North Carolina Solid Waste and Materials Management Annual Report FY 2015-2016

A comprehensive report outlining the state's efforts regarding solid waste and materials management, recycling and the status of waste management facilities, with additional report contributions from the state departments of Administration and Transportation.

Department of Environmental Quality

NORTH CAROLINA SOLID WASTE AND MATERIALS MANAGEMENT ANNUAL REPORT FISCAL YEAR 2015-16

This consolidated annual report is required by the North Carolina General Statute 130A-309.06(c). The report combines annual reports by the N.C. Department of Environmental Quality, including the Solid Waste Management Report, the Scrap Tire Disposal Account Report, the White Goods Management Report, the Electronics Recycling Report, and the Abandoned Manufactured Home Report. This report also includes information from the N.C. Department of Transportation regarding its use of recycled materials in contracts and data from the N.C. Department of Administration on bid procedures and purchases of sustainable and efficient supplies and materials.

Solid waste and materials management information in this report comes from 653 (100 counties and 553 municipalities) local government annual reports and more than 350 solid waste management facilities (including out-of-state facilities). These reports represent activities related to the management of solid waste for the period of July 1, 2015 through June 30, 2016.

Report prepared by:

North Carolina Department of Environmental Quality
N.C. Division of Waste Management
1646 Mail Service Center
Raleigh, N.C. 27699-1646
919-707-8200
http://portal.ncdenr.org/web/wm

North Carolina Department of Environmental Quality
N.C. Division of Environmental Assistance and Customer Service
1639 Mail Service Center
Raleigh, N.C. 27699-1639
919-707-8100
http://portal.ncdenr.org/web/deao

North Carolina Department of Administration
1305 Mail Service Center
Raleigh, N.C. 27699-1301
919-807-4544
http://www.doa.state.nc.us

North Carolina Department of Transportation
1591 Mail Service Center
Raleigh, N.C. 27699-1591
919-733-6837
http://www.ncdot.gov

Nothing Compares

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Executive Summary

The N.C. Department of Environmental Quality shall report to the Environmental Review Commission annually on the status of solid waste management efforts in the state.

The state Division of Waste Management and the state Division of Environmental Assistance and Customer Service report that the population in North Carolina increased by 1 percent in FY 2015-16 (July 1, 2015 - June 30, 2016), while the amount of waste disposed in municipal solid waste landfills and construction and demolition landfills increased by 10 percent. A total of 10,579,912 tons of solid waste generated during the course of FY 2015-16 in North Carolina was disposed at in-state and out-of-state facilities. This represents a net increase in disposal of 944,038 tons from the previous fiscal year.

In FY 2014-15, the state per capita disposal rate was 0.97 tons of waste per person per year. In FY 2015-16, the rate climbed above one ton per capita to 1.05 tons of waste per person per year. North Carolina continues to dispose of solid waste at a lower rate relative to the last decade, where the rate was as high as 1.36 tons of waste per person per year. But annual increases in waste disposal have resumed, likely reflecting the effects of a fully recovered economy.

For the first time in the history of North Carolina's measurement of solid waste disposal, material from Duke Energy coal ash impoundments, 743,822 tons of excavated material, was disposed in lined MSW landfills in Georgia and Virginia. Analysis of the waste stream shows that if waste generated in past decades is included in the calculations, waste from coal ash and other environmental cleanup sites, the waste disposal equals 11,323,734 tons. North Carolina's overall reliance on landfilling thus increased by 17 percent over the previous year.

The movement of coal combustion residuals continues to be an important focus when evaluating disposal trends in North Carolina. Good news, this year, is that large quantities of the waste are increasingly being removed from the waters of surface impoundments at North Carolina power plants and are transported to landfills engineered to be protective of the environment and human health or is transported to recycling facilities for reuse into construction products such as cement, concrete block and wall board.

