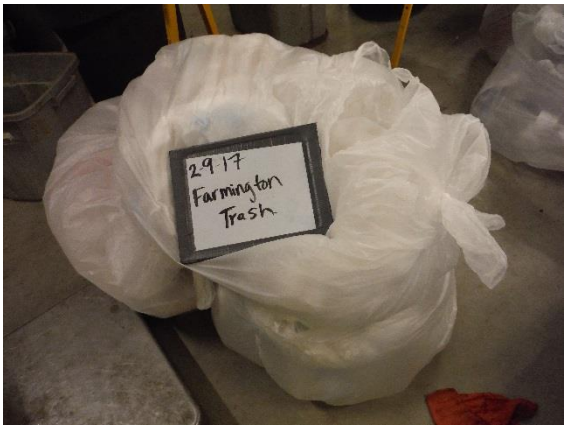
- Capture rates for recyclable corrugated cardboard and mixed paper are excellent, although they were a bit lower for recyclable containers.
- The Recycling material stream was very clean and uncontaminated.
- A limited amount of reusable and illegal-to-dispose-of materials were found in the materials sorted.

- Staff was very interested in thoughts for expanding into Organics collection and enhancing the programs they currently have in place. Initiating organics recovery would further boost diversion rates from this facility.
- The maximum potential diversion rate was determined to be 89.5%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

F4. PHOTO JOURNAL

The following photos illustrate setup and materials that were sorted at the Farmington City Hall.

Trash Accumulation Sorted



Recycling Accumulation Sorted

Sorting Setup

Cardboard Accumulation for Recycling

Illegal Item – Broken Tip Cleaner

Reusable Item

Exhibit F1 - Farmington City Hall Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	50.2	65.3%	6,526	0.1	0.6%	42	6,568	99.4%	100.0%	6,568
Mixed recyclable paper	Recyclable	24.5	31.9%	3,187	1.8	9.5%	669	3,855	82.7%	100.0%	3,855
Containers - Aseptic	Recyclable	0.0			*Not Found*					100.0%	0
Plastic bottles	Recyclable	1.0	1.3%	125	0.2	1.1%	78	204	61.5%	100.0%	204
Plastic containers	Recyclable	0.1	0.1%	10	0.7	3.5%	249	259	3.8%	100.0%	259
Plastic film	Refuse	0.4	0.5%	47	2.0	10.3%	724	771		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.2	1.1%	74	74		0.0%	
Glass bottles/jars	Recyclable				*Not Found*					100.0%	0
Alum&steel cans/foils/trays	Recyclable	0.8	1.0%	102	0.1	0.7%	51	153	66.9%	100.0%	153
Other metal	Recyclable	0.0			*Not Found*					100.0%	0
Food waste	Compostable	0.0	0.0%	0	5.4	28.5%	2,002	2,002	0.0%	100.0%	2,002
Comp.products/low-grade paper	Compostable	0.0	0.0%	3	5.9	31.1%	2,186	2,190	0.0%	100.0%	2,190
Yard waste/green waste	Compostable	0.0			*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable	0.0			*Not Found*					100.0%	0
C&D debris	Refuse	0.0			*Not Found*					0.0%	
Items illegal to throw away	Refuse	0.0	0.0%	0	1.4	7.1%	498	498		0.0%	
Trash	Refuse	0.0	0.0%	0	1.1	6.0%	420	420		0.0%	
Liquids	Refuse	0.0	0.0%	0	0.1	0.4%	28	28		0.0%	
Reusable items	Recyclable				*Not Found*					100.0%	0
TOTALS		76.9	**100.0%**	**10,000**	19.0	**100.0%**	**7,020**	**17,020**	**58.8%**	**89.5%**	**15,230**
Recyclable		*76.5*	*99.5%*	*9,950*	*3.0*	*15.5%*	*1,089*	*11,038*	90.1%		
Compostable		*0.0*	*0.0%*	*3*	*11.4*	*59.7%*	*4,188*	*4,191*	0.0%		
Refuse		*0.4*	*0.5%*	*47*							

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APPENDIX G – HASTINGS CITY HALL

G1. WASTE GENERATION

MSW Consultants deployed to the Hastings City Hall on February 15, 2017 to sort trash and recycling that had been set aside from previous days by city staff. No issues were encountered during the activity and the city was very accommodating for the project.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table 1 estimates the annual generation of each of the material streams identified in the audit. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility currently recycles just over 57% of the waste generated.

Table 1 Hastings City Hall Annual Waste Generation

Material Stream	Container Size/ Amount Generated	Weekly Collection Frequency	Accumulation Time	Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	2.0 yd	1	2 days	90	9,360	42.9%
Recycling	2.0 yd	1	2 days	120	12,480	57.1%
Total					**21,840**	**100.0%**

G2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the Hastings City Hall are presented in Exhibit 1 at the end of this facility section.

This exhibit contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for Hastings City Hall was found to be 92.7%. This table also shows the aggregate Recycling Rate of 57.1%, as reported above.

Figure 1 shows the composition of the Trash material stream. As summarized in Exhibit 1, 10.2% of the materials sorted from the trash stream were Recyclable and 27% were Compostable.

Figure 1 Hastings City Hall Trash Stream Composition Summary

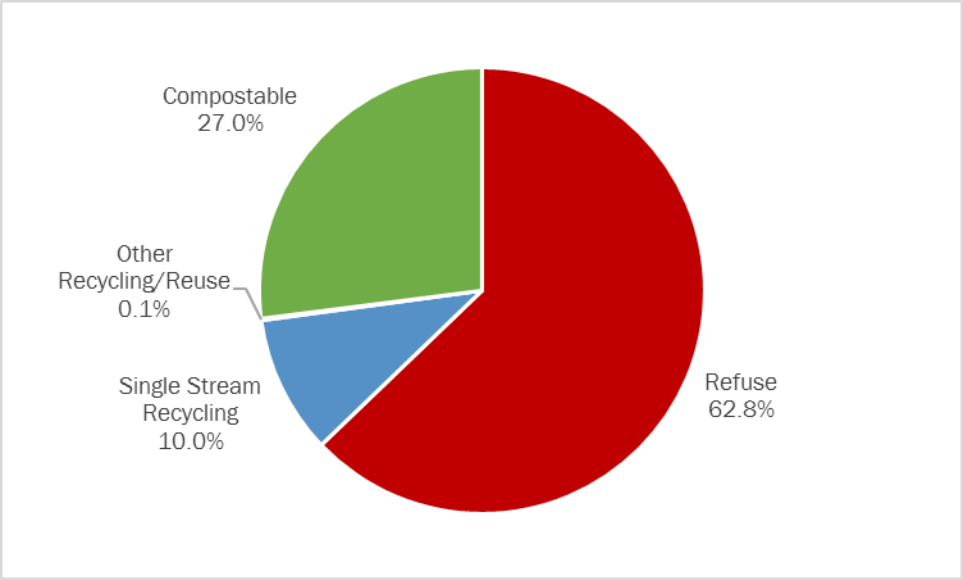
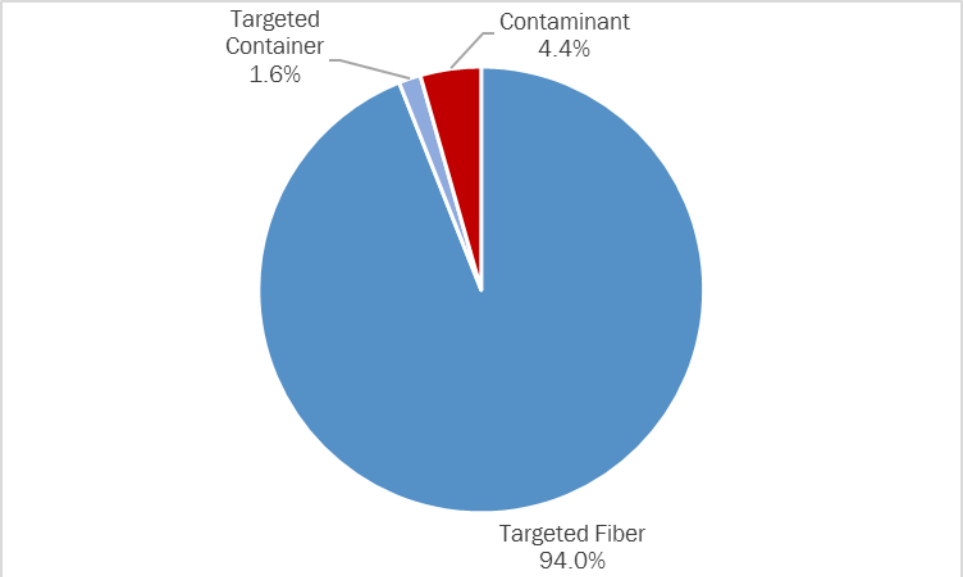


Figure 2 shows the breakdown of Recycling collected. As shown, Targeted Fiber was the vast majority of the material at 94%.

