

---

# OCRRA (Onondaga County Resource Recovery Agency)

## Update to Comprehensive Recycling and Market Analysis

June 2014

### **Recent Awards and Recognition Received by OCRRA**

**2011 SWANA Excellence Award, Silver – Composting**

**2011 SWANA Excellence Award, Bronze – Integrated Solid Waste System**

**2011 SWANA Excellence Award, Silver – Marketing**

**2011 American Forestry and Paper Association Award for Community Recycling**

**2011 NYSDEC Environmental Excellence Award for Food Waste Composting Program**

**2011 Waste & Recycling News, Green City Award, Outstanding Residential Recycling**

**2012 Constant Contact Marketing All Star**

**2012 GreeningUSA Advocacy Award**

**2012 SWANA Excellence Award, Gold – Waste-to-Energy (WTE) Facility Operations**

*(Awarded to Covanta Energy, OCRRA's WTE partner)*

**2013 Rechargeable Battery Recycling Corporation (Call2Recycle) Leader in Sustainability Award**

**2013 ARC of Onondaga – Robert D.McAuliffe Community Service Award**

Mark Donnelly, Executive Director  
OCRRA  
100 Elwood Davis Road  
North Syracuse, New York 13212

[www.OCRRA.org](http://www.OCRRA.org)

## Table of Contents

|  |           |
|--|-----------|
| <b>1. EXECUTIVE SUMMARY .....</b>  | <b>1</b>  |
| <b>2. RECYCLING IN ONONDAGA COUNTY.....</b>  | <b>1</b>  |
| 2.1 Current Program.....   | 1         |
| 2.2 2005 Waste Q & C.....  | 4         |
| <b>3. RECENT CHANGES TO THE RECYCLING PROGRAM.....</b>   | <b>5</b>  |
| 3.1 New Additions .....  | 5         |
| 3.2 Material Recovery Facility Changes.....  | 5         |
| 3.3 Program Expansion: Food Waste Composting .....   | 6         |
| 3.4 Program Enhancements.....  | 7         |
| <b>4. COST OF RECYCLING PROGRAMS .....</b>   | <b>11</b> |
| 4.1 Blue Bins.....   | 11        |
| 4.2 Blue Bin Items .....   | 11        |
| 4.3 Costs of Other Selected Programs .....   | 12        |
| <b>5. RECYCLING MARKET TRENDS .....</b>  | <b>14</b> |
| 5.1 Recyclable Markets, 2011-2013 .....  | 14        |
| 5.2 Current Market Outlooks .....  | 16        |
| <b>6. MATERIAL TRENDS AND IMPACTS .....</b>  | <b>16</b> |
| <b>7. EVALUATION OF MATERIALS.....</b>   | <b>17</b> |
| <b>8. CONCLUSION .....</b>   | <b>21</b> |
| <b>APPENDIX 1. 2005 WASTE Q&amp;C: SUMMARY OF DISPOSED MUNICIPAL SOLID WASTE<br/>COMPOSITION .....</b> | <b>23</b> |
| <b>APPENDIX 2. 2005 WASTE Q&amp;C: SUMMARY OF RESIDENTIAL RECYCLABLES<br/>COMPOSITION .....</b>        | <b>25</b> |

## 1. EXECUTIVE SUMMARY

*This report submitted pursuant to NYSDEC Permit Number 7-3142-00028/00002-0, Certificate to Operate the Onondaga County Resource Recovery Facility; NYSDEC Permit Number 7-3156-00047/00001-0 Permit to Construct and Operate the OCRRA Landfill; NYSDEC Permit Number 7-3148-00048/00001-0 Solid Waste Transfer Station-Ley Creek and NYSDEC Permit Number 7-3142-00036/00001-0 Solid Waste Transfer Station-Rock Cut Road. Prepared in accordance with NYCRR Part 360-1.9(f).*

The solid waste management system for Onondaga County (with the exception of the Town and Village of Skaneateles) is managed by OCRRA (Onondaga County Resource Recovery Agency). OCRRA's previous Comprehensive Recycling and Market Analysis Report was submitted in June 2011. The following report updates the previous report and highlights the following:

- Significant upgrades to Amboy Compost Site to expand the **food waste composting program**
- Continued success of a new public education campaign: “**Save the World a Little Each Day,**” which focuses on capturing paper items for recycling
- Continuation of business recognition program, called “**Blue Ribbon Recycler,**” which certifies local businesses that demonstrate recycling excellence
- Expansion of **Extended Producer Responsibility** programs for mercury recycling
- New improvements to OCRRA's popular **household battery collection program**
- Impact of a **non-ferrous metal separation system** at the Waste-to-Energy Facility, allowing for hundreds of tons of metal to be removed for recycling each year
- Creation of new school recycling education video series
- Switch from three Annual Household Hazardous Waste Events to a year-round Monday-Friday collection program

## 2. RECYCLING IN ONONDAGA COUNTY

### 2.1 Current Program

Onondaga County currently has a population of approximately 468,000, with 185,000 occupied households<sup>1</sup>. Since the recycling program's implementation in 1990, more than 13.5 million tons of residential, commercial and institutional materials have been diverted to recycling. The program's efforts have been recognized with numerous state and national awards, including the 2011 NYSDEC Environmental Excellence Award for Food Waste Composting Program, as well as 2011 Waste & Recycling News, Green City Finalist Award, Outstanding Residential Recycling.

OCRRA has a strong recycling program due to its commitment to fund the processing and marketing of recyclables, its ability to maintain long-term contracts for services, including those with material recovery

---

<sup>1</sup> Population data is from the 2013 Census estimate. <http://www.census.gov/>

facilities, and its comprehensive and innovative public education campaign. The result is an extraordinary recycling rate for the community every year. In 2013, the total tonnage recycled through the mandatory source separation law, combined with the voluntary efforts of businesses and residents, resulted in over 575,000 tons recycled, for a recycling rate of 62%; almost twice the national average<sup>2</sup>. OCRRA's service area has maintained an estimated 60% or greater recycling rate for more than a decade.

The following are the materials currently directed for recycling in OCRRA's service area:

| <b>Material</b> | <b>Component Categories</b>               | <b>Disposition</b>   |
|-----------------|---|--|
| Paper           | Newspaper                                 | Diverted to recycling markets  |
|                 | Magazines                                 | Diverted to recycling markets  |
|                 | Corrugated cardboard                      | Diverted to recycling markets  |
|                 | Kraft paper                               | Diverted to recycling markets  |
|                 | Gable-top containers                      | Diverted to recycling markets  |
|                 | Paperboard                                | Diverted to recycling markets  |
|                 | Office paper                              | Diverted to recycling markets  |
|                 | Softcover books<br><b>(added 2011)</b>    | Diverted to recycling markets  |
| Plastic         | PET (#1) bottles                          | Diverted to recycling markets  |
|                 | HDPE (#2) bottles                         | Diverted to recycling markets  |
|                 | PP (#5) containers<br><b>(added 2010)</b> | Diverted to recycling markets  |
| Ferrous Metal   | Food containers (Bi-metal)                | Diverted to recycling markets  |
|                 | Aerosols                                  | Diverted to recycling markets  |
|                 | White/enamelled                           | Diverted to recycling markets  |
|                 | Auto parts                                | Diverted to recycling markets. <i>Not counted in recycling rate.</i> |
|                 | Other ferrous                             | Diverted to recycling markets  |
| Non-Ferrous     | Aluminum cans                             | Diverted to recycling markets  |
|                 | Aluminum foil                             | Diverted to recycling markets  |
|                 | Other aluminum                            | Diverted to recycling markets  |
|                 | Other non-ferrous                         | Diverted to recycling markets  |
| Glass           | Clear containers                          | Diverted to recycling markets  |
|                 | Green containers                          | Diverted to recycling markets  |
|                 | Brown containers                          | Diverted to recycling markets  |

OCRRA's community-wide recycling effort includes residential and commercial recycling mandates and enforcement, as well as tracking voluntary recycling in the commercial, institutional and industrial sectors. The OCRRA program also addresses unique wastes such as household hazardous wastes, yard wastes, household batteries, fluorescent light bulbs and material specific to individual business or industrial generators.

<sup>2</sup> US EPA. Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2009. <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2009-fs.pdf>

The following chart lists items designated as mandatory recyclables and the effective date of implementation:

| <b>OCRRA<br/>Mandated Recyclables</b> |   |   |
|---------------------------------------|---|---|
| <b>Effective date</b>                 | <b>Action affecting<br/>Residential Generators</b>                                  | <b>Action affecting<br/>Commercial/Institutional<br/>Generators</b>           |
| July 1, 1990                          | Glass and metal food / beverage containers<br>Plastic bottles #1 & #2<br>Newspapers | High grade office paper<br>Corrugated cardboard<br>Blue bin items as feasible |
| March 1, 1992                         | Magazines and catalogs  |   |
| April 1, 1992                         | Yard waste banned from MSW  | Yard waste banned from MSW  |
| Fall, 1992                            |   | Encouraged to recycle all office paper  |
| January 1, 1993                       | Aerosol cans (non-paint), gable-top milk and juice cartons and Kraft bags           | All office paper mandated   |
| July 1, 1994                          | Corrugated cardboard  | Corrugated cardboard  |
| July 1, 1995                          | Discarded mail and home office paper  | Discarded mail and home office paper  |
| July 1, 1996                          | Paperboard  | Paperboard  |
| April 1, 1999                         | Pizza boxes   |   |
| January 1, 2001                       | License plates  |   |
| January 1, 2006                       | Aseptic containers  |   |
| July 1, 2010                          | #5 plastics   |   |
| April 1, 2011                         | Softcover books   |   |

OCRRA currently contracts with a private vendor, Recycle America, for the processing and marketing of the residential recyclables. In 2010, a new 4-year contract was negotiated (see *Section 4* for details).

OCRRA also operates two compost sites within Onondaga County. These provide residents with the opportunity to recycle their yard waste and take finished compost with them to use for their gardens from April through November each year. In 2009, OCRRA began a pilot program to compost commercial and institutional food waste at the Amboy Compost Site, located in Camillus, NY. Major renovations were done to the site in 2013 to expand the site to handle 9,000 tons of food waste annually from commercial entities (See *Section 3.3* for more details).