In FY 2015-16, overall local government recycling tonnage was slightly higher when compared to the previous year. In general, the recent 10-year history of local government recycling efforts reflects a mature public recycling system with a base level of programs, services, and public participation that is holding its own in terms of material captured.

Recycling market prices were flat in FY 2015-16 but showed improvement toward the end of the year. North Carolina also continued to make strides in the expansion of its recycling economy.

Data used in this report, along with other subsidiary reports, is available online at NC DEQ: FY15-16 NC Solid Waste and Materials Management Annual Report.

Key Findings

- The state per capita disposal rate of waste generated during the fiscal year and disposed into MSW and C&D landfills rose to 1.05 tons from 0.97 tons the previous year. This increase in waste disposal likely reflects an economy and consumption patterns that have improved substantially from the recent economic recession.

- Additional disposal of 743,822 tons of excavated CCR during the fiscal year from Duke Energy coal ash impoundments increased North Carolina tonnage reliance on MSW and C&D landfill disposal to 11.3 million tons in FY 2015-16. Excavated coal ash accounts for 44 percent of the overall increase in landfilling in FY 2015-16.

- Waste disposed in North Carolina originating from South Carolina and Virginia was approximately 192,000 tons.

- Remaining capacity of North Carolina landfills equals 29.3 years of waste at present rate of disposal.

- Industrial landfills received over 2 million tons of waste. Industrial waste in North Carolina is predominantly from the electric energy industry (coal combustion residuals or CCR) and from producers of paper products (pulp and paper sludges).

- Coal combustion residuals were mined from an industrial landfill for reuse as synthetic gypsum in the production of drywall and over one million tons was diverted from disposal, for use as a mine reclamation project.

- Preparations continued throughout fiscal year for a possible Avian Influenza outbreak in North Carolina poultry farms and the resultant mortality waste, as well as for the realized season of hurricane and flooding which North Carolina encountered in September of 2016.

- North Carolina local recycling programs saw an overall increase in total tonnage, but experienced a slight 1.4 percent decline in the recovery of traditional household recyclable materials in FY 2015-16 over the previous year, reflecting a gradual lightening of the recyclables stream as fewer household consume newspaper and other fiber products.

- North Carolina reached the highest rate of citizens served by curbside recycling programs to date in 2015-16 with 1.964 million households receiving collection from 326 local curbside programs.

- Material values for a wide range of commodities remained relatively low in FY 2015-16, creating challenges for Material Recovery Facilities and other recyclers.

Departmental Considerations and Recommendations

- The General Assembly should consider ways to support the increased recovery and recycling of wastes which are needed by North Carolina manufacturers and material processors.

- The General Assembly should consider evaluating the producer responsibility components of the state's electronics legislation to better support local recycling programs.