Figure 2 Hastings City Hall Recycling Stream Composition Summary



G3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- Capture rates for recyclable cardboard and mixed paper were excellent, although they were slightly lower for recyclable containers.
- The Recycling stream was very clean. MSW staff suggested to city staff to bag shred paper in a clear bag prior to depositing it in commingled recycling to enable identification and maintain the material's integrity as well as reduce litter potential during collection and hauling. To ensure the best potential for this material to be recycled, it is recommended that the town discuss with their hauler and processor to see how the material should be prepared.

- File folders were identified in the Recycling and page protectors were in the Trash, both of which are classified as Reusable either by the site staff or by donating the material to schools, nonprofits, etc.
- An alkaline battery was found in the Trash, which can be recycled through existing programs.
- Implementation of an Organics program could reduce approximately 27% of the Trash stream. Both food waste from staff consumption and bathroom wastes could be targeted.
- The maximum potential diversion rate was determined to be 71.6%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

G4. PHOTO JOURNAL

The following photos illustrate setup and materials that were sorted at the Hastings City Hall.

Sorting location

City Hall

Trash Accumulation Sorted

Recycling Accumulation Sorted

Sort Area Setup

Exhibit G1 - Hastings City Hall Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	2.0	3.0%	373	0.0	0.0%	0	373	100.0%	100.0%	373
Mixed recyclable paper	Recyclable	61.3	91.0%	11,357	1.9	5.1%	474	11,831	96.0%	100.0%	11,831
Containers - Aseptic	Recyclable	0.0			*Not Found*					100.0%	0
Plastic bottles	Recyclable	0.8	1.2%	151	0.3	0.7%	65	216	69.8%	100.0%	216
Plastic containers	Recyclable	0.2	0.3%	32	1.5	3.9%	365	398	8.1%	100.0%	398
Plastic film	Refuse	0.4	0.6%	76	0.0	0.0%	0	76		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.2	0.4%	37	37		0.0%	
Glass bottles/jars	Recyclable	0.0			*Not Found*					100.0%	0
Alum&steel cans/foils/trays	Recyclable	0.1	0.1%	16	0.1	0.4%	34	50	32.2%	100.0%	50
Other metal	Recyclable	0.0			*Not Found*					100.0%	0
Food waste	Compostable	0.1	0.2%	23	4.6	12.2%	1,146	1,169	0.0%	100.0%	1,169
Comp.products/low-grade paper	Compostable	0.1	0.2%	23	5.6	14.8%	1,381	1,405	0.0%	100.0%	1,405
Yard waste/green waste	Compostable	0.0			*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable	0.0			*Not Found*					100.0%	0
C&D debris	Refuse	0.0	0.0%	0	18.3	48.5%	4,541	4,541		0.0%	
Items illegal to throw away	Refuse	0.0	0.0%	0	0.1	0.1%	12	12		0.0%	
Trash	Refuse	0.3	0.4%	53	4.9	12.9%	1,211	1,264		0.0%	
Liquids	Refuse	1.0	1.5%	190	0.3	0.9%	81	270		0.0%	
Reusable items	Recyclable	1.0	1.5%	185	0.1	0.1%	12	198	0.0%	100.0%	198
TOTALS		76.9	**100.0%**	**12,480**	19.0	**100.0%**	**9,360**	**21,840**	**57.1%**	**71.6%**	**15,639**
Recyclable		*65.4*	*97.1%*	*12,114*	*3.8*	*10.2%*	*951*	*13,065*	92.7%		
Compostable		*0.3*	*0.4%*	*46*	*10.2*	*27.0%*	*2,527*	*2,574*	0.0%		
Refuse		*1.7*	*2.6%*	*320*							

APPENDIX H – INVER GROVE HEIGHTS CITY HALL

H1. WASTE GENERATION

MSW Consultants deployed to the Inver Grove Heights City Hall on February 13, 2017 to sort trash and recycling that had been set aside from previous days by city staff. No issues were encountered during the activity and the city was very accommodating for the project.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table 1 estimates the annual generation of each of the material streams identified in the audit. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility currently recycles almost 50% of the waste generated.

Table 1 Inver Grove Heights City Hall Annual Waste Generation

Material Stream	Container Size/ Amount Generated	Weekly Collection Frequency	Accumulation Time	Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	59.4 lbs	N/A	2 days	N/A	7,722	50.2%
Recycling	59.0 lbs	N/A	2 days	N/A	7,670	49.8%
Total					**15,392**	**100.0%**

H2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the Inver Grove Heights City Hall are presented in Exhibit 1 at the end of this facility section.

This exhibit contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for the Inver Grove Heights City Hall was found to be 70%. This table also shows the aggregate Recycling Rate of 49.8%, as reported above.

Figure 1 shows the composition of the Trash material stream. As summarized in Exhibit 1, 37.8% of the materials sorted from the trash stream were Recyclable and 43.2% were Compostable.

Figure 1 Inver Grove Heights City Hall Trash Stream Composition Summary

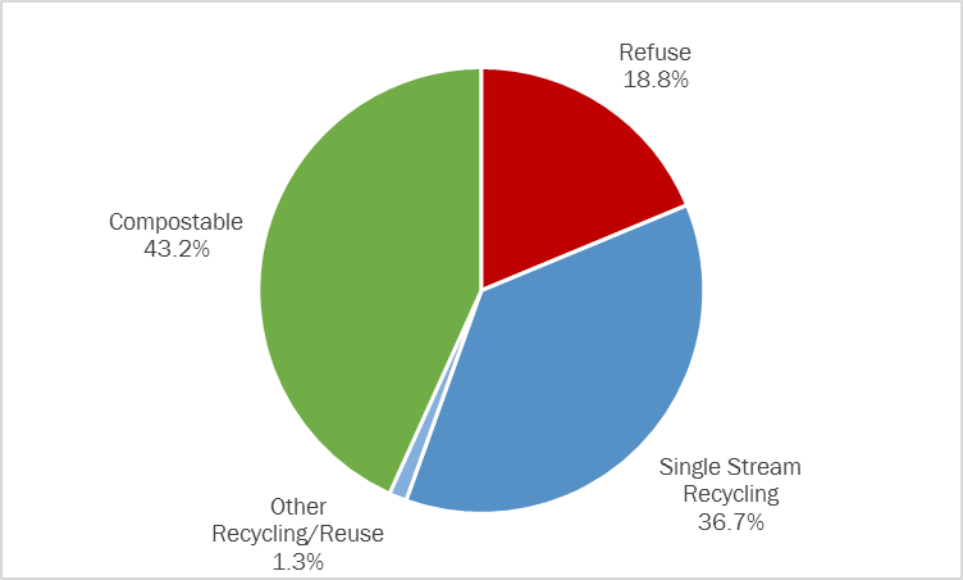
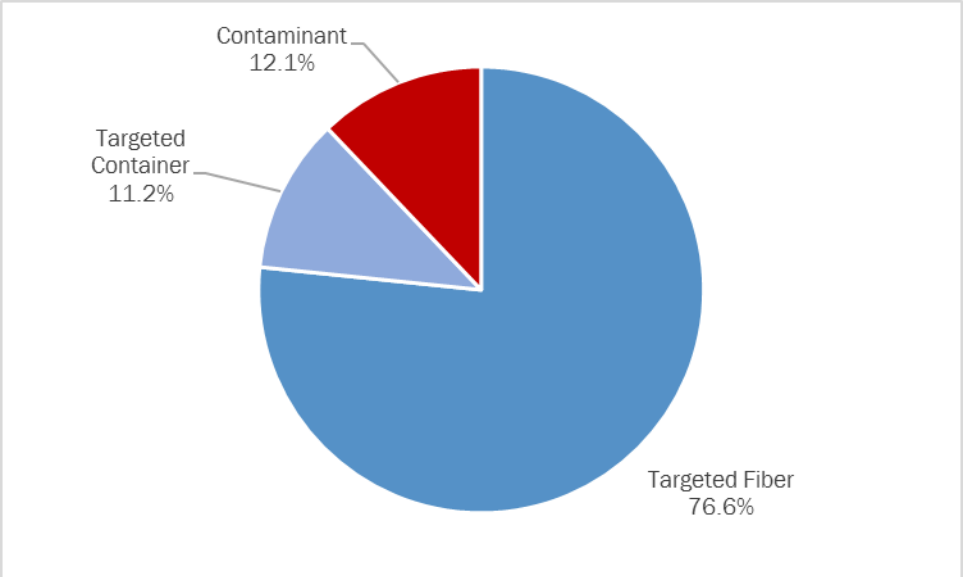


Figure 2 shows the breakdown of Recycling collected. As shown, Targeted Fiber was the majority of the material at 76.6%.