The Syracuse Post Standard reduced the printing of the daily newspaper to 3 days a week effective February 2<sup>nd</sup> 2013. Also in spring 2013, the Scotsman PennySaver ceased production. With these two changes in 2013, there has been a decrease in newsprint available to be recycled, estimated by OCRRA at 2,000 – 3,000 tons annually. OCRRA’s recycling team aims to offset this impact by its continuing effort to increase all recycling, including commercially generated cardboard and office paper, and recyclables generated in schools and apartment complexes.

The OCRRA recycling team includes three Recycling Specialists who visit hundreds of local businesses, apartment complexes and schools annually. They offer assistance in designing recycling programs and

supply businesses, apartments and schools with recycling containers and decals to raise awareness about recycling.

## 2.2 Waste Q & C

In 2005, OCRRA contracted a consulting firm to conduct a county-wide waste composition study, known as the Onondaga County Waste Quantification and Characterization Study (Q&C Study). It sorted and quantified MSW and recyclables in the OCRRA system based on statistical criteria in which vehicle loads were sampled, manually sorted and weighed. The percentage by weight of each component in the sorted sample was then calculated.

A previous Waste Q&C Study was performed in 1998. The following lists notable results from the 2005 study and comparisons to the 1998 study:

- About 15% of disposed MSW is comprised of **paper** that is currently recyclable in OCRRA's service area
- Proportion of **plastics** in disposed MSW increased (from approximately 11% in 1998 to 19% of total MSW in 2005)
  - The largest individual plastic category is #4 LDPE and LLDPE (8.6% of MSW). This consists of items such as film wraps, trays, plastic bags and lids.
  - Plastics categories #3, #6, and #7 were present in the waste stream at approximately 2% of total MSW.
- **Other paper** (non-recyclable paper such as tissues and paper towels) and **food wastes** continue to comprise relatively large proportions of the residential waste stream (approximately 13 and 14% of disposed MSW, respectively).
- There were declines in percent of disposed MSW from 1998 to 2005 in the following categories: Ferrous food containers, aluminum cans, glass and yard waste.
- 2005 was the first year electronics were evaluated. They constituted 1.2% of disposed MSW, which is consistent with the national average<sup>3</sup>.
- Separation of most designated recyclables continues at relatively high levels, as measured by the relatively small quantities present in the waste stream.
- **Newspaper** comprises the largest portion of the recycling stream, at 42%.

Appendix 1 shows data from the Waste Q&C on the percentage of each commodity in the waste stream, as a mean between commercial and residential. Appendix 2 shows data on the percentage of each commodity in the residential recyclable stream.

As of 2014, the data acquired from the most recent study is 9 years old. OCRRA is currently considering its ability to devote resources to planning and executing another large-scale Waste Q&C, but has made no concrete plans as of yet.

The 2012 US EPA report on Municipal Solid Waste Generation provides some more recent national waste and recycling data.<sup>4</sup> The notables from that national report are:

- Food Waste comprises 21.1% of total MSW discarded nationally.

---

<sup>3</sup> US EPA. Statistics on the Management of Used and End-of-Life Electronics.  
<http://www.epa.gov/epawaste/conservematerials/ecycling/manage.htm>

<sup>4</sup> 2012 MSW Characterization Reports  
[http://www.epa.gov/waste/nonhaz/municipal/pubs/2012\\_msw\\_fs.pdf](http://www.epa.gov/waste/nonhaz/municipal/pubs/2012_msw_fs.pdf)

- 8.7% of yard waste is ending up in the trash as well. (note: yard waste is banned from the trash in Onondaga County.)
- Metals which likely could have been recycled but were disposed of account for 9% of MSW.
- The total of the above items is over 38%, which illustrates a large opportunity for improvement on a national basis.

### 3. RECENT CHANGES TO THE RECYCLING PROGRAM

A 1989 Source Separation Law mandates that waste generators in Onondaga County separate designated materials for recycling. The law allows OCRRA to continually evaluate and add items to the list of recyclable materials when deemed appropriate. As markets are proven to exist and are stable and viable, OCRRA's Board of Directors is able to vote to add items to the list of mandated recyclables, both residential and commercial.

OCRRA's comprehensive integrated solid waste management program seeks to address all discards according to the federal and state established waste hierarchy: waste reduction and reuse, recycling, waste-to-energy, and landfill. To that end, OCRRA has established several strategies to maximize recycling in its service area.

In 2005, OCRRA conducted a Comprehensive Waste Quantification & Characterization (Q&C) study (See *Section 2.2*), which provided data on the presence of commodities in the waste stream. The data reported in the Q&C are important aspects of decisions to qualify materials as recyclable or to seek ways to reduce the presence of a specific material in the waste stream. Secondary research then focuses on the following to determine if the commodity can be added to the list of mandatory items:

- Analysis of alternative uses for the material;
- Analysis of markets for material, factoring in collection and hauling costs, processing costs, equipment costs and markets;
- Market surveys to determine price and identify any processing requirements; and
- The toxicity hazard. For example; OCRRA's Mercury Thermometer collection program is driven more by the hazardous nature of mercury than by simple economics.

OCRRA also conducts market surveys by contacting other municipalities, processors and manufacturers to determine prices of materials and to identify technology changes in processing requirements, new opportunities and obstacles to marketing material and regulatory trends.

#### 3.1 New Additions

In the period since the last CRA which was done in June 2011, OCRRA has made no additions to the list of mandatory recyclables. This decision was based on market research and consultations with the contracted Material Recovery Facilities. OCRRA continues to do research and speak with experts regarding the addition of new recyclable items as market conditions dictate.

In 2010 OCRRA added **#5 plastic tubs** to the list of mandatory recyclables and **softcover books** were added in 2011. OCRRA currently recovers **ferrous metal** for recycling at its Waste-to-Energy (WTE) Facility. The non-ferrous system became operational in June 2008 and recovers approximately 500 tons of non-ferrous metals annually for recycling.

#### 3.2 Material Recovery Facility Changes

OCRRA contracts with privately-owned Material Recovery Facilities (MRFs) to accept residential recyclables at no charge, sort and then market the material. In years past, two MRFs were in operation and under contract with OCRRA: Recycle America (part of Waste Management), a single-stream facility, and Naef Recycling, a dual-stream facility. In early 2009, Naef Recycling was closed, leaving Recycle America as the sole MRF operating under OCRRA's contract for the remainder of 2009 and 2010.

In 2010, a new company was formed by an international corporation (CellMark) called Syracuse Recycling and Recovery. It began operations at the former Naef Recycling location after investing significant resources to upgrade and convert the existing dual-stream MRF into a high-tech single-stream facility. Syracuse Recycling and Recovery became fully operational in early 2011.

In 2010, both Recycle America and Syracuse Recycling and Recovery signed the new 4-year contract, which went into effect in January 2011. OCRRA is seeking a one-year extension for 2015. The details of this contract, which allows for market stability for the MRFs, financial stability for OCRRA and a consistent list of recyclables for the public, are outlined in *Section 4*.

In July of 2013, one of the locally operated private MRFs, Syracuse Recycling and Recovery, suffered a fire and is no longer in operation. Currently, it is unknown if Syracuse Recycling and Recovery will reestablish operations in Onondaga County. The other private MRF, Recycle America, has accepted the recyclable materials that were being processed at Syracuse Recycling and Recovery. As a part of the OCRRA MRF contract they are required to accept residential materials from any hauler for a zero tip fee, even during poor market conditions.

The community now has one single-stream facility that processes the majority of residential recyclables. As a result, OCRRA's public education about sorting recyclables has been adjusted, advising residents that all recyclables can be mixed in the blue bins, instead of separating paper from containers (as it was before). This has helped to eliminate some confusion about recycling bin preparation, making curbside recycling a little easier for residents.

### **3.3 Program Expansion: Food Waste Composting**

Since 1992, OCRRA has provided residents with the opportunity to recycle their yard waste at two compost sites. However, there have not been any substantial outlets in Onondaga County for **food waste**; the majority of the material currently goes to the WTE Facility. The 2005 Waste Q&C Study indicated that 14.6% of the waste stream consists of food waste; it is one of the largest components of disposed MSW, by weight.

Large volumes of organics in MSW are not only a local issue, but exist throughout New York State. According to the new state solid waste plan, "Beyond Waste," composting as an environmentally sound solution is a high priority for the NYS DEC. This plan emphasizes the direction of organic materials to their "highest and best use," i.e., composting for soil amendments.

In 2009, OCRRA began accepting institutional and commercial food waste at its Amboy Compost Site. OCRRA employs a technically sound and effective process called an extended aerated static pile system (EASP). In this system, food waste is mixed with ground yard waste, covered with finished compost and injected periodically with air via a blower system. This system allows the material to maintain aerobic conditions with minimal labor and handling. In 2010, some 1,000 tons of commercial food waste were processed at OCRRA's Amboy Compost site on a minimal foot print, with minimal staffing and investment, and without regulatory violation. The EASP system enables OCRRA to process both pre- and post-consumer foods, including meats, and has become a valuable resource for the region's waste diversion and recycling efforts.

In November 2013, after significant facility upgrades, the Onondaga County Resource Recovery Agency (OCRRA) opened the largest municipal food scrap composting facility in New York State. The \$2.4 million Aerated Static Pile (ASP) compost system is designed to process over 9,000 tons of local institutional and commercial food scraps a year, and will ultimately generate over 30,000 yards of premium compost annually. Compared to a windrow approach, OCRRA's ASP system reduces the processing time by 60%, from nine months to less than 90 days for finished product.

OCRRA's new Amboy compost facility is already processing over 50,000 pounds of food scraps on a weekly basis, all of which are turned into a soil amendment that meets the United States Composting Council's Seal of Testing Assurance (STA). The material is sold back to the community for use in gardens and landscapes, as well as for such green projects as "green roofs" and wetland construction.

The project is squarely aimed at meeting OCRRA's vision of "maintaining a world class solid waste management system that makes our community a more sustainable, healthier place to live." Currently, the community disposes over 30,000 tons of food scraps annually. OCRRA's food scrap compost system will help reduce those waste totals, and "close the loop" by recovering organic resources currently in the waste stream to generate a premium soil amendment that returns valuable nutrients to local soils.

In 2014, OCRRA started bagging the 1/4" screened compost for sale in local garden stores throughout Central New York, in addition to selling the material in bulk at the compost site.