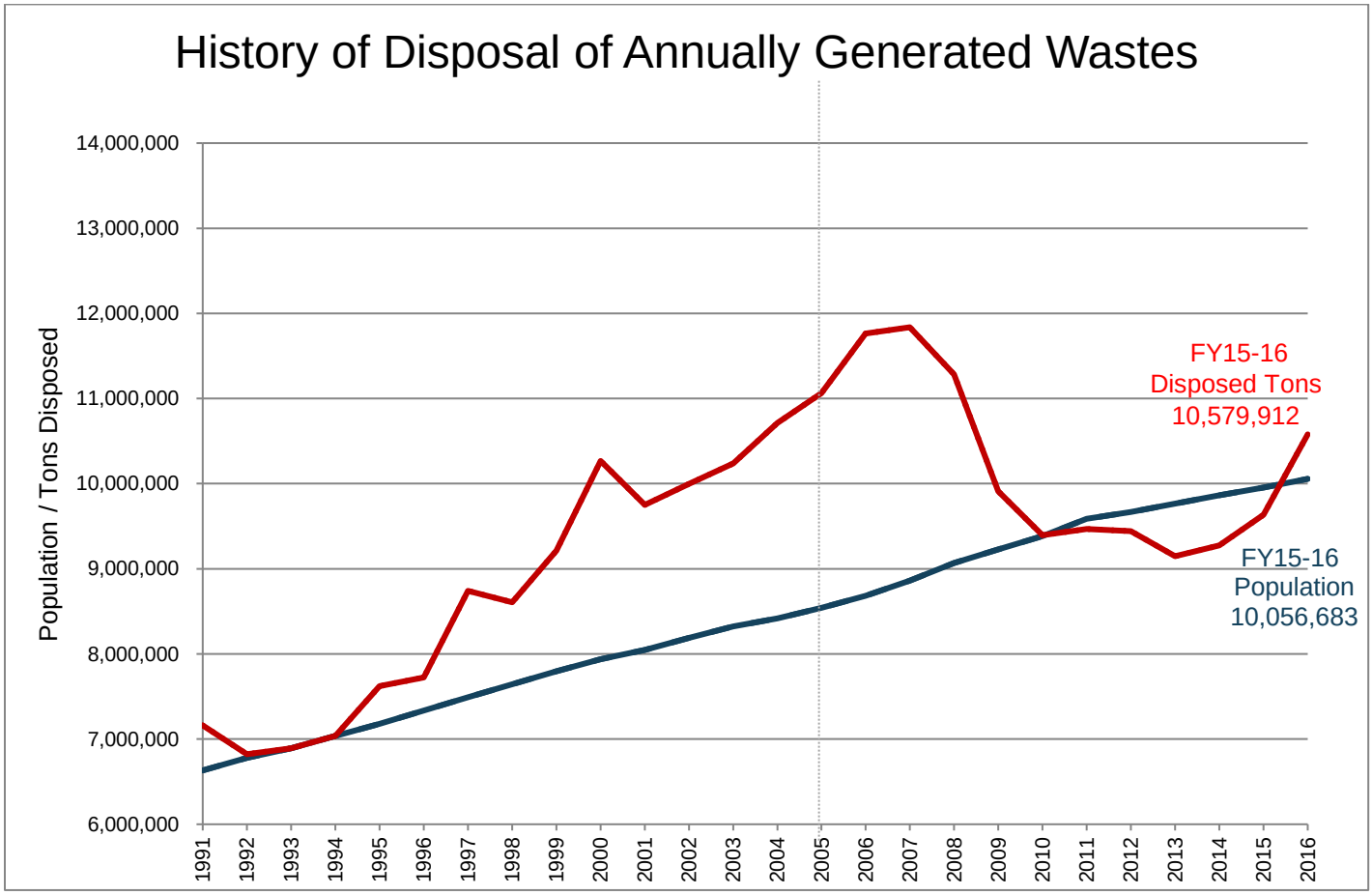
Chapter 1
Department of Environmental Quality - Solid Waste Management

Waste types handled at North Carolina facilities include municipal solid waste, industrial waste, construction and demolition waste, land-clearing waste, scrap tires, medical waste, compost, and septage.

Coal combustion residuals, or CCR, generated at North Carolina's electric power plants, have received much study and attention because of the Coal Ash Management Act of 2014 which requires that the surface water disposal impoundments be removed and the ash be placed into lined landfills or recovered. In past years CCR has primarily been disposed of into industrial landfills on site at power plants. Increasingly in North Carolina CCR is being sent to recyclers, structural fills, and to MSW landfills. This report includes an analysis of CCR wastes impact on North Carolina disposal and recovery. For additional information regarding CCR please see the *Quarterly Report(s) to the N.C. Environmental Review Commission on Operations, Activities, Programs and Progress Relating to Coal Combustion Residuals Surface Impoundments*

Municipal Solid Waste (MSW) and Construction and Demolition (C&D) Landfill Disposal

North Carolina disposed of a total of 10,579,912 tons of waste that was generated during the fiscal year into municipal solid waste [MSW] and construction and demolition [C&D] landfills located within the state and out-of-state. This represents an increase of 944,038 tons of waste from the previous fiscal year going into MSW and C&D landfills. The chart below displays the history of disposal of waste since 1991. For each fiscal year, tonnage figure it represents the material that was generated during that year that entered disposal facilities.