Figure 2 Inver Grove Heights City Hall Recycling Stream Composition Summary



H3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- City interest in Organics collection is substantiated by the amounts of Organics identified in the Trash stream. Over 43% of the Trash could potentially be diverted by implementing an Organics collection program. Educational efforts are deemed effective by the cleanliness of the Recycling stream, so that aspect of an Organics program should not be daunting as long as the Organics hauler is available for the service.
- Capture rates were very high for corrugated cardboard but there is still opportunity for improvement with other targeted recyclable materials.

- Contamination in the Recycling stream was meaningful, and included a fluorescent bulb and batteries among other contaminants. Whereas there may be recycling programs for bulbs/batteries, they are typically collected through hazardous material management systems rather than commingled with the basic recyclables.
- Several file folders (Reusable items) were found in the Recycling stream and file folders as well as a midsize Rubbermaid-type container were found in the Trash sort. These could be reused in the office or donated to others (schools, nonprofit organizations, etc.) for reuse.
- The Trash sample contained many small, desk-side type bags. Most contained recyclables along with food waste and trash items. This is typical of providing desk-side trash containers without desk-side recycling containers. Some entities, including the State of Minnesota Administrative Services, have provided desk-side recycling containers and eliminated desk-side trash containers, instead having a central trash container in each functional area. This has improved awareness of trash generation, and diverted recyclable materials from the trash.
- The maximum potential diversion rate was determined to be 87%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

H4. PHOTO JOURNAL

Sorting location

City Hall

Trash Accumulation Sorted

Recycling Accumulation Sorted

Net Compostables Sorted from Trash

Net Recyclables from both Trash and Recycling Sort

Exhibit H1 - Inver Grove Heights City Hall Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	4.3	7.3%	561	0.5	0.8%	60	621	90.3%	100.0%	621
Mixed recyclable paper	Recyclable	40.9	69.3%	5,317	14.2	23.9%	1,848	7,165	74.2%	100.0%	7,165
Containers - Aseptic	Recyclable				*Not Found*					100.0%	0
Plastic bottles	Recyclable	3.7	6.2%	476	2.0	3.3%	255	731	65.1%	100.0%	731
Plastic containers	Recyclable	0.2	0.3%	23	1.8	3.1%	237	260	8.7%	100.0%	260
Plastic film	Refuse	1.2	2.1%	158	5.6	9.5%	731	889		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.2	0.3%	26	26		0.0%	
Glass bottles/jars	Recyclable	2.0	3.4%	262	2.0	3.3%	255	517	50.6%	100.0%	517
Alum&steel cans/foils/trays	Recyclable	0.8	1.3%	102	1.2	2.1%	161	263	38.9%	100.0%	263
Other metal	Recyclable	0.1	0.2%	15	0.0	0.0%	0	15	100.0%	100.0%	15
Food waste	Compostable	0.4	0.6%	49	10.8	18.2%	1,407	1,456	0.0%	100.0%	1,456
Comp.products/low-grade paper	Compostable	2.2	3.8%	289	14.9	25.0%	1,931	2,220	0.0%	100.0%	2,220
Yard waste/green waste	Compostable				*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*					100.0%	0
C&D debris	Refuse				*Not Found*					0.0%	
Items illegal to throw away	Refuse	0.5	0.8%	65	0.0	0.0%	0	65		0.0%	
Trash	Refuse	0.3	0.6%	44	3.3	5.5%	427	471		0.0%	
Liquids	Refuse	2.1	3.5%	270	2.0	3.4%	263	533		0.0%	
Reusable items	Recyclable	0.3	0.5%	41	0.8	1.3%	99	140	29.1%	100.0%	140
TOTALS		59.0	**100.0%**	**7,670**	59.4	**99.7%**	**7,722**	**15,392**	**49.8%**	**87.0%**	**13,387**
Recyclable		*52.3*	*88.6%*	*6,796*	*22.4*	*37.8%*	*2,915*	*9,711*	70.0%		
Compostable		*2.6*	*4.4%*	*338*	*25.7*	*43.2%*	*3,338*	*3,676*	0.0%		
Refuse		*4.1*	*7.0%*	*536*							

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APPENDIX I – LAKEVILLE CITY HALL

I1. WASTE GENERATION

MSW Consultants deployed to the City of Lakeville Maintenance Facility on February 6, 2017 to sort City Hall trash and recycling that had been set aside from previous days by city staff. No issues were encountered during the activity and the city was very accommodating for the project.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table I1 estimates the annual generation of each of the material streams identified in the audit. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility currently recycles slightly over 47% of the waste generated.

Table I1 Lakeville City Hall Annual Waste Generation

Material Stream	Container Size/ Amount Generated	Weekly Collection Frequency	Accumulation Time	Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	3.0 yd	1	2 days	90	14,040	52.9%
Recycling	2.0 yd	1	2 days	120	12,480	47.1%
Total					**26,520**	**100.0%**

I2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the Lakeville City Hall are presented in Exhibit I1 at the end of this facility section.

This exhibit contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for Lakeville City Hall was found to be 71.1%. This table also shows the aggregate Recycling Rate of 47.1%, as reported above.

Figure I1 shows the composition of the Trash material stream. As summarized in Exhibit I1, 34.9% of the materials sorted from the trash stream were Recyclable and 48.7% were Compostable.

Figure I1 Lakeville City Hall Trash Stream Composition Summary

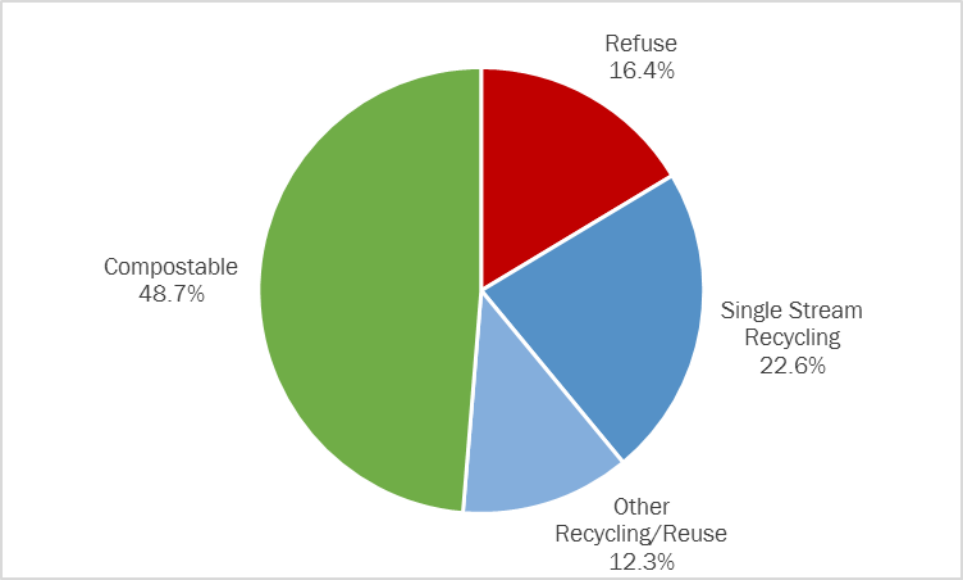
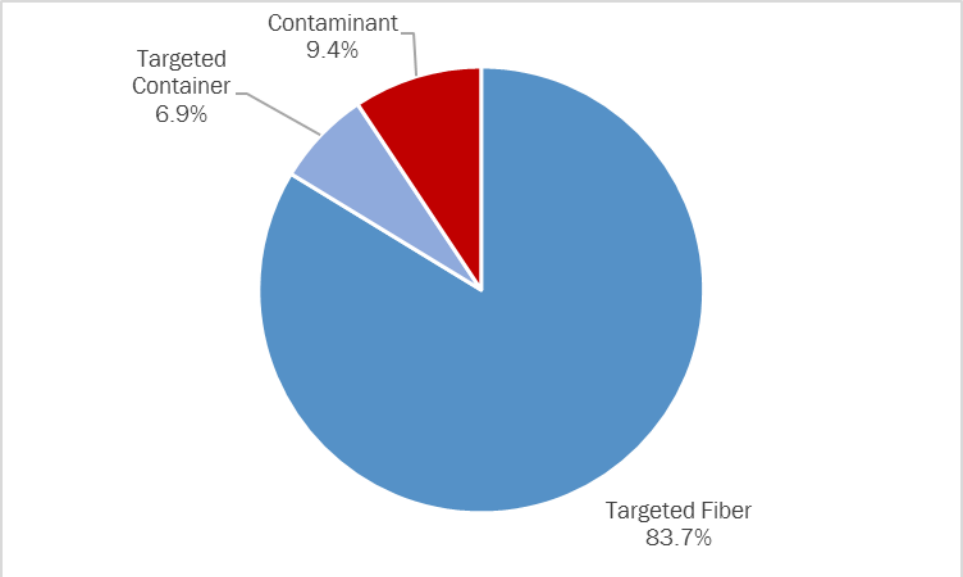


Figure I2 shows the breakdown of Recycling collected. As shown, Targeted Fiber was the majority of the material at 83.7%.