The Agency's organics recovery efforts have been previously recognized with Environmental Excellence Awards by both the New York State Department of Environmental Conservation and the US Composting Council. More information is available on the Agency's website at: <https://ocrra.org/about-ocrra/services/food-waste-composting>

In the future, composting systems such as OCRRA's will be at risk from low pricing from landfills that desire organics for methane production, as well as competition for material from biomass energy systems (e.g., anaerobic digesters and biomass power plants). Since landfill gas-to-energy projects are incentivized by the New York State Renewable Portfolio Standard (<http://www.nyserda.ny.gov/rps/>), this issue must be addressed soon, as organics could become an increasingly sought after commodity, depending on the revenue provided – and disparate financial risks – due to various regulatory and tax-based incentives offered to differing organics management systems.

Of additional concern is the trend toward allowing the unregulated application of food waste to farm fields. This practice undermines the investment in engineered systems and also creates the considerable potential for the spread of vectors or disease, including *E. coli*. OCRRA has taken on financial risk by investing major resources into providing a large-scale food waste composting facility for the community. If these issues are not addressed by the DEC, OCRRA's food waste composting programs and other systems throughout New York State risk failure and financial hardships.

### **3.4 Program Enhancements**

#### **Household Batteries**

For over a decade, OCRRA has provided a collection program for Onondaga County residents to properly dispose of their household batteries. These items are diverted from the WTE Facility, as certain types of batteries contain toxic material that should not be combusted. Over 600 tons have been diverted since 2003. OCRRA partners with local Wegmans and other grocery stores throughout the County to provide convenient drop-off locations for batteries. In addition, OCRRA provides special bags for residents to fill

with old batteries and place at the curb during the month of July. Haulers then pick these bags up and deliver them, separate from the trash, to OCRRA for proper disposal.

OCRRA's household battery collection program underwent changes in 2010 as a result of new federal transportation regulations aimed at reducing safety hazards associated with the transportation of batteries. The new regulations state: (1) batteries must be separated by type before they are transported by haulers and (2) rechargeable batteries must be placed in individual bags or have their terminals taped before they are transported. Previously, household batteries were collected at nine area grocery stores year-round and in bags collected alongside trash in July, with all types mixed together.

To comply with the new regulations, OCRRA created new collection containers for the local grocery stores that allow for the separation of alkaline, rechargeable and button batteries. This new system began in 2010. In addition, the annual July curbside collection changed to only allow alkaline batteries in the special bags distributed by OCRRA.

Not only do these program changes comply with new federal transportation regulations, it allows OCRRA to easily remove rechargeable batteries for recycling at no charge (though OCRRA still pays for the weekly collection of the batteries from local Wegmans, and for subsequent sorting services, provided by ARC of Onondaga County). Previously, OCRRA paid to have all mixed batteries properly disposed of. Now, because rechargeable batteries are separated, OCRRA is able to use Call2Recycle<sup>®</sup>, a no-charge rechargeable battery recycling organization funded by the battery industry. This is an example of an Extended Producer Responsibility program that is beneficial to both the environment and solid waste planning units. OCRRA sent over 5,000 pounds of rechargeable batteries for recycling at no disposal cost in 2013. According to Call2Recycle<sup>®</sup>, residents in the OCRRA service area are now recycling more rechargeable batteries per capita than any other large community in New York State. Because of OCRRA's dedication to maintaining an innovative battery program, OCRRA was again invited to serve as a "Foundation Program" by the Battery Recycling Corporation (BRC) in 2013, one of only a handful of communities across the country invited by the BRC to do so. As a result of this public / private partnership, BRC covered the expenses to transport and recycle the thousands of pounds of household alkaline batteries that the Agency collected. The partnership is continuing in 2014, and is aimed at ultimately developing "best practices" for a nationwide collection system managed by alkaline battery manufacturers. In 2013 over 160,000 pounds of alkaline batteries were recycled. More information about OCRRA's battery collection program is available online at: <https://ocrra.org/resource-pages/resource-page-category/household-batteries>

### **Public Education**

In the 2005 waste study, recyclable paper was shown to be a smaller fraction of the waste stream than in previous years, but still a significant portion, roughly 15% by weight.

Food scraps were also shown to be about 15% of the waste stream. In an effort to focus the community on both of these items, OCRRA launched a multi-year public education campaign that focused heavily on these two items.

The 2009 launch focused on paper, since there was already existing infrastructure to handle paper recycling. Items such as newspaper, magazines, corrugated cardboard, paperboard and office paper were prominently featured in our "Save the World a Little Each Day" campaign. It stressed the reasons why one should recycle paper. It also underscored how the simple act of recycling can have a big impact on the environment and make the world a better place for our children. The campaign, consisting of television, radio, online, billboard and print media advertising; new promotional material; and a new logo, was extremely effective. Variations of the campaign ran from 2009 through 2011. Since 2008, paper recycling has increased 16%, resulting in an additional waste reduction of almost 44 million pounds.

In 2012, as OCRRA ramped up its food scrap composting operation at our Amboy Compost Facility, the second phase of the public education campaign began. It continued to convey the importance of Recycling and incorporated two other facets of OCRRA's operations, Waste-to-Energy and Composting. This campaign encompassed television, radio, and online advertising (including a new component: paid social media, which expanded our reach). As a result, our compost pass sales increased an unprecedented 18% in 2013.

OCRRA's messaging is communicated to the public in a variety of ways, above and beyond the advertising campaigns mentioned above. OCRRA prints and distributes a popular quarterly newsletter, which reaches over 110,000 households. Bimonthly, OCRRA sends an email blast to a list of over 7,000 people, which highlights upcoming events, program changes and recycling reminders. In addition, OCRRA's website ([www.OCRRA.org](http://www.OCRRA.org)) is a popular place for residents to access recycling information 24 hours a day. This site receives between 8,000 and 10,000 monthly visits. OCRRA also orchestrates an extensive public relations effort that includes frequent press releases that generate media coverage on the news as well as local television and radio shows, in addition to print coverage in the area's daily and weekly papers. Lastly, OCRRA staff regularly attends community events where thousands of informational magnets, brochures and other recycling, composting and waste reduction prompts are distributed.

#### **Outreach Awards**

- Arc of Onondaga - Robert D. McAuliffe Community Service Award for Battery Recycling Program (2013)
- Rechargeable Battery Recycling Corporation - Leader in Sustainability Award (2013)
- Constant Contact Marketing All-Star Award (2012)
- GreeningUSA Advocacy Award (2012)
- American Forestry and Paper Association Award for Community Recycling (2011)
- NYS DEC Environmental Excellence Award – Composting (2011)
- Solid Waste Association of North America (SWANA) Excellence Award, Silver – Marketing (2011)
- SWANA Excellence Award, Silver – Composting (2011)
- SWANA Excellence Award, Bronze – Integrated Solid Waste System (2011)
- Waste & Recycling News, Green City Finalist Award, Outstanding Residential Recycling (2011)

For businesses, OCRRA developed the Blue Ribbon Recycler program ([www.BlueRibbonRecycler.com](http://www.BlueRibbonRecycler.com)), a business certification program that rewards companies meeting specific recycling-related criteria. This has served as an incentive for business recycling, allowing them to use the recognition as a marketing tool. At the end of 2013, 65 businesses had been honored with this certification. One of those businesses is selected each year as the, "Recycler of the Year". In addition, OCRRA has continued extensive public education in Onondaga County schools. The School Recycling Pledge program remains the most widespread program, providing a custom-printed and framed poster to every school in Onondaga County. The pledge highlights school-wide commitments to recycling and has been effective in increasing recycling and raising awareness in the schools. More than 120 schools have signed on to the pledge. With the new public education campaign and innovative school and business programs, OCRRA is striving to capture more and more recyclable paper. In 2013, after receiving feedback from local teachers, OCRRA started working on an innovative new school video project. The project will be easier for teachers to fit into their busy schedules and will include lesson plans, white board activities and videos that all meet Common Core curriculum criteria.

## **Electronics**

From 2007 to early 2010, OCRRA operated a year-round drop-off center for electronics, fluorescent bulbs, books, batteries, cell phones and smoke detectors for proper disposal. This provided a convenient means of proper disposal for many items for Onondaga County residents. However, the cost burden for the operation of the facility and the collection and recycling of these materials, particularly electronics, became too high to be solely OCRRA's responsibility. The center was closed in March 2010. While open, OCRRA accepted over 1.7 million pounds of electronics and over 700,000 pounds of books. OCRRA currently directs residents to other convenient, local avenues for recycling of these items.

Since OCRRA's e-waste recycling program's inception in 2002, over 4 million pounds of e-waste has been collected for recycling in Onondaga County. Due to New York State's newly passed EPR law, which took effect in April 2011, OCRRA steers residents toward other local electronics recycling outlets. These locations are convenient and, according to the new law, will not charge a fee for electronic waste. This new legislation is a welcome change, transferring the financial burden to recycle e-waste from local governments to manufacturers – which in turn will encourage manufacturers to design products that are easier to recycle.

## **Extended Producer Responsibility**

OCRRA has been involved in many Extended Producer Responsibility (EPR) initiatives in the last few years. EPR requires manufacturers to take responsibility for the safe and environmentally sound disposal of items they make and sell. This includes reducing toxic materials used for manufacturing and a requirement to implement some form of a take-back and reuse and/or recycling program.

New for 2013, New York passed a bill to require manufacturers to collect mercury thermostats. The bill, known as the Mercury Thermostat Collection Act, requires that manufacturers develop and implement a thermostat collection program that meets a pre-established goal of collecting 15,500 thermostats by 2015. The bill also calls for the New York Department of Environmental Conservation (NYDEC) to establish annual collection goals thereafter, and to make changes to the program if manufacturers fail to meet these goals. This could include requiring manufacturers to pay financial incentives to recyclers to encourage greater participation.

In 2010, New York State passed the Electronic Equipment Recycling and Reuse Act, which ensures that manufacturers are responsible for the recycling costs of electronics, whether physically or financially. This law, which went into effect in April 2011, is a welcome release from the cost burden of handling and recycling the electronic waste stream for many municipalities. According to the law, residents must have access to convenient drop-off locations at no charge. That, along with a phased-in electronics ban from municipal solid waste, incentivizes recycling of e-waste and requires the manufacturers to assume material management costs at end of the items useful life.