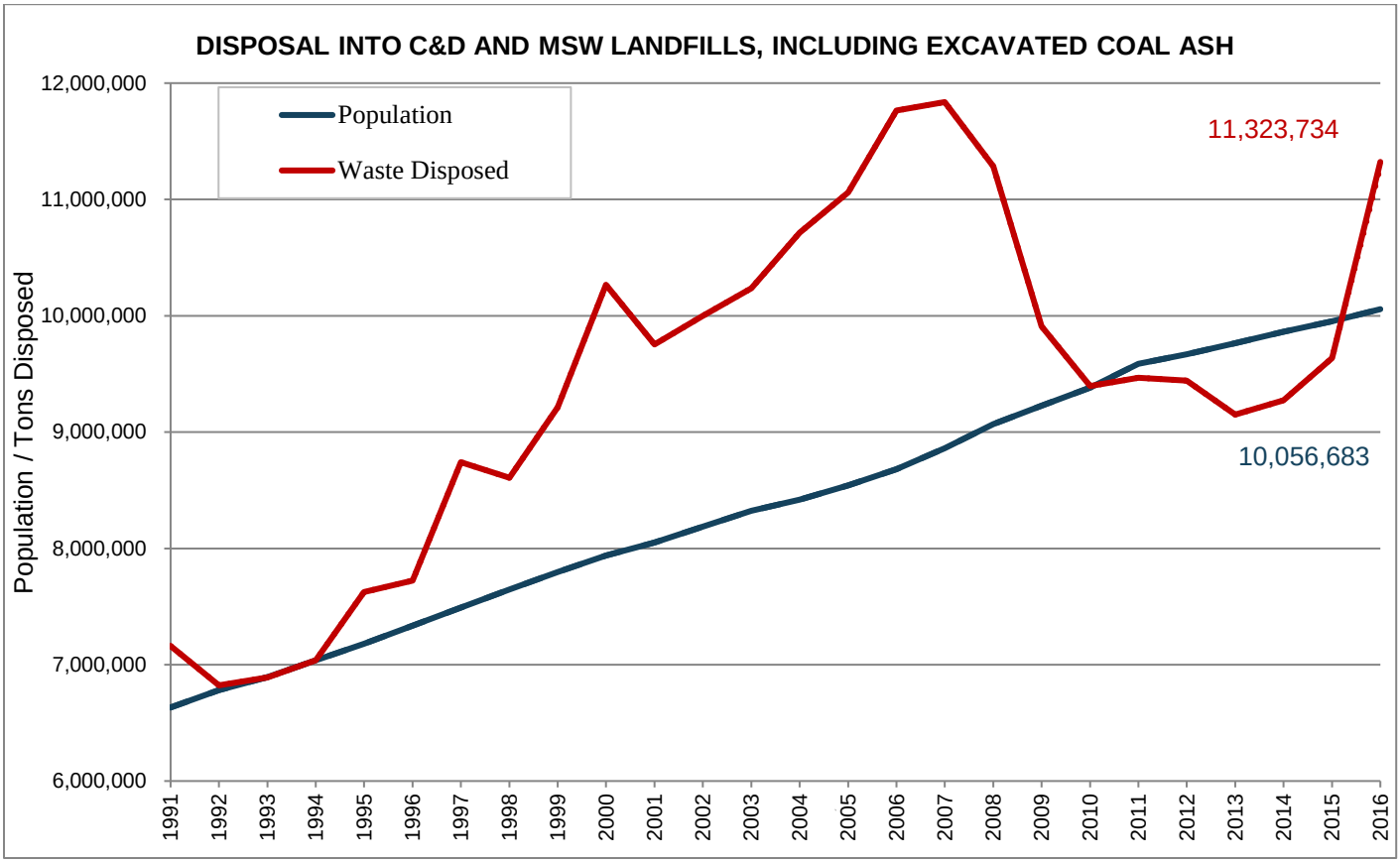
In addition to normal MSW and C&D wastes, other post-industrial or business cleanups which are going to safe disposal into lined MSW landfills include petroleum contaminated soils from leaking storage tanks, as part of the Division of Waste Management's Underground Storage Tanks Section, and wastes from development at industrial facilities, as part of the Division of Waste