Figure I2 Lakeville City Hall Recycling Stream Composition Summary



I3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- Contamination in the recycling stream is at the high end of the desirable range and should be monitored to make sure it does not increase further. Contaminations included food waste, food wrappers and non-recyclable paper.
- File folders are typically reusable, either within an organization or by donating them to teachers or non-profit organizations, etc.

- Paper towels and candy wrappers should not be stuffed in food or beverage containers before placing them in recycling. Many tissues and napkins are compostable, some are not. Food wrappers typically are not compostable.
- Batteries are typically recyclable. Batteries found during the sort activity were turned over to Recycling staff to handle.
- The maximum potential diversion rate was determined to be 90.2%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

I4. PHOTO JOURNAL

Sorting Location

Maintenance Facility

Trash Accumulation Sorted

Sorting Setup

Toner Cartridge Found in Trash

Placed in Reusable category, as there are take-back programs that refill and reuse them.

Exhibit I1 - Lakeville City Hall Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	4.0	7.7%	957	0.6	2.2%	303	1,259	76.0%	100.0%	1,259
Mixed recyclable paper	Recyclable	39.3	76.0%	9,490	2.7	10.2%	1,433	10,923	86.9%	100.0%	10,923
Containers - Aseptic	Recyclable				*Not Found*					100.0%	0
Plastic bottles	Recyclable	0.5	1.0%	124	0.2	0.8%	114	238	52.0%	100.0%	238
Plastic containers	Recyclable	0.6	1.1%	139	2.1	8.1%	1,144	1,282	10.8%	100.0%	1,282
Plastic film	Refuse	0.9	1.8%	220	0.2	0.8%	114	335		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.1	0.4%	54	54		0.0%	
Glass bottles/jars	Recyclable	1.2	2.3%	293	0.0	0.0%	0	293	100.0%	100.0%	293
Alum&steel cans/foils/trays	Recyclable	1.3	2.5%	311	0.3	1.3%	182	492	63.1%	100.0%	492
Other metal	Recyclable				*Not Found*					100.0%	0
Food waste	Compostable	0.3	0.5%	66	5.2	19.8%	2,785	2,852	0.0%	100.0%	2,852
Comp.products/low-grade paper	Compostable	0.1	0.2%	30	7.0	26.7%	3,754	3,784	0.0%	100.0%	3,784
Yard waste/green waste	Compostable	0.0	0.0%	0	0.6	2.1%	296	296	0.0%	100.0%	296
Wood pallets/clean wood	Compostable	0.0			*Not Found*					100.0%	0
C&D debris	Refuse	0.0	0.0%	0	0.2	0.9%	121	121		0.0%	
Items illegal to throw away	Refuse	0.0	0.0%	0	1.6	6.1%	861	861		0.0%	
Trash	Refuse	0.1	0.3%	33	2.1	8.2%	1,150	1,184		0.0%	
Liquids	Refuse	0.2	0.4%	54	0.0	0.0%	0	54		0.0%	
Reusable items	Recyclable	3.2	6.1%	763	3.2	12.3%	1,729	2,492	30.6%	100.0%	2,492
TOTALS		51.7	**100.0%**	**12,480**	26.1	**100.0%**	**14,040**	**26,520**	**47.1%**	**90.2%**	**23,911**
Recyclable		*50.0*	*96.8%*	*12,076*	*9.1*	*34.9%*	*4,904*	*16,980*	71.1%		
Compostable		*0.4*	*0.8%*	*97*	*12.7*	*48.7%*	*6,835*	*6,932*	0.0%		
Refuse		*1.3*	*2.5%*	*308*							

APPENDIX J – MENDOTA HEIGHTS CITY HALL

J1. WASTE GENERATION

MSW Consultants deployed to the Mendota Heights City Hall on February 13, 2017 to sort trash and recycling that had been set aside from previous days by city staff. No issues were encountered during the sorting activity and the city was very accommodating for the project.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table J1 estimates the annual generation of each of the material streams identified in the sort. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility currently recycles a bit over 93% of the waste generated.

Table J1 Mendota Heights City Hall Annual Waste Generation

Material Stream	Container Size/ Amount Generated	Weekly Collection Frequency	Accumulation Time	Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	10.4 lbs	N/A	2 days	N/A	1,358	7.0%
Recycling	138.9 lbs	N/A	2 days	N/A	18,051	93.0%
Total					**19,408**	**100.0%**

J2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the Mendota Heights City Hall are presented in Exhibit J1 at the end of this facility section.

This exhibit contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for Mendota Heights City Hall was found to be 98.8%, which reflects excellent recycling participation and capture. This table also shows the aggregate Recycling Rate of 93%, as reported above, which is phenomenal.

Figure J1 shows the composition of the Trash material stream. As summarized in Exhibit J1, 15.9% of the materials sorted from the trash stream were Recyclable and 64.2% were Compostable.

Figure J1 Mendota Heights City Hall Trash Stream Composition Summary

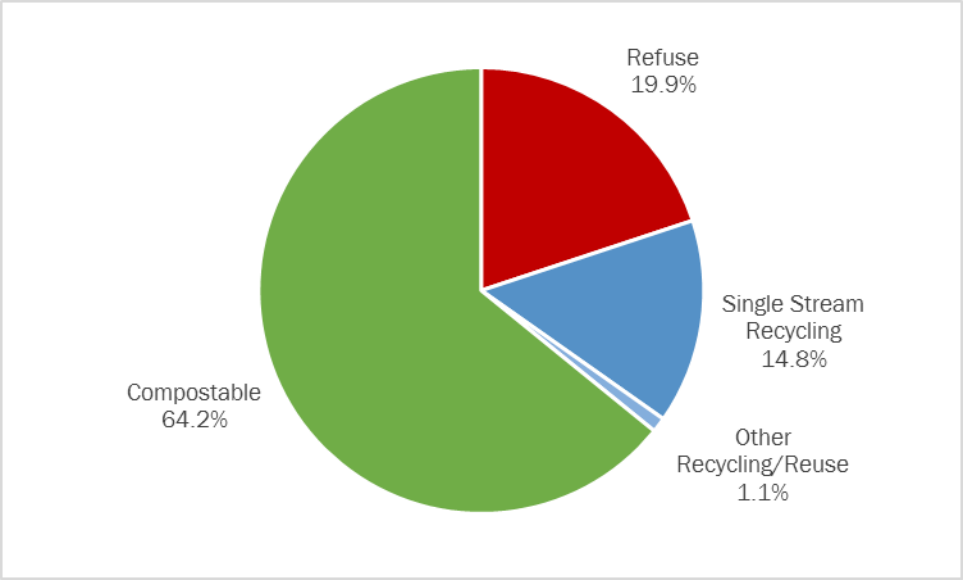
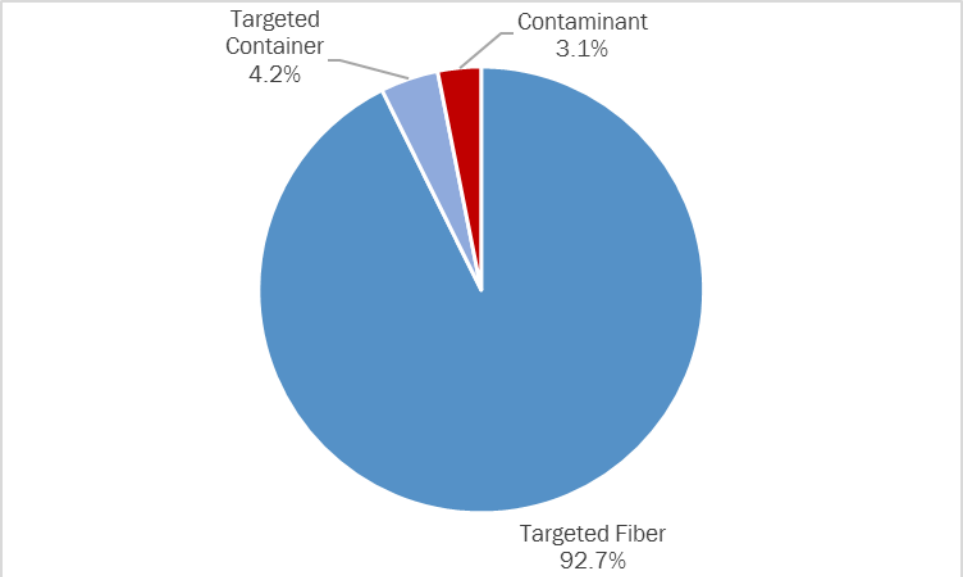


Figure J2 shows the breakdown of Recycling collected. As shown, Targeted Fiber was the vast majority of the material at 92.7%.