In addition to e-waste, in 2010 New York State adopted legislation to require manufacturers of rechargeable batteries to provide recycling for their products, physically or financially. This entails manufacturers providing outlets for recycling at all retail locations that sell rechargeable batteries at no charge to the consumer. This is another welcome relief for municipalities. While OCRRA has used the no-charge Call2Recycle<sup>®</sup> program to recycle residents' rechargeable batteries, this legislation gives consumers even more convenient outlets, ultimately lessening OCRRA's labor burden to handle this material.

There are many other items that are currently managed by planning units that could be financed by the manufacturers. These include, old thermostats, thermometers and fluorescent light bulbs; CFC-containing appliances, such as air conditioners; old appliances; paint; mattresses; and finally, packaging. These items are currently handled either in the MSW stream or as a household hazardous waste; all of which incur a

cost to planning units. These costs become particularly difficult to absorb with the state's delays in releasing HHW grant funds to the planning units. While crafting EPR legislation for some items is more complicated than others (namely, packaging), the impacts these materials have on municipal waste systems make it beneficial for the state to continue to investigate and push for these types of laws.

## **4. COST OF RECYCLING PROGRAMS**

### **4.1 Blue Bins**

Perhaps the most visible item to the community distributed by OCRRA is the **blue bin**, which is a 14-gallon curbside recycling container. These bins are given to residents in OCRRA's service area at no charge. The 33 municipalities that are part of OCRRA's program house a supply of blue bins at their individual highway department facilities or town clerk's offices. This allows residents to have easy access to blue bins when needed. In addition, OCRRA keeps blue bins at many of its own facilities for users and hosts "blue bin giveaways" throughout the County.

In 2012 & 2013, OCRRA invested over \$400,000 to purchase 80,000 new blue bins for the community. Each year, thousands are given to residents that need a replacement bin, need additional bins to handle more recycling or are receiving a bin for the first time. OCRRA's curbside recycling program has been tremendously successful, capturing approximately 40,000 tons of material each year. A portion of this success can be attributed to residents' easy access to free recycling containers.

### **4.2 Blue Bin Items**

Recyclables collected at the curb are taken for processing and marketing to material recovery facilities, (MRFs). Pursuant to OCRRA's contract with local MRFs, they receive residential recyclables collected by private haulers, municipal haulers and municipalities with private hauling contracts. The OCRRA MRF contract requires the MRFs to accept residential recyclables at no charge to the waste hauler, even during material market low periods, and then sort, bale and market the recyclables. The OCRRA/MRF contract provides for a variable payment to the private MRF companies.

In 2010, OCRRA's five-year contract agreement with private local MRFs was set to expire. A new four-year contract was negotiated over 2010, to begin in 2011. Two private local MRFs signed the new long-term contract: Recycle America and Syracuse Recycling and Recovery, which is no longer in business due to a fire in July 2013. This contract reduces OCRRA's annual risk in connection with payments to the MRFs for material processing, potentially generates income for OCRRA under favorable market conditions and provides certainty and stability for the community's recycling system during commodity market lows. As a result of the contract, the MRFs accept residential recyclables at no charge to the waste haulers. The existing 4-year contract is set to expire at the end of 2014, but there are two optional 1-year extensions that can be implemented upon mutual consent by both parties.

Taking into consideration the value of the commodities in the blue bin, OCRRA pays the MRF for processing and marketing residential recyclables using a formula adopted in the contract. Each year, the contracted MRFs pay OCRRA for residential recyclables processed, with agreed upon upper limits, which are used to cover a small portion of the costs for recycling outreach and education. Payments may be made from the MRFs to OCRRA, or from OCRRA to the MRFs, depending on the market prices of old corrugated cardboard (OCC) and old newspaper (ONP): consistent average prices below \$60/ton may require a payment from OCRRA; market prices above \$100/ton may require a payment to OCRRA from the MRFs.

The MRF contract is a valuable tool which allows OCRRA to formulate and maintain a uniform definition of “blue bin” recyclables. The contract also encourages stability in the local recycling program by attenuating the sometimes volatile variation in global market demand and pricing. This uniformity helps facilitate the successful education and enthusiastic cooperation of the public.

Benefits of the long-term contract term between OCRRA and the MRFs include the following considerations:

- The MRF contract is a partnership between OCRRA and the private sector; a 4-year contract enhances the MRFs’ ability to invest in capital improvements, which in turn improves the community’s recycling infrastructure.
- A 4-year term is helpful to MRFs’ ability to negotiate contracts with the mills which buy local recyclables, thus stabilizing the local recycling system and the marketing of materials to mills.
- Both MRFs indicate that a 4-year contract helps them stabilize their business, obtain loans for critical equipment, enter into more favorable and less volatile material sales contracts and shows a commitment to their operations. The contract also provides flexibility in that, if OCRRA were to consider opening its own MRF, there is a 3- or 4-year lead time prior to start up.

Fluctuations in the commodity markets are difficult to predict from year to year. As seen in the table below, the abrupt market downturn of many commodities in late 2008 and into 2009 resulted in a payment to the MRFs for 2009. However, market conditions sustained high enough prices in 2010 & 2011 that OCRRA again saw a net return from the MRFs. There was a brief price drop in 2012 that stabilized in 2013, and as of May 2014, continues to be stable with zero payment going in either direction.

| Year | Payments   |
|------|------------|
| 2004 | \$19,804   |
| 2005 | \$74,727   |
| 2006 | \$68,668   |
| 2007 | (\$66,820) |
| 2008 | (\$58,250) |
| 2009 | \$158,106  |
| 2010 | (\$37,256) |
| 2011 | (\$78,251) |
| 2012 | \$36,006   |
| 2013 | \$0        |

### 4.3 Costs of Other Selected Programs

#### Household Hazardous Waste

OCRRA has held at least two household hazardous waste (HHW) collection events each year from 1991 to 2010; in 2009 and 2010, three HHW collections were held each year. Every two years, contractors bid on providing the material handling and disposal services for these events. OCRRA’s direct costs include the fee charged by the vendor to conduct the event (including waste transport and disposal). Indirect costs include OCRRA personnel to work the event, as well as personnel hours spent beforehand managing the email reservation system and sending out confirmation packets to residents with appointments for the event. As of 2008, OCRRA no longer accepts latex paint, as it is not classified as a hazardous waste.

OCRRA provides instructions for residents to properly dispose of old latex paint with their regular trash. Each year, OCRRA applies for a NYS DEC grant to cover 50% of the costs of the HHW program.

A major change was made in 2013 to the Household Hazardous Waste (HHW) collection model. In response to residents' suggestions, OCRRA has made its popular Hazardous Waste Collection Program even more convenient. Instead of three Saturday events, OCRRA switched to a Monday-Friday drop-off at Environmental Products and Services of VT, Inc. This popular environmental service allows residents to safely dispose of their hazardous waste, keeping these materials out of the waste stream. Among the hazardous wastes collected are adhesives and resins; oil-based paint; paint thinner; solvents; thermometers, thermostats, and other mercury containing products, pesticides and fluorescent light bulbs. Direct costs include the fee charged by the vendor based on the amount of Hazardous Waste brought in by the resident. The NYS DEC has committed to reimburse OCRRA 50% of program costs to support the HHW program. HHW program costs were \$154,216 for 2011, \$135,320 for 2012 and \$55,804 for 2013.

### **Household Batteries**

Onondaga County Wegmans grocery stores and Green Hills Market, in Syracuse, are year-round collection points for household batteries. OCRRA workers collect batteries from these sites each week. Residents can also drop off batteries at the Rock Cut Road Transfer Station as well as participate in a curbside collection of batteries during July. Residents do not pay any fees for battery recycling. Batteries are currently separated, due to new federal regulations, into alkaline, rechargeable and button.

Alkaline batteries are currently recycled through a "Foundation Program" paid for by the Corporation For Battery Recycling (CBR), previously OCRRA paid to have them disposed of. Rechargeable batteries are sent at no cost to Call2Recycle® for recycling, and button batteries are shipped for hazardous material removal and recycling. OCRRA's cost for recycling in 2013 beyond the financial support provided by CBR was approximately \$30,000, including, battery sorting and weekly battery collection costs from local Wegmans. OCRRA collected more than 89 tons of batteries in 2013; over 8 tons of which were rechargeable (includes lead acid batteries and rechargeable batteries sent to Call2Recycle®).

### **Other Programs**

A discussion and overview of other small-scale recycling and reuse programs that OCRRA maintains can be found in the Annual Recycling Reports, submitted to the NYS DEC and published online: [http://www.ocrra.org/about\\_annual\\_reports.asp](http://www.ocrra.org/about_annual_reports.asp). These include programs such as the fluorescent light bulb program, in which OCRRA partners with 15 local hardware stores to collect and recycle residents' fluorescent bulbs at no charge; and a mercury thermometer exchange program, where residents can bring old mercury thermometers to OCRRA's Rock Cut Road Transfer Station to be properly disposed of in exchange for a new digital thermometer. Old mercury thermostats are accepted as well. These two programs help keep mercury, a harmful chemical, out of the combustion process at the WTE Facility. In 2013, over 8,200 bulbs were collected and over 160 thermometers were handled in by residents.

## 5. RECYCLING MARKET TRENDS

### 5.1 Recyclable Markets, 2011-2013

Markets for OCC (corrugated cardboard) and ONP (newspaper) were strong in 2011, and fell slightly in 2012. Since the end of 2012, markets have been very stable through 2013 and that has continued into mid-2014. This is illustrated in Figure 1.

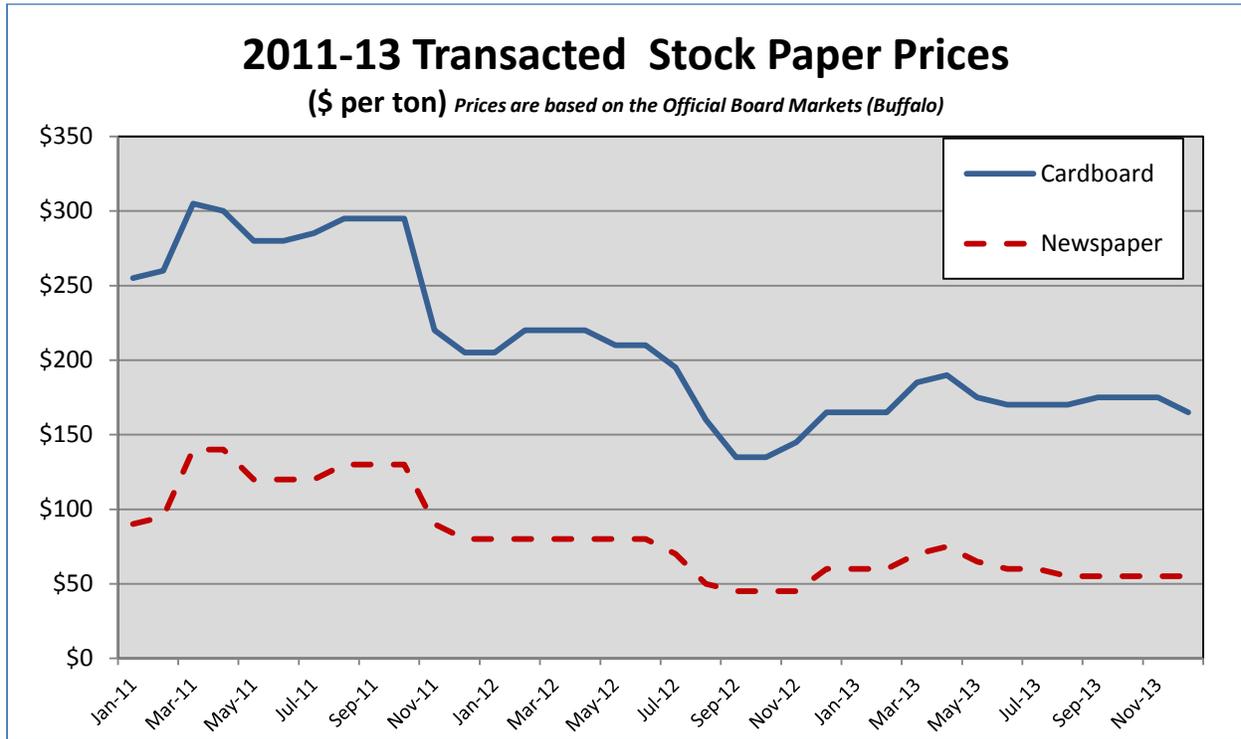


Figure 1<sup>5</sup>

2013 year-end values for OCC and ONP are similar to those from 2012, as seen in the Figure 2 below. Fluctuations in the commodity markets are difficult to predict from year to year. In 2013, prices for OCC and ONP fluctuated only slightly in March and April. According to RISI Recovered Paper analyst Hannah Zhao, in the next two years, pricing at US mills for OCC is expected to rise almost 50%. Zhao expects the 2013 national average of \$110 for US mills to rise to a \$135 average in 2014 and a \$146 average in 2015. The prices in 2014 have not been as high as Zhao predicted. The OCC and ONP markets will be closely tracked by OCRRA.

<sup>5</sup> Paper Prices are from the Official Board Markets (Buffalo) in PPI Pulp & Paper Week

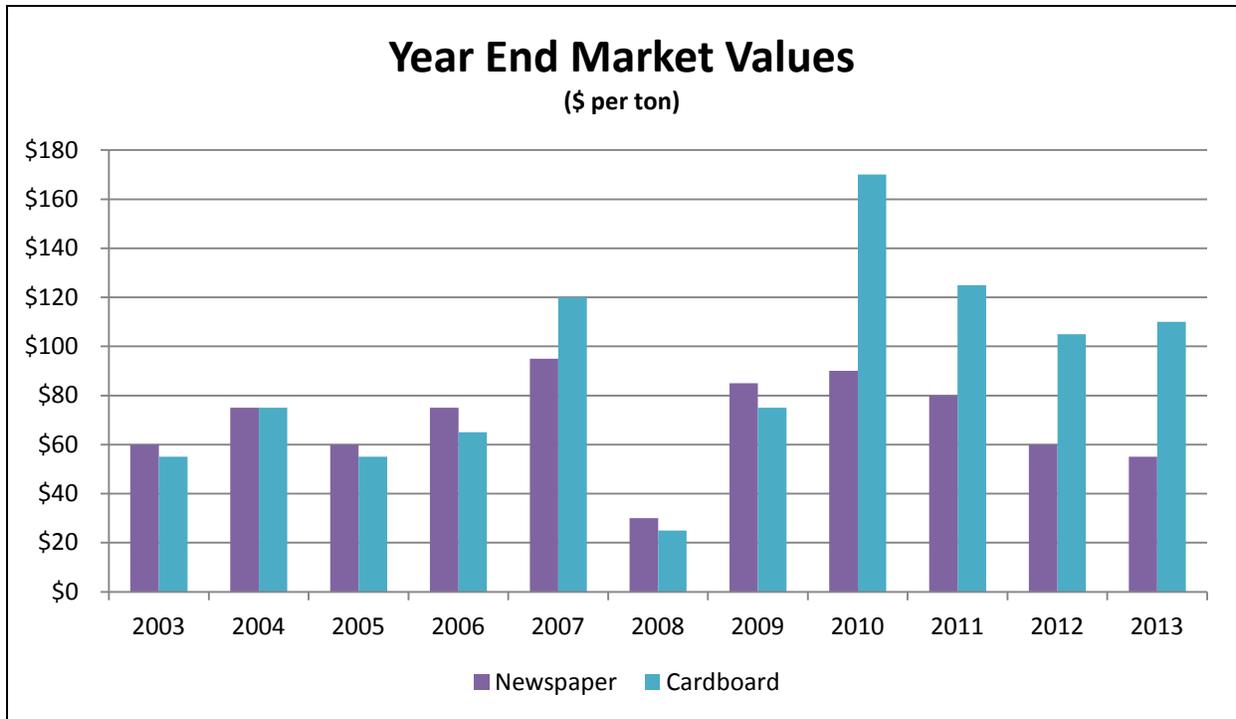


Figure 2<sup>6</sup>

Global commodity market developments continue to impact domestic recycling conditions. The most significant global market event that affected recycling nationwide in recent years was “Operation Green Fence,” which was China’s way of cracking down on imported materials for recycling. China initiated strict quality control measures upon scrap importers, because they were being sent bales of recyclables that were heavy with dirty recyclables and garbage. Those items have to be sorted out and then become China’s garbage.

China’s ban on “low quality” bales of recyclables impacted some recycling facilities in other parts of the country that were forced to improve their material sorting efforts and therefore lower their percentage of contamination. Some recycling facilities stopped accepting some items due to a lack of market demand; the Southern Oregon Aspire Recycling Center no longer takes a range of materials, including clear plastic clamshell containers used for packaging, blue propylene hospital gowns and colored plastic bags.<sup>7</sup>

It’s important to mention that OCRRA does not accept clamshells, hospital gowns or plastic bags in our recycling program. OCRRA is very particular in what it decides should become a mandatory recyclable. If there is not a sustainable, viable, long-term market for those items, then they will not become a new blue bin item. This prevents the Agency from having to “remove” items from the blue bin program. The problems that other areas such as Oregon are having are not likely to occur here because of OCRRA’s careful recycling decisions.

China’s “Operation Green Fence,” and the opening of a new fiber mill in New York, is partly responsible for cardboard exports to China being down in 2013. China’s share of US OCC fell to 25% last year, with exports down 928,000 tons according to PPI Pulp & Paper Week.<sup>8</sup> This is not all bad news according to Plastics News; the Green Fence is opening up opportunities for some U.S. plastics recyclers, saying this

<sup>6</sup> Market Values are from the Official Board Markets (Buffalo) in PPI Pulp & Paper Week

<sup>7</sup> <http://www.dailytidings.com/apps/pbcs.dll/article?AID=/20130819/NEWS02/308190303/-1/NEWSMAP>

<sup>8</sup> <http://www.risiinfo.com/content-gateway/marketprices/news/Recovered-Paper-Chinas-share-of-US-OCC-falls-to-25-last-year-with-exports-down-928000-tons.html>

levels the playing field and legitimate recyclers applaud this and won't be affected because they were always playing by the rules.<sup>9</sup> Cardboard in Onondaga County is shipped to RockTenn in Solvay, NY, for recycling/processing into liner board for new boxes.

## 5.2 Current Market Outlooks

The following are market outlooks for other materials (from Resource Recycling, May 2014):

- **Ferrous:** “The U.S. ferrous scrap market continues to be dominated by North American consumers because a sizable drop in export demand has raised the purchasing power of local mills. With slow but steady improvement in domestic steel demand, these mills pushed April and May scrap prices up by \$20 to \$40 per metric ton in many markets. Of special note were rising steel orders from automakers.”
- **Non-Ferrous:** “With Chinese economic growth being pushed down by governmental policy, Chinese scrap demand has fallen about 15%. This recent market development continues a long string of weak copper fundamentals, represented by the one-third price drop in the last three years. With the global copper market currently seeing inventories of 400,000 tons above demand, analysts see no long-term price improvement in the coming year.”

| Projected trends for mid-2014 |                     |                   |
|-------------------------------|---------------------|-------------------|
| Material                      | Demand              | Price             |
| Ferrous                       | Domestically driven | Flat              |
| Aluminum                      | Metal will move     | Slight uptick     |
| Paper                         | Waiting on China    | Small changes     |
| Plastic                       | Steady              | Little volatility |

- **Plastics:** Mixed HDPE (High-density polyethylene) and PET (Polyethylene terephthalate) markets have been steady. HDPE natural is doing well enough that some MRFs are sorting it out for a higher market.
- **Glass:** In NYS right now there is a shortage of good recycling markets for glass. This is a trend nationally as well. To clarify, “Bottle Bill” glass has a market, MRF glass does not. The glass from our local MRF goes to a landfill to either be used as cover or temporary roads. “There is no solution in sight to the poor marketing conditions for glass.”<sup>10</sup>

## 6. MATERIAL TRENDS AND IMPACTS

On the national level, there continues to be lack of federal support for recycling. Federal tax benefits favor the use of virgin material in manufacturing while there are no tax benefits to encourage the use of secondary material. While recent markets have been strong, the lack of Federal support may limit the growth in demand for secondary material and keep the market prices down. There is a continued need for local financial support to sustain the collection, sorting and processing of recyclables. OCRRA’s MRF agreements are recognized as supportive of stable and consistent demand for recyclable commodities. The MRF contract also provides a guarantee that local waste haulers will never pay a tipping fee for the residential recyclables they collect and also that those materials will be recycled.