Figure J2 Mendota Heights City Hall Recycling Stream Composition Summary



J3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- Until and unless this facility initiates a diversion program for food wastes, the current recycling program should be considered to be performing at the highest level (assuming this sort captured a representative snapshot).
- The Recycling stream contained several items that could be improved with further education. There was a substantial amount of utility stub cleanout, with clipped and banded bundles. The stubs are recyclable, but rubber bands and paper clips should be removed for reuse prior to disposal of the stubs. Several file folders were also extracted for the Reusable category. Two types of ammunition

boxes were common in the recyclables. The components are recyclable, but should be separated prior to discarding. (see photos)

- A cool-weather headband was sorted from the Trash and classified as Reusable.
- It was noted that very little food waste was in the Trash and Recycling samples. The compostable material was predominantly napkins and tissues. If an Organics collection program were to be implemented, possibly 64% more of the Trash stream could be diverted.
- The maximum potential diversion rate was determined to be 97.4%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

J4. PHOTO JOURNAL

Sorting Location

City Hall

Trash Accumulation Sorted

Recycling Accumulation Sorted

Training Opportunity from Recycling Sort

Ammunition boxes – recyclable components (chipboard-expanded polystyrene and chipboard-plastic).

Educational Opportunity from Recycling Sort

Papers should be separated from paperclips, rubber bands and file folders before discarding.

Sorting Activity Setup

Sort set-up.

Exhibit J1 - Mendota Heights City Hall Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	3.2	2.3%	418	0.2	2.0%	28	445	93.8%	100.0%	445
Mixed recyclable paper	Recyclable	125.4	90.3%	16,307	0.6	5.9%	80	16,387	99.5%	100.0%	16,387
Containers - Aseptic	Recyclable				*Not Found*					100.0%	0
Plastic bottles	Recyclable	1.4	1.0%	177	0.0	0.1%	2	179	99.1%	100.0%	179
Plastic containers	Recyclable	0.8	0.6%	101	0.6	6.0%	81	182	55.4%	100.0%	182
Plastic film	Refuse	1.1	0.8%	138	1.2	11.6%	158	296		0.0%	
Expanded polystyrene	Refuse	0.3	0.2%	33	0.1	1.0%	13	46		0.0%	
Glass bottles/jars	Recyclable	3.0	2.1%	385	0.0	0.0%	0	385	100.0%	100.0%	385
Alum&steel cans/foils/trays	Recyclable	0.7	0.5%	96	0.1	0.8%	11	107	89.4%	100.0%	107
Other metal	Recyclable				*Not Found*					100.0%	0
Food waste	Compostable	0.1	0.1%	16	3.4	32.3%	439	455	0.0%	100.0%	455
Comp.products/low-grade paper	Compostable	0.3	0.2%	36	3.3	31.8%	432	468	0.0%	100.0%	468
Yard waste/green waste	Compostable				*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*					100.0%	0
C&D debris	Refuse				*Not Found*					0.0%	
Items illegal to throw away	Refuse				*Not Found*					0.0%	
Trash	Refuse	0.5	0.4%	70	0.8	7.3%	100	170		0.0%	
Liquids	Refuse				*Not Found*					0.0%	
Reusable items	Recyclable	2.1	1.5%	275	0.1	1.1%	15	289	94.9%	100.0%	289
TOTALS		138.9	**100.0%**	**18,051**	10.4	**100.0%**	**1,358**	**19,408**	**93.0%**	**97.4%**	**18,897**
Recyclable		*136.6*	*98.4%*	*17,758*	*1.7*	*15.9%*	*216*	*17,974*	98.8%		
Compostable		*0.4*	*0.3%*	*52*	*6.7*	*64.2%*	*871*	*923*	0.0%		
Refuse		*1.9*	*1.3%*	*241*							

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APPENDIX K – ROSEMOUNT CITY HALL

K1. WASTE GENERATION

MSW Consultants deployed to the Rosemount City Hall on February 9, 2017 to sort trash and recycling that had been set aside from previous days by city staff. No issues were encountered during the sorting activity and the city was very accommodating for the project.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table K1 estimates the annual generation of each of the material streams identified in the sort. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility currently recycles 20% of the total waste generated.

Table K1 Rosemount City Hall Annual Waste Generation

Material Stream	Container Size/ Amount Generated	Weekly Collection Frequency	Accumulation Time	Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	4.0 yd	1	2 days	90	18,720	80.0%
Recycling	0.8 yd	1	2 days	120	4,680	20.0%
Total					**23,400**	**100.0%**

K2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the Rosemount City Hall are presented in Exhibit K1 at the end of this facility section.

This exhibit contains several important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for Rosemount City Hall was found to be 35.5%. This table also shows the aggregate Recycling Rate of 20.0%, as reported above.

Figure K1 shows the composition of the Trash material stream. As summarized in Exhibit K1, 45.2% of the materials sorted from the trash stream were Recyclable and 29.8% were Compostable.

Figure K1 Rosemount City Hall Trash Stream Composition Summary

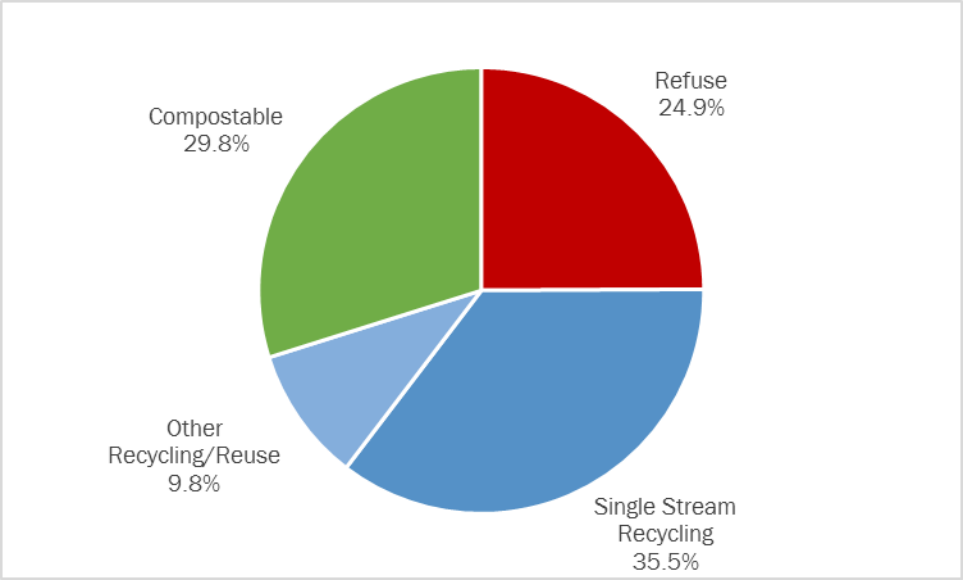
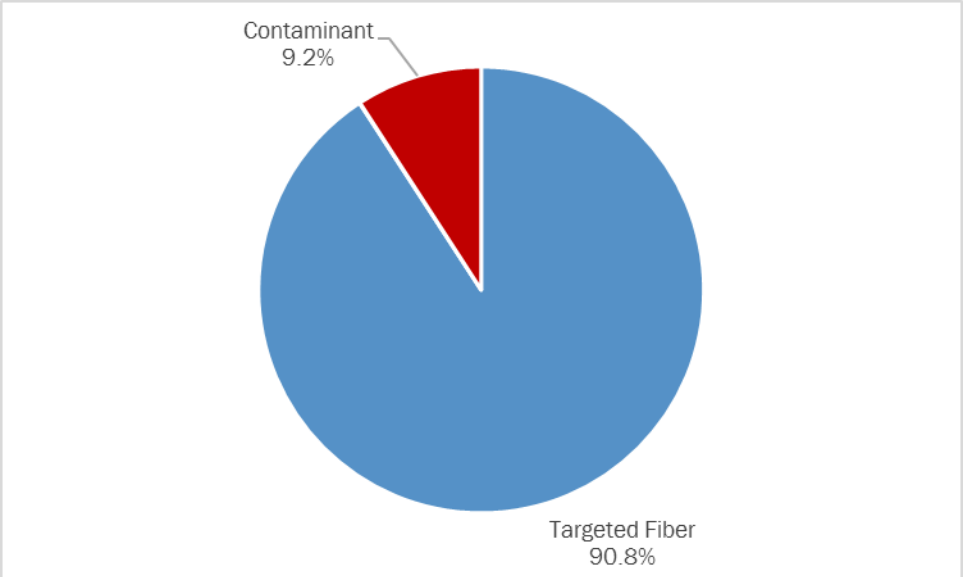


Figure K2 shows the breakdown of Recycling collected. As shown, virtually all of the recyclables (90.8%) were Targeted Fiber, with only a trace amount of recyclable containers (not shown in pie chart).

Figure K2 Rosemount City Hall Recycling Stream Composition Summary



K3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- The capture rates for targeted recyclables could be improved at this location. Capture rates should be targeted at 80%, from the current 36%. The recyclables indicate that education of staff, rather than of members of the public that use the facility, should be targeted.
- Contamination is at the higher end of the desirable range. The quality of recyclables should be monitored to keep contamination manageable.
- There is an opportunity to significantly increase diversion if it becomes possible to divert food wastes and compostable papers to an organics collection service.

- Several items targeted for identification as Reusable Items for the purpose of this study were identified, many indicating an office cleanout. MSW staff communicated the findings to city staff on site.
- A few confidential items, assumedly from the Police Department, were discovered and turned over to city staff to handle. Because the trash is in an unsecured area, it is important that these items are securely destroyed, to protect chain-of-custody for the Department, and to avoid these materials ending up on the street.
- The maximum potential diversion rate was determined to be 80%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

K4. PHOTO JOURNAL

Sorting Location

City Hall

Trash Accumulation Sorted

Recycling Accumulation Sorted

Recycling Accumulation Sorted

Recycling Accumulation Sorted

Reusable Items Found in Trash Sorted

Many items from an apparent office cleanout: frames, bookshelf dividers, water bottles, binders, folders, office supplies and recyclable paper.

Reusable Items Found in Trash sorted

Folders and partially used toilet paper rolls.

Exhibit K1 - Rosemount City Hall Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	9.4	8.8%	414	2.2	1.6%	301	715	57.8%	100.0%	715
Mixed recyclable paper	Recyclable	87.2	82.0%	3,836	37.0	27.6%	5,162	8,998	42.6%	100.0%	8,998
Containers - Aseptic	Recyclable	0.0	0.0%	0	0.2	0.2%	30	30	0.0%	100.0%	30
Plastic bottles	Recyclable	0.0	0.0%	0	1.9	1.4%	267	267	0.0%	100.0%	267
Plastic containers	Recyclable	0.0	0.0%	0	3.5	2.6%	491	491	0.0%	100.0%	491
Plastic film	Refuse	0.2	0.2%	9	7.1	5.3%	988	997		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.3	0.2%	42	42		0.0%	
Glass bottles/jars	Recyclable	0.0	0.0%	0	1.3	1.0%	183	183	0.0%	100.0%	183
Alum&steel cans/foils/trays	Recyclable	0.0	0.0%	2	1.5	1.1%	207	209	0.8%	100.0%	209
Other metal	Recyclable				*Not Found*					100.0%	0
Food waste	Compostable	0.0	0.0%	0	20.3	15.1%	2,827	2,827	0.0%	100.0%	2,827
Comp.products/low-grade paper	Compostable	0.0	0.0%	1	19.8	14.7%	2,760	2,762	0.0%	100.0%	2,762
Yard waste/green waste	Compostable				*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*					100.0%	0
C&D debris	Refuse				*Not Found*					0.0%	
Items illegal to throw away	Refuse				*Not Found*					0.0%	
Trash	Refuse	0.0	0.0%	0	24.5	18.2%	3,414	3,414		0.0%	
Liquids	Refuse	0.0	0.0%	0	1.6	1.2%	220	220		0.0%	
Reusable items	Recyclable	9.5	8.9%	418	13.1	9.8%	1,828	2,247	18.6%	100.0%	2,247
TOTALS		106.4	**100.0%**	**4,680**	134.3	**100.0%**	**18,720**	**23,400**	**20.0%**	**80.0%**	**18,727**
Recyclable		*106.1*	*99.8%*	*4,670*	*60.8*	*45.2%*	*8,469*	*13,139*	35.5%		
Compostable		*0.0*	*0.0%*	*1*	*40.1*	*29.8%*	*5,587*	*5,588*	0.0%		
Refuse		*0.2*	*0.2%*	*9*							

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APPENDIX L – SOUTH ST. PAUL CITY HALL

L1. WASTE GENERATION

MSW Consultants deployed to the South St. Paul City Hall on February 10, 2017 to sort trash and recycling that had been set aside from previous days by city staff. Based on input from the facility staff, it was determined that the material to be sorted represented six days of accumulated trash. MSW Consultants characterized a portion of this accumulation (estimated at 3 days' worth), and also sorted accumulated recyclables.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table L1 estimates the annual generation of each of the material streams identified in the sort. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility currently recycles 40% of the total waste generated.

Table L1 South St. Paul City Hall Annual Waste Generation

Material Stream	Container Size/ Amount Generated	Weekly Collection Frequency	Accumulation Time	Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	10.0 yd	2	2 days	90	93,600	60.0%
Recycling	10.0 yd	1	2 days	120	62,400	40.0%
Total					**156,000**	**100.0%**

L2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the South St. Paul City Hall are presented in Exhibit L1 at the end of this facility section.

This exhibit contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for the South St. Paul City Hall was found to be 72.5%. This table also shows the aggregate Recycling Rate of 40%, as reported above.

Figure L1 shows the composition of the Trash material stream. As summarized in Exhibit L1, 23.1% of the materials sorted from the trash stream were Recyclable and 36.5% were Compostable.

Figure L1 South St. Paul City Hall Trash Stream Composition Summary

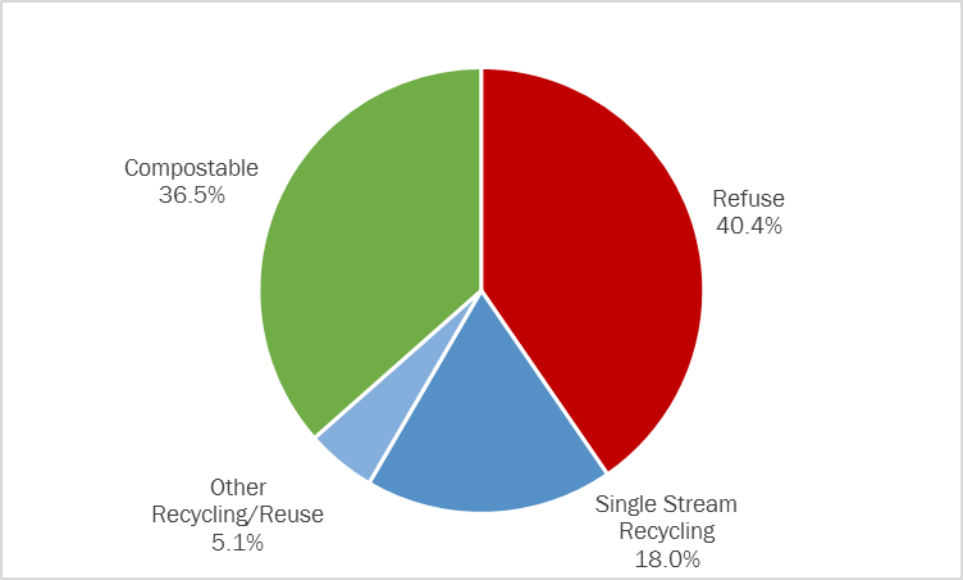
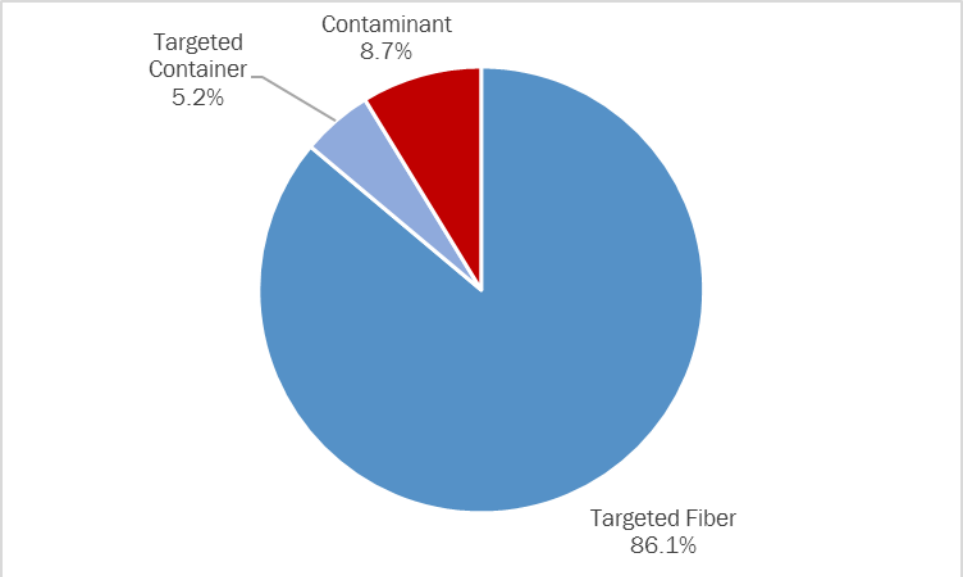


Figure L2 shows the breakdown of Recyclables collected. As shown, Targeted Fiber was the vast majority of the material at 86.1%.