<sup>9</sup> <http://www.plasticsnews.com/article/20130712/NEWS/130719975/us-based-recyclers-may-gain-from-chinas-green-fence>

<sup>10</sup> <http://waste360.com/waste-management/waste-management-recycling-and-power-networks>

In the OCRRA service area, recycling continues to be strong although several national and local trends tend to diminish the tonnage of material available for recycling. One factor, “thin-walling” or “lightweighting,” reduces the weight of recyclable items by decreasing the material used in products. This is apparent in many products, including PET bottles, aluminum cans and corrugated cardboard items. The trend toward lightweighting now includes the replacement of heavier rigid containers with lighter weight flexible packaging. Examples include: readily recyclable paperboard cereal boxes and HDPE milk jugs being replaced with flexible bags, which are not easily recyclable and not accepted in most residential recycling programs. These trends save manufacturers on materials needed, transportation costs and potentially decrease the overall carbon footprint of a product, but can replace a recyclable material with a non-recyclable material that ultimately ends up in the trash.

Another trend involves newspapers, which make up the largest portion in OCRRA’s residential recycling stream, at 42% of all curbside recyclables. The current trends are moving towards smaller and thinner newspapers. In general, papers like the New York Times and the Wall Street Journal are seeing lower circulation rates, partly due to increased internet use.

The Syracuse Post Standard reduced the printing of the daily newspaper to 3 days a week effective February 2<sup>nd</sup> 2013. Also in spring 2013, the Scotsman PennySaver ceased production. With these 2 changes in 2013 there has been a decrease in newsprint available to be recycled, estimated by OCRRA at 2,000 – 3,000 tons annually. OCRRA’s recycling team aims to offset this impact by its continuing effort to increase all recycling, including commercially generated cardboard and office paper, and recyclables generated in schools and apartment complexes.

The population of Onondaga County has been stable at roughly 450,000 since 1990. Despite the changes in packaging and production technology, which tend to decrease the per capita tonnage of recyclable materials available to a stable total population base, the community’s ability and commitment to maintain both the tonnage and the percentage waste recycled is impressive. OCRRA continuously seeks to strengthen this commitment through education, financial and regulatory support of the local recyclable commodity market and the identification of new waste streams which can be tapped for diversion.

## **7. EVALUATION OF MATERIALS**

The decision concerning what materials to recycle involves a number of factors. They include the ease with which people can sort and prepare the items for recycling; the cost and feasibility to collect the materials at the curb and sort at the MRFs; and, most importantly, the long-term stability of the market for the sale of the material. The materials collected in OCRRA’s recycling program are not simply diverted into the curbside blue bin collection; they must also be materials that are recovered by recycling and converted into new products or materials.

The waste stream is diverse, as demonstrated in Appendix 1. While recycling and disposal are the main focus of most planning units, providing environmentally sound solutions means also devoting ample consideration and resources to source reduction and reuse options. For some materials, for example polystyrene, a recycling solution is not readily available and would require substantial resources and infrastructure that do not currently exist for residential programs throughout the US. Instead of budget-constrained solid waste agencies looking for recycling outlets for items that are not readily recyclable, it is more effective to encourage, promote and provide resources for source reduction and reuse options. Source reduction and reuse help save local planning units from devoting valuable resources to an expensive venture and empower businesses and residents to become more actively involved in the

reduction of the community's MSW. And, according to the EPA<sup>11</sup> and the NYS DEC<sup>12</sup> waste hierarchies, source reduction and reuse are the most preferable options for handling solid waste. The success of these methods is difficult to measure, but any further waste characterization studies will shed light on the topic.

Below is a discussion of various materials that are not currently included in OCRRA's recycling program or are included on a limited basis.

**PET #1 containers: .1% of the waste stream**

.1% according to the 2005 Waste Q&C, this seems like a small amount, but since 2005 this item has greatly increased in popularity. Thermoform PET, also known as a plastic clamshell, is not currently accepted in the OCRRA recycling system. Thermoforms, due to the shape and adhesive labels are not always able to be sorted and recycled easily. NAPCOR (National Association for PET Container Resources) is dedicated to resolving those issues and increasing recycling. Experts predict that in the next 5 years MRFs will collect and separate the PET thermoforms and that all reclaimers will accept them.<sup>13</sup> OCRRA will continue to monitor developments and work with our MRF regarding the market demand of PET.

**#3, #6 and #7 Plastics: 2% of the waste stream**

Plastic resins #3, #6 and #7 are not currently collected for recycling in OCRRA's service area. The demand for these plastics is not currently stable in the long term and there are few processing facilities for these materials. The demand for scrap plastics is dependent on these limited facilities purchasing and using the material to manufacture new products.

There is only a small quantity of #3, #6 and #7 plastics in Onondaga County's waste stream (~2%), according to the 2005 Waste Q&C. Collecting this relatively small amount of material would increase the cost of recycling by:

- Increasing the sorting costs to the MRFs. These plastics include many different shapes and sizes of materials; particularly #7, which is a category that includes all composite resins of varying mixtures. This would mean sorting items into potentially dozens of categories.
- Increasing storage costs. Since only truckloads of each item are shipped to a market, it could take months (or more) to collect a truckload of material for some of these plastics.

At present, the demand in the markets for #3, #6 and #7 plastics is not consistent. And, according to the MRFs in OCRRA's service area, the revenue generated by the added plastics would most likely not offset the costs of the additional labor needed. These issues, along with increased storage and collection costs, do not make this a viable market for OCRRA to enter at this time. However, changing technology may alter the situation in the future. For example, the market and MRF conditions became viable enough to add #5 plastics to the list of recyclables in 2010. OCRRA continually tracks market economics and technological possibilities for recycling all types of plastics.

While recycling is not a feasible option for these plastics, OCRRA encourages residents, businesses and institutions to examine ways in which they can use less of this material by eliminating it altogether, reusing it or finding a recyclable alternative.

---

<sup>11</sup> <http://www.epa.gov/epawaste/nonhaz/municipal/hierarchy.htm>

<sup>12</sup> Beyond Waste. A Sustainable Materials Management Strategy for New York State. NYS DEC. [http://www.dec.ny.gov/docs/materials\\_minerals\\_pdf/frptbeyondwaste.pdf](http://www.dec.ny.gov/docs/materials_minerals_pdf/frptbeyondwaste.pdf)

<sup>13</sup> Resource Recycling, December 2013, p29.

#### **#4 Plastics: 8.6% of the waste stream**

LDPE and LLDPE plastics (#4) are present in substantial amounts in Onondaga County's waste stream, particularly as film wrap and plastic bags. As with other materials, OCRRA encourages the reduction and reuse of the plastic bags by making the community aware of alternatives (reusable bags for sale at many grocery stores) and ways they can reuse existing plastic bags. The intent is to minimize the amount of bags that need disposal, as they often end up in the waste stream or as litter.

Plastic bags and films are recyclable; however these plastics pose problems that hinder them from being included in OCRRA's residential recycling program. First, #4 plastics create unique challenges for MRFs. They come in a variety of shapes and sizes: shrink wrap, bags or bulkier items such as trays. Separation of these assorted materials could significantly increase the amount of man-hours spent at a MRF and lead to greatly increased labor costs. In addition, plastic bags mixed with other recyclables cause problems with sorting machinery, which cost time and money to remedy. Second, markets for the majority of #4 materials are for plastic film wrap, which is required to be uniform and uncontaminated. This is difficult to achieve in any sort of residential collection, as these films are coming from multiple sources and have many opportunities to become contaminated with food or chemicals.

For these reasons, it is more effective for large companies to set up their own recovery systems for uniform plastic films. For example, Wal-Mart has implemented a system of baling its plastic shrink wrap within its cardboard and backhauling the bales to processors. This allows for efficiency, as the uniform and clean shrink wrap goes from the packages straight to the processors.

In January of 2009, the NYS DEC's Plastic Bag Reduction, Reuse and Recycling Act became effective. This requires all retail stores within New York State that are 10,000 square feet or more in size and that provide plastics bags to customers to establish and maintain a plastic bag recycling program. This law was established to ensure convenient recycling locations for consumers to drop off their used plastic bags. By requiring stores to report data on weight and end market, the NYS DEC has the ability to ensure that the bags collected are actually being recycled. OCRRA frequently promotes this plastic bag take-back program to the public. It is beneficial to the OCRRA system, as it aims to keep plastic bags out of the trash AND the blue bins, where they ultimately create problems with MRF sorting machinery.

#### **Textiles: 5.8% of the waste stream**

Textiles, comprising 5.8% of Onondaga County's waste stream, do have viable markets for reuse and recycling. There are ample opportunities for textile reuse in Onondaga County; OCRRA strongly encourages residents to donate these items. Two major charities, the Rescue Mission and the Salvation Army, along with other smaller charitable donation centers, collect old clothes and textiles at drop-off locations throughout Onondaga County. These locations not only collect re-sellable clothing items, but old textiles that will be sent for recycling into rags. OCRRA informs the public of these donation centers via its public education campaign and helps support the mission of these charities by providing a credit towards their trash fees based on the amount of donations they collect.

Reuse does divert a significant amount of textiles from the waste stream; in 2010, more than 3,600 tons were collected by donation centers in the OCRRA service area. Curbside recycling of textiles is not practical for various reasons, such as the need to keep material clean and dry; a nearly impossible feat in Upstate New York weather. Curbside is also not a viable option because textiles cannot be sorted out safely at the MRF; they would wind up around the sorting equipment and could cause a fire. OCRRA continues to pursue reuse as the most viable option for residents' used textiles.

The U.S. EPA estimates that textile waste occupies nearly 5% of all landfill space. While the EPA estimates that the textile recycling industry recycles approximately 3.8 billion pounds of post-consumer textile waste (PCTW) each year, this only accounts for approximately 15% of all PCTW, leaving 85% in

our landfills. The average US citizen throws away 70 pounds of clothing and other textiles annually.<sup>14</sup> Because of this OCRRA is part of a new statewide push with NYSAR3 (New York State Association for Reduction, Reuse and Recycling) to promote textile recycling and help increase it with public education.

### **Books: 0.6% of the waste stream**

After market examination and discussions with the local MRFs, in April 2011 OCRRA's Board of Director's voted to add softcover books to the list of acceptable items for the curbside recycling program. Residents are still encouraged to donate books (soft and hardcover) in good condition to local charities and libraries before considering recycling to promote reuse. Hardcover books were not included in the addition, as they present special problems for recycling because covers and glue backing need to be removed before the paper can be recycled. Therefore, hardcover books are encouraged to be donated to local charities for reuse, or if in poor condition, trashed.