Figure L2 South St. Paul City Hall Recycling Stream Composition Summary



L3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- Capture rates for OCC and recyclable papers are very high, but drop off slightly for recyclable containers.
- Several pallets had been cut in half and thrown in the Trash dumpster. The city was following up with surveillance in efforts to determine the source, assumed to be illegally dumped there. The impact of these items has been retained in the results, and may not be entirely representative of the waste generated at this site. The trash dumpster area is on a busy street, and is unsecured, making it a target for illegal dumping activity.

- A large volume of VCR tapes and training materials appearing to have originated from Police or Fire Departments were found in the Trash.
- A coil of plastic coated metal wiring was in the recycling. Other than that, the recycling stream was relatively clean.
- Several items identified in the trash sample should be managed as special wastes rather than disposed, including an oil filter, computer mouse, adapter plugs, and alkaline batteries.
- The maximum potential diversion rate was determined to be 72.3%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

L4. PHOTO JOURNAL

Sorting Location

City Hall

Trash Accumulation Sorted

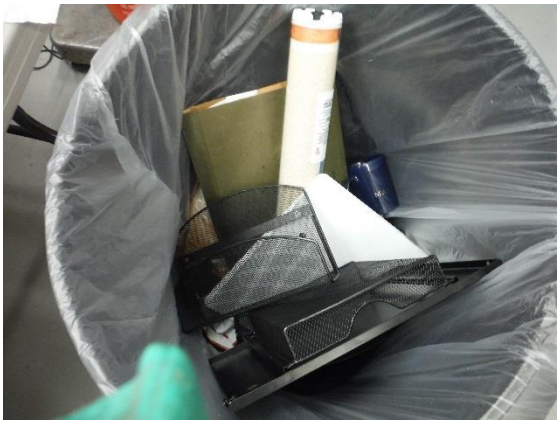
Recycling Accumulation Sorted

Recycling Accumulation Sorted

Pallets located in Trash Dumpster

City staff suspected these had been illegally dumped and were investigating through surveillance recordings.

Reusable Items Found in Trash Sorted



Many items from apparent office cleanout: desktop organizer, hanging folders, water bottles, binders, office supplies, clothes and refillable/returnable toner cartridges.

Exhibit L1 - South St. Paul City Hall Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	17.1	23.3%	14,544	4.0	1.4%	1,337	15,880	91.6%	100.0%	15,880
Mixed recyclable paper	Recyclable	46.0	62.8%	39,184	31.5	11.2%	10,486	49,670	78.9%	100.0%	49,670
Containers - Aseptic	Recyclable	0.0	0.0%	0	0.5	0.2%	154	154	0.0%	100.0%	154
Plastic bottles	Recyclable	1.1	1.5%	948	5.2	1.8%	1,724	2,672	35.5%	100.0%	2,672
Plastic containers	Recyclable	0.3	0.4%	277	3.9	1.4%	1,299	1,576	17.6%	100.0%	1,576
Plastic film	Refuse	0.6	0.8%	522	13.4	4.8%	4,477	4,999		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	1.4	0.5%	450	450		0.0%	
Glass bottles/jars	Recyclable				*Not Found*					100.0%	
Alum&steel cans/foils/trays	Recyclable	2.3	3.2%	1,992	5.6	2.0%	1,857	3,850	51.8%	100.0%	3,850
Other metal	Recyclable	0.0	0.0%	0	1.2	0.4%	404	404	0.0%	100.0%	404
Food waste	Compostable	0.0	0.0%	0	34.7	12.3%	11,552	11,552	0.0%	100.0%	11,552
Comp.products/low-grade paper	Compostable	0.1	0.1%	64	32.8	11.7%	10,919	10,983	0.0%	100.0%	10,983
Yard waste/green waste	Compostable				*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable	0.0	0.0%	0	35.1	12.5%	11,694	11,694	0.0%	100.0%	11,694
C&D debris	Refuse	0.0	0.0%	0	4.4	1.6%	1,474	1,474		0.0%	
Items illegal to throw away	Refuse	0.0	0.0%	0	0.9	0.3%	300	300		0.0%	
Trash	Refuse	4.0	5.4%	3,399	80.0	28.5%	26,657	30,055		0.0%	
Liquids	Refuse	1.7	2.4%	1,470	13.4	4.8%	4,464	5,935		0.0%	
Reusable items	Recyclable	0.0	0.0%	0	13.1	4.6%	4,352	4,352	0.0%	100.0%	4,352
TOTALS		73.2	**100.0%**	**62,400**	280.9	**100.0%**	**93,600**	**156,000**	**40.0%**	**72.3%**	**112,787**
Recyclable		*66.8*	*91.3%*	*56,945*	*64.9*	*23.1%*	*21,613*	*78,558*	72.5%		
Compostable		*0.1*	*0.1%*	*64*	*102.5*	*36.5%*	*34,165*	*34,229*	0.0%		
Refuse		*6.3*	*8.6%*	*5,391*							

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APPENDIX M – WEST ST. PAUL CITY HALL

M1. WASTE GENERATION

MSW Consultants deployed to the West St. Paul City Hall on February 10, 2017 to sort trash and recycling that had been set aside from previous days by city staff. No issues were encountered during the sorting activity and the city was very accommodating for the project.

Annual generation of wastes and recyclables at this location has been projected based on current service levels and/or extrapolating annual volumes from the quantities that accumulated prior to this activity. Table M1 estimates the annual generation of each of the material streams identified in the waste sort. For material streams where the collection service level is known, the annual generation has been estimated based on average container density. For material streams with intermittent or unknown service levels, annual quantities were estimated based on the accumulation rate found during the sort. As shown, the facility currently recycles 48% of the total waste generated.

Table M1 West St. Paul City Hall Annual Waste Generation

Material Stream	Container Size/ Amount Generated		Weekly Collection Frequency	Accumulation Time		Density (lbs/CY)	Estimated Annual Quantity (lbs)	Percent of Total
Trash	92.6	lbs	N/A	2	days	N/A	12,035	52.0%
Recycling	85.3	lbs	N/A	2	days	N/A	11,087	48.0%
Total							**23,122**	**100.0%**

M2. WASTE SORT RESULTS

The detailed results of the waste and recycling sort for the West St. Paul City Hall are presented in Exhibit M1 at the end of this facility section.

This exhibit contains multiple important data points. First, the table applies the results of the disposed waste composition analysis to identify the constituents found in the disposed waste stream. Second, the table indicates the "Recycling Rate," the rate at which recyclables are being diverted, and at what annual quantity. Finally, the table reports the "Capture Rate." The Capture Rate is defined as the percentage of each material that is targeted for recycling that actually gets properly recycled. High Capture Rates suggest the facility staff are aware of and actively using recycling programs. Lower Capture Rates suggest there may be opportunities for improvement. The Capture Rate for all targeted recyclables for West St. Paul City Hall was found to be 63%. This table also shows the aggregate Recycling Rate of 48%, as reported above.

Figure M1 shows the composition of the Trash material stream. As summarized in Exhibit M1, 47.7% of the materials sorted from the trash stream were Recyclable and 27% were Compostable.

Figure M1 West St. Paul City Hall Trash Stream Composition Summary

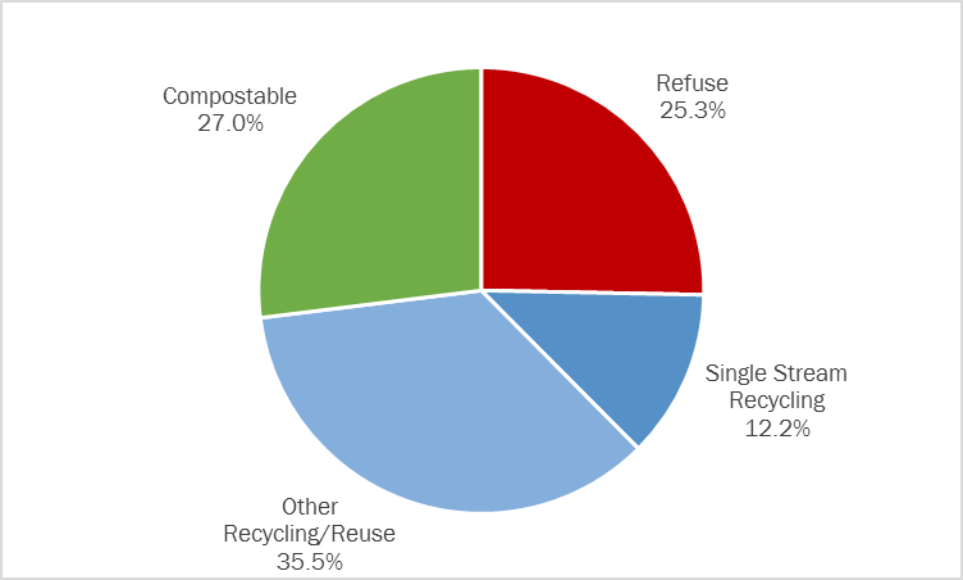
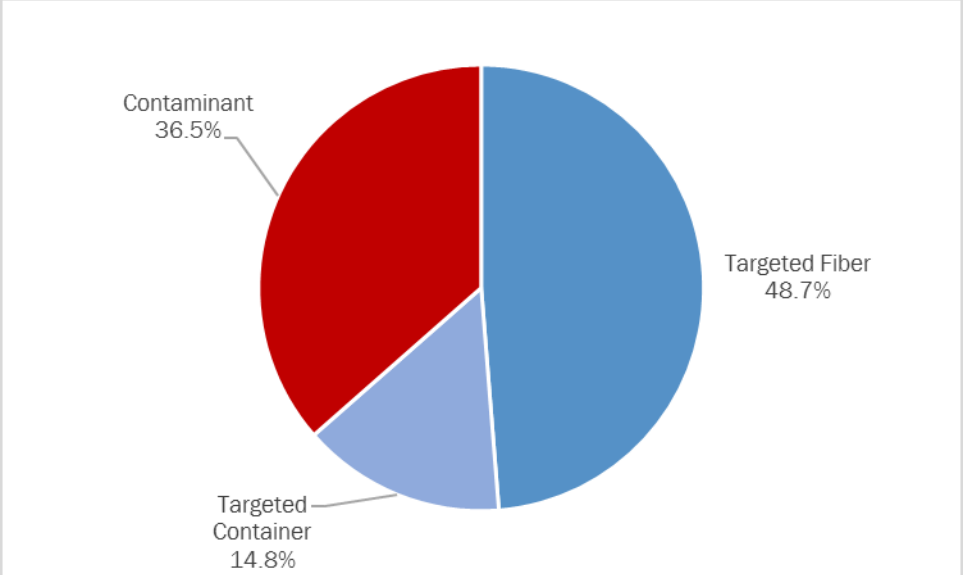


Figure M2 shows the breakdown of Recycling collected. As shown, 36.5% fell into the Contaminant category, with over 20% being in the Reusable subcategory.

Figure M2 West St. Paul City Hall Recycling Stream Composition Summary



M3. KEY FINDINGS AND EDUCATIONAL/TRAINING SUGGESTIONS

- Capture rates for fiber and containers were high, which suggests good recycling participation.
- A large number of Reusable items were located in the Recycling. Many appeared to be from an office turnover or cleanout. The materials were discussed with and turned over to city staff before departure.
- Illegal items that were in the Recycling included live ammunition. This was recorded for weight and turned over to city staff to handle. Other items illegal to dispose of in the Recycling included a cigarette lighter and alkaline batteries.

- Liquid cleaner and a halogen bulb were found in the trash. These items should be separately managed as special wastes and not included in the regular waste stream.
- Reusable items identified in the Trash sort included a duffle bag, several slate tiles, ear muffs, a winter jacket and cap, a welding glove, and lunch boxes with reusable freezer packs.
- The issues were discussed with city staff and educational targets for particular departments were identified.
- The maximum potential diversion rate was determined to be 82%. This maximum rate could be achieved if every recyclable and compostable (e.g. every bottle, can, piece of paper or food scrap) was correctly recovered and recycled or composted. It is understood that it is difficult to achieve "perfect" recovery and recycling of each commodity.

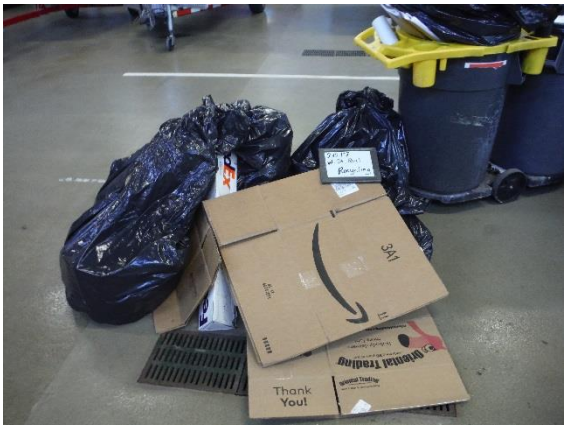
M4. PHOTO JOURNAL

Sorting Location

City Hall

Trash Accumulation Sorted

Recycling Accumulation Sorted

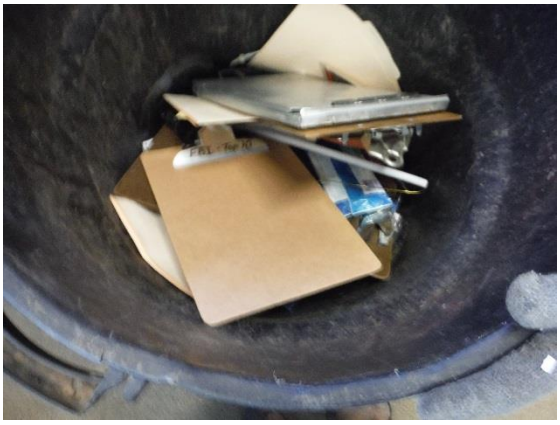


Sorting Area Setup

Reusable Items Found in Trash Sorted

Some of the reusable items found in the trash sort.

Reusable Items Found in Recycling Sorted



Many items from an apparent office cleanout were found in the Recycling sort: office supplies (several unopened or still in the package), locks with keys, unopened hand warmers and crayons in good condition.

Exhibit M1 - West St. Paul City Hall Characterization Summary

		Recycling			Trash			Total		Diversion Potential	
Material Category	Disposition	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Lbs Sorted	Compo-sition	Annual Generation (lbs)	Annual Generation (lbs)	Capture Rate	Max Capture Rate	Max Diversion (lbs)
Corrugated Cardboard	Recyclable	5.9	6.9%	767	1.1	1.1%	138	905	84.7%	100.0%	905
Mixed recyclable paper	Recyclable	35.7	41.8%	4,636	1.9	2.1%	249	4,885	94.9%	100.0%	4,885
Containers - Aseptic	Recyclable	0.0	0.0%	0	0.1	0.1%	8	8	0.0%	100.0%	8
Plastic bottles	Recyclable	2.7	3.1%	346	1.0	1.1%	132	478	72.4%	100.0%	478
Plastic containers	Recyclable	0.8	0.9%	101	5.8	6.2%	751	852	11.8%	100.0%	852
Plastic film	Refuse	2.2	2.5%	281	4.9	5.3%	639	920		0.0%	
Expanded polystyrene	Refuse	0.0	0.0%	0	0.3	0.4%	45	45		0.0%	
Glass bottles/jars	Recyclable	1.4	1.7%	184	0.9	1.0%	119	302	60.8%	100.0%	302
Alum&steel cans/foils/trays	Recyclable	7.8	9.1%	1,011	0.6	0.6%	76	1,087	93.0%	100.0%	1,087
Other metal	Recyclable	3.8	4.4%	489	0.3	0.3%	41	530	92.3%	100.0%	530
Food waste	Compostable	0.0	0.0%	0	12.3	13.3%	1,602	1,602	0.0%	100.0%	1,602
Comp.products/low-grade paper	Compostable	1.5	1.7%	189	12.6	13.6%	1,641	1,830	0.0%	100.0%	1,830
Yard waste/green waste	Compostable				*Not Found*					100.0%	0
Wood pallets/clean wood	Compostable				*Not Found*					100.0%	0
C&D debris	Refuse				*Not Found*					0.0%	
Items illegal to throw away	Refuse	1.5	1.8%	195	1.3	1.4%	163	358		0.0%	
Trash	Refuse	2.7	3.2%	349	15.5	16.8%	2,020	2,369		0.0%	
Liquids	Refuse	2.3	2.7%	302	1.4	1.5%	179	481		0.0%	
Reusable items	Recyclable	17.2	20.2%	2,238	32.6	35.2%	4,233	6,471	34.6%	100.0%	6,471
TOTALS		85.3	**100.0%**	**11,087**	92.6	**100.0%**	**12,035**	**23,122**	**48.0%**	**82.0%**	**18,949**
Recyclable		*75.2*	*88.1%*	*9,771*	*44.2*	*47.7%*	*5,746*	*15,517*	63.0%		
Compostable		*1.5*	*1.7%*	*189*	*24.9*	*27.0%*	*3,243*	*3,432*	0.0%		
Refuse		*8.7*	*10.2%*	*1,128*							