### **Food Waste: 14.6% of the waste stream**

The 2005 Waste Q&C Study indicated that 14.6% of the waste stream consists of food waste. This is the second largest component of disposed MSW, after "Other Paper" (See *Section 2.2*).

Because food waste constitutes such a large portion of the MSW in Onondaga County and is a material that can be readily composted, OCRRA instituted a commercial food waste composting pilot program in 2009. OCRRA employs a technically sound and effective process, called an extended aerated static pile system (EASP), where the food waste is mixed with ground yard waste, covered with finished compost and injected periodically with air via a blower system. This system allows the material to maintain aerobic conditions with minimal labor and handling. The project has met great success and continues to grow. In 2010, some 1,000 tons of commercial food waste were processed at OCRRA's Amboy Compost Site on a minimal foot print, with minimal staffing and investment and without regulatory violation. Included in this total are regular deliveries of food waste from Syracuse University's Food Services Department and many local restaurants. The EASP system enables OCRRA to process both pre- and post-consumer foods, including meats, and has become a valuable resource for the region's waste diversion and recycling efforts.

For details about OCRRA's expanded food waste composting site, see *Section 3.3*. In addition to promoting commercial food waste composting, OCRRA encourages residential backyard composting and provides informational resources, via the OCRRA website, email blasts and printed brochures.

### **Electronics: 1.2% of the waste stream**

While electronics constituted a relatively small percentage of the waste stream (1.2%) in the 2005 Waste Q&C, the EPA states that the generation of this material is consistently increasing nationwide<sup>15</sup>. If predicted trends occur, this percentage could significantly increase in the coming years.

Reuse and donation of electronics is encouraged; OCRRA asks residents to check with donation centers for their ability to resell certain items first. However, electronics' function quickly becomes obsolete as new products emerge and many donation centers have strict criteria when accepting items like TVs and computers. Therefore, reuse is not always a viable option, particularly for older items.

Since OCRRA's e-waste recycling program's inception in 2002, nearly four million pounds of e-waste has been collected for recycling in Onondaga County. Due to New York State's Extended Producer Responsibility law, which took effect in April 2011 and puts the financial burden for end of life costs onto

---

<sup>14</sup> <http://www.wearonaterecycle.org/about/issue.html>

<sup>15</sup> US EPA. Statistics on the Management of Used and End-of-Life Electronics.  
<http://www.epa.gov/epawaste/conservation/materials/recycling/manage.htm>

the manufacturers, OCRRA steers residents toward local electronics recycling outlets and has the information listed on the OCRRA website, [www.OCRRA.org](http://www.OCRRA.org). These locations are convenient and, according to the new law, will not charge a fee for electronic waste. This new legislation is be a welcome change, transferring the financial burden to recycle e-waste from local governments to manufacturers – which in turn will encourage manufacturers to design products that are easier to recycle.

As of June 2014 there have been some challenges in regards to the E-waste law but the law has significantly increased the amount of e-waste being recycling across the state. Some modifications will need to be made to ensure the laws success.

## 8. CONCLUSION

OCRRA's recycling program continues to evolve each year as the waste stream changes, as markets fluctuate and as new technology emerges. In order to stay ahead of the game, OCRRA continually evaluates materials to determine the most environmentally sound and economically feasible method of keeping items out of the trash. In many cases recycling is the best method, as items are easily separated and marketed, as is the case with PET bottles, corrugated cardboard, etc. In some cases, reuse is found to be the ideal choice, such as with textiles. Finally, source reduction may be a focus, as some items may be difficult and expensive to recycle with limited markets, as is the case with polystyrene.

By undertaking continual program evaluation, OCRRA made positive program changes from 2011 to 2013. Recent examples of program additions and expansions include:

- The upgrades of OCRRA's Amboy Compost Site for **commercial and institutional food waste composting**, with the goal of composting 20 million pounds of commercial and institutional food scraps in coming years.
- Change in **Household Hazardous Waste** Collection method from three events per year to a Monday through Friday drop off to be more convenient for residents and eventually remove more hazardous chemicals from the waste stream.
- The **Blue Ribbon Recycler**, a business-recognition program that encourages more paper recycling.
- The continuation of the **School Recycling Pledge**, an innovative school recycling program.
- The introduction of **Extended Producer Responsibility** for mercury thermostats and other difficult to manage waste materials.
- The operation of a **non-ferrous metal recycling system** at OCRRA's Waste-to-Energy Facility, allowing the recycling of hundreds of tons of non-ferrous metal annually.

The last three years of recycling and waste reduction programs in Onondaga County have demonstrated innovation, resilience and creativity. The public education was fine-tuned, additional materials were added to the recyclable list, more recyclable paper was captured and many of OCRRA's programs were recognized nationally and state-wide as among the best. These factors help the community consistently recycle 60% or better of its waste each year. These numerous accomplishments place OCRRA at the forefront of effective and environmentally viable solid waste management.



**APPENDIX 1. 2005 WASTE Q&C:  
SUMMARY OF DISPOSED MUNICIPAL SOLID WASTE\* COMPOSITION**

| Material Components                              | Summary      |                    |                        |                        |
|--|--------------|--------------------|------------------------|------------------------|
|  | Mean         | Standard Deviation | Upper Confidence Limit | Lower Confidence Limit |
| <b>PAPER</b>                                     |              |                    |                        |                        |
| Newspaper  | 3.4%         | 2.7%               | 4.2%                   | 2.7%                   |
| Magazines  | 1.6%         | 1.5%               | 2.0%                   | 1.2%                   |
| Corrugated                                       | 3.9%         | 5.2%               | 5.4%                   | 2.5%                   |
| Corrugated Waxed                                 | 0.7%         | 1.0%               | 1.0%                   | 0.5%                   |
| Gable Top  | 0.2%         | 0.2%               | 0.2%                   | 0.1%                   |
| Aseptic Containers                               | 0.0%         | 0.1%               | 0.0%                   | 0.0%                   |
| Paper Board                                      | 1.7%         | 1.9%               | 2.2%                   | 1.1%                   |
| Books  | 0.6%         | 1.0%               | 0.8%                   | 0.3%                   |
| Office Paper Mixed                               | 3.3%         | 5.0%               | 4.7%                   | 1.9%                   |
| Other Paper (Not recyclable)                     | 12.8%        | 5.4%               | 14.3%                  | 11.3%                  |
| <b>SUBTOTAL:</b>                                 | <b>28.2%</b> |                    |                        |                        |
| <b>PLASTICS</b>                                  |              |                    |                        |                        |
| PET #1 Bottles                                   | 1.0%         | 1.0%               | 1.3%                   | 0.8%                   |
| Bottle Bill - PET #1 Bottles                     | 0.3%         | 0.4%               | 0.4%                   | 0.2%                   |
| PET #1 Containers                                | 0.1%         | 0.2%               | 0.2%                   | 0.1%                   |
| HDPE #2 Bottles Natural                          | 0.4%         | 0.4%               | 0.5%                   | 0.3%                   |
| HDPE #2 Bottles Color                            | 0.5%         | 0.5%               | 0.6%                   | 0.3%                   |
| HDPE #2 Containers                               | 0.2%         | 0.7%               | 0.4%                   | 0.0%                   |
| LHDPE #2   | 1.0%         | 0.9%               | 1.2%                   | 0.8%                   |
| LDPE #4, LLDPE #4                                | 8.6%         | 6.0%               | 10.3%                  | 6.9%                   |
| PVC #3, Poly. #5, #6, #7 (combined) (See Note 1) | 2.4%         | 1.7%               | 2.8%                   | 1.9%                   |
| PVC #3   | 0.0%         | 0.0%               | 0.0%                   | 0.0%                   |
| Polypropylene #5                                 | 0.1%         | 0.2%               | 0.2%                   | 0.1%                   |
| Polystyrene #6                                   | 1.5%         | 0.9%               | 1.8%                   | 1.2%                   |
| Plastic Composites #7                            | 0.2%         | 0.3%               | 0.3%                   | 0.1%                   |
| Other Plastics                                   | 4.6%         | 4.8%               | 5.9%                   | 3.2%                   |
| <b>SUBTOTAL:</b>                                 | <b>19.1%</b> |                    |                        |                        |
| <b>FOOD WASTE</b>                                | <b>14.6%</b> | <b>10.9%</b>       | <b>17.7%</b>           | <b>11.6%</b>           |
| <b>TEXTILES AND LEATHER</b>                      | <b>5.8%</b>  | <b>7.3%</b>        | <b>7.8%</b>            | <b>3.8%</b>            |
| <b>RUBBER</b>                                    | <b>1.0%</b>  | <b>1.9%</b>        | <b>1.5%</b>            | <b>0.4%</b>            |
| <b>DIAPERS</b>                                   | <b>2.4%</b>  | <b>3.0%</b>        | <b>3.3%</b>            | <b>1.6%</b>            |
| <b>FERROUS METALS</b>                            | <b>0.0%</b>  | <b>0.0%</b>        | <b>0.0%</b>            | <b>0.0%</b>            |
| Food / Bimetal Cans / Aerosol Cans               | 1.0%         | 1.0%               | 1.3%                   | 0.8%                   |
| Automobile Parts                                 | 0.8%         | 2.1%               | 1.4%                   | 0.2%                   |
| Other Ferrous                                    | 1.6%         | 3.8%               | 2.7%                   | 0.5%                   |
| <b>SUBTOTAL:</b>                                 | <b>3.5%</b>  |                    |                        |                        |
| <b>NON-FERROUS METALS</b>                        | <b>0.0%</b>  | <b>0.0%</b>        | <b>0.0%</b>            | <b>0.0%</b>            |
| Aluminum Cans                                    | 0.1%         | 0.2%               | 0.2%                   | 0.1%                   |
| Bottle Bill Aluminum Cans                        | 0.2%         | 0.5%               | 0.4%                   | 0.1%                   |
| Aluminum Foil                                    | 0.4%         | 0.4%               | 0.5%                   | 0.2%                   |
| Other Non-ferrous Metals                         | 0.4%         | 0.8%               | 0.6%                   | 0.2%                   |
| <b>SUBTOTAL:</b>                                 | <b>1.1%</b>  |                    |                        |                        |

| Material Components             | Summary |                    |                        |                        |
|---------------------------------|---------|--------------------|------------------------|------------------------|
|                                 | Mean    | Standard Deviation | Upper Confidence Limit | Lower Confidence Limit |
| <b><u>ELECTRONICS</u></b>       | 1.2%    | 2.2%               | 1.8%                   | 0.5%                   |
| <b><u>GLASS</u></b>             | 0.0%    | 0.0%               | 0.0%                   | 0.0%                   |
| Bottle Bill Glass               | 0.3%    | 0.5%               | 0.4%                   | 0.1%                   |
| Clear Glass Containers          | 0.7%    | 0.9%               | 1.0%                   | 0.5%                   |
| Amber Glass Containers          | 0.1%    | 0.2%               | 0.1%                   | 0.0%                   |
| Green Glass Containers          | 0.2%    | 0.6%               | 0.4%                   | 0.0%                   |
| Flat Glass                      | 0.2%    | 0.9%               | 0.5%                   | 0.0%                   |
| Other Glass                     | 0.3%    | 0.7%               | 0.6%                   | 0.1%                   |
| <b>SUBTOTAL:</b>                | 1.8%    |                    |                        |                        |
| <b><u>WOOD</u></b>              | 3.2%    | 3.9%               | 4.3%                   | 2.1%                   |
| <b><u>RUBBLE</u></b>            | 0.6%    | 1.6%               | 1.0%                   | 0.2%                   |
| <b><u>YARD WASTE</u></b>        | 1.2%    | 2.8%               | 1.9%                   | 0.4%                   |
| <b><u>DIRT / FINES</u></b>      | 4.2%    | 3.2%               | 5.1%                   | 3.3%                   |
| <b><u>HAZARDOUS / PAINT</u></b> | 0.0%    | 0.0%               | 0.0%                   | 0.0%                   |
| Household Hazardous             | 0.4%    | 0.8%               | 0.6%                   | 0.2%                   |
| Lead and Dry Cell Batteries     | 0.0%    | 0.1%               | 0.1%                   | 0.0%                   |
| Other Hazardous                 | 0.0%    | 0.1%               | 0.1%                   | 0.0%                   |
| <b>SUBTOTAL:</b>                | 0.5%    |                    |                        |                        |
| <b><u>MISCELLANEOUS</u></b>     | 11.7%   | 6.9%               | 13.6%                  | 9.8%                   |
| <b>TOTAL:</b>                   | 100%    |                    |                        |                        |

\* Commercial and residential data were evaluated separately during the study. This table displays data that is a mean between commercial and residential data.

**NOTE:**

Samples taken during a portion of Monday and Tuesday during the first week were sorted with PVC (#3), Polypropylene (#5), Polystyrene (#6) and Plastic Composites (#7) mixed into a single category. However, these materials were sorted into separate categories beginning on Tuesday and for the remainder of the week. For the samples in which #3, #5, #6, and #7 were collected separately, both the combined and separated data are shown.

Only the combined #3, #5, #6, and #7 is included in the plastics subtotal.

**APPENDIX 2. 2005 WASTE Q&C:  
SUMMARY OF RESIDENTIAL RECYCLABLES COMPOSITION**

| Material Components                | Weighted Mean   | Standard Deviation | Upper Confidence Limit | Lower Confidence Limit |
|------------------------------------|-----------------|--------------------|------------------------|------------------------|
| <b><u>PAPER</u></b>                |                 |                    |                        |                        |
| Newspaper                          | 41.9%           | 7.6%               | 56.8%                  | 26.9%                  |
| Magazines                          | 8.1%            | 4.2%               | 16.3%                  | 0.0%                   |
| Corrugated                         | 11.1%           | 4.8%               | 20.6%                  | 1.6%                   |
| Corrugated Waxed                   | 0.4%            | 1.0%               | 2.4%                   | 0.0%                   |
| Gable Top - Milk Cartons           | 0.5%            | 1.1%               | 2.6%                   | 0.0%                   |
| Aseptic Containers                 | <0.1%           |                    |                        |                        |
| Paper Board                        | 5.6%            | 3.6%               | 12.6%                  | 0.0%                   |
| Books                              | 0.9%            | 1.4%               | 3.7%                   | 0.0%                   |
| Office Paper Mixed                 | 4.3%            | 3.1%               | 10.4%                  | 0.0%                   |
| Other Paper                        | 1.1%            | 1.6%               | 4.2%                   | 0.0%                   |
| <b>SUBTOTAL PAPER</b>              | <b>73.8%</b>    |                    |                        |                        |
| <b><u>PLASTICS</u></b>             |                 |                    |                        |                        |
| PET #1 Bottles                     | 3.1%            | 2.7%               | 8.4%                   | 0.0%                   |
| Bottle Bill - PET #1 Bottles       | 0.2%            | 0.6%               | 1.3%                   | 0.0%                   |
| PET #1 Containers                  | 0.3%            | 0.8%               | 2.0%                   | 0.0%                   |
| HDPE #2 Bottles Natural            | 2.1%            | 2.2%               | 6.4%                   | 0.0%                   |
| HDPE #2 Bottles Color              | 2.8%            | 2.5%               | 7.8%                   | 0.0%                   |
| HDPE #2 Containers                 | 0.2%            | 0.7%               | 1.5%                   | 0.0%                   |
| HDPE #2 Grocery Bags               | 0.1%            | 0.6%               | 1.2%                   | 0.0%                   |
| LDPE #4, LLDPE #4                  | 0.1%            | 0.4%               | 1.0%                   | 0.0%                   |
| PVC #3, Poly. #5, #6, #7           | N/A             |                    |                        |                        |
| PVC #3                             | <0.1%           |                    |                        |                        |
| Polypropylene #5                   | 0.3%            | 0.8%               | 1.9%                   | 0.0%                   |
| Polystyrene #6                     | 0.1%            | 0.6%               | 1.3%                   | 0.0%                   |
| Plastic Composites #7              | 0.1%            | 0.5%               | 1.2%                   | 0.0%                   |
| Other Plastics                     | 0.7%            | 1.3%               | 3.2%                   | 0.0%                   |
| <b>SUBTOTAL PLASTICS</b>           | <b>10.1%</b>    |                    |                        |                        |
| <b><u>FOOD WASTE</u></b>           | <b>0.1%</b>     | <b>0.6%</b>        | <b>1.2%</b>            | <b>0.0%</b>            |
| <b><u>TEXTILES AND LEATHER</u></b> | <b>0.1%</b>     | <b>0.4%</b>        | <b>0.8%</b>            | <b>0.0%</b>            |
| <b><u>RUBBER</u></b>               | <b>&lt;0.1%</b> |                    |                        |                        |
| <b><u>DIAPERS</u></b>              | <b>&lt;0.1%</b> |                    |                        |                        |
| <b><u>FERROUS METALS</u></b>       |                 |                    |                        |                        |
| Food / Bimetal Cans                | 4.5%            | 3.2%               | 10.8%                  | 0.0%                   |
| Automobile Parts                   | 0.0%            | 0.0%               | 0.0%                   | 0.0%                   |
| Other Ferrous                      | 0.1%            | 0.5%               | 1.0%                   | 0.0%                   |
| <b>SUBTOTAL FERROUS</b>            | <b>4.6%</b>     |                    |                        |                        |
| <b><u>NON-FERROUS METALS</u></b>   |                 |                    |                        |                        |
| Aluminum Cans                      | 0.1%            | 0.5%               | 1.2%                   | 0.0%                   |
| Bottle Bill Aluminum Cans          | 0.1%            | 0.4%               | 0.9%                   | 0.0%                   |
| Aluminum Foil                      | <0.1%           |                    |                        |                        |
| Other Non-ferrous Metals           | 0.1%            | 0.6%               | 1.3%                   | 0.0%                   |
| <b>SUBTOTAL NON-FERROUS</b>        | <b>0.4%</b>     | <b>1.0%</b>        | <b>2.3%</b>            | <b>0.0%</b>            |
| <b><u>ELECTRONICS</u></b>          | <b>&lt;0.1%</b> |                    |                        |                        |

| Material Components                    | Weighted Mean | Standard Deviation | Upper Confidence Limit | Lower Confidence Limit |
|--|---------------|--------------------|------------------------|------------------------|
| <b><u>GLASS</u></b>                    |               |                    |                        |                        |
| Bottle Bill Glass                      | 0.7%          | 1.3%               | 3.3%                   | 0.0%                   |
| Clear Glass Containers                 | 6.2%          | 3.7%               | 13.4%                  | 0.0%                   |
| Amber Glass Containers                 | 0.7%          | 1.3%               | 3.2%                   | 0.0%                   |
| Green Glass Containers                 | 1.2%          | 1.7%               | 4.5%                   | 0.0%                   |
| Flat Glass                             | 0.3%          | 0.9%               | 2.1%                   | 0.0%                   |
| Other Glass, Ceramic, Light            | 0.6%          | 1.2%               | 3.0%                   | 0.0%                   |
| <b><u>SUBTOTAL GLASS</u></b>           | 9.7%          |                    |                        |                        |
| <b><u>WOOD</u></b>                     | <0.1%         |                    |                        |                        |
| <b><u>RUBBLE</u></b>                   | <0.1%         |                    |                        |                        |
| <b><u>YARD WASTE</u></b>               | <0.1%         |                    |                        |                        |
| <b><u>DIRT / FINES</u></b>             | 0.8%          | 1.4%               | 3.5%                   | 0.0%                   |
| <b><u>HAZARDOUS/PAINT</u></b>          |               |                    |                        |                        |
| Household Hazardous                    | <0.1%         |                    |                        |                        |
| Lead and Dry Cell Batteries            | <0.1%         |                    |                        |                        |
| Other Hazardous                        | <0.1%         |                    |                        |                        |
| <b><u>SUBTOTAL HAZARDOUS/PAINT</u></b> | <0.1%         |                    |                        |                        |
| <b><u>MISCELLANEOUS</u></b>            | 0.3%          |                    |                        |                        |
| <b>TOTAL</b>                           | 100%          |                    |                        |                        |

*Note:*

PVC #3, Polypropylene #5, Polystyrene #6, and Plastics Composite #7 were sorted into separate categories throughout the second week of the Q&C Study. Therefore, the mixed category above is marked as N/A (not applicable).