Management's Brownfield Program. In past years, the cleanup from hurricanes Fran and Floyd, created noticeable spikes in the waste disposed into landfills; it is expected that, due to Hurricane Matthew, a similar waste increase will be apparent in the FY 2016-17 reporting.

A significant new development in waste disposal in FY 2015-16 is due to the quantities of coal combustion residuals (CCR) that have been excavated from impoundments managed by Duke Energy so the residuals could be safely disposed of in lined municipal solid waste and industrial landfills, as required by the Coal Ash Management Act of 2014. This year the total amount of waste generated in North Carolina included 863,799 tons of coal combustion residual waste (119,978 production ash and 743,822 cleanup ash), from six electrical plants, which was disposed into MSW landfills in North Carolina, Virginia and Georgia. Coal ash going into landfills accounts for eight percent of total waste disposal into MSW and C&D landfills this fiscal year. Exclusive of CCR waste which was generated in past decades, North Carolina disposed of a total of 10,523,392 tons of waste in municipal solid waste [MSW] and construction and demolition [C&D] landfills located within the state and out-of-state. This represents an increase of 887,518 tons of waste from the previous fiscal year going into MSW and C&D landfills.

Other post-industrial or business cleanups which are going to safe disposal into lined MSW landfills include petroleum contaminated soils from leaking storage tanks, as part of the Division of Waste Management's Underground Storage Tanks Section, and wastes from development at industrial facilities, as part of the Division of Waste Management's Brownfield Program. In past years, the cleanup from hurricanes Fran and Floyd, created noticeable spikes in the waste disposed into landfills; it is expected that a similar waste increase will be apparent in the FY 2016-17 reporting.

The chart below provides a second perspective on North Carolina's dependence on landfill disposal that includes both wastes generated during fiscal year plus excavated coal ash material. It is unclear how long the use of MSW landfills for excavated impoundment CCR might last but the chart shows that excavated coal significantly increased overall use of landfill space in FY 2015-16.



Coal Combustion Residual (CCR) and Product (CCP) Generation, Disposal and Reuse

The following table shares information on the disposition of coal combustion wastes that intersected with landfill disposal. The information is derived from reporting of the nine industries which generate ash at their coal burning power plants across North Carolina.

Energy Generator Annual Reporting	Waste (tons) generated at power plants FY 2015-16		Ash (tons) excavated from impoundment
	Ash	FGD	
Total produced	1,501,317	1,148,712	
Used in Structural Fill	14,184	26,385	1,123,547
Other Beneficial Uses	489,510	1,151,701	393,933
Disposed in MSW Landfills	123,396	0	743,822
Disposed in Industrial Landfills	874,227	35,696	0
Disposed in Basins	0	-	-

Recycling efforts continue to increase at industrial facilities statewide.

- CCP in the form of ash is predominantly reused as an ingredient in cement.
- Session Law 2016-95, the Coal Ash Management Act revised, required that the Duke Energy provide ash beneficiation projects capable of processing 300,000 tons of ash, reclaimed from surface impoundments, for cementitious products.
- Duke Energy has specified that the first two sites will be located at the Buck Station (Spencer, NC) and HF Lee Station (Goldsboro, NC). By July of 2017 another suitable site must be identified for a beneficiation project.
- Fly ash, slag and bottom ash, can be utilized as construction materials such as gravel or fill.
- 1,105,401 tons of CCP were used for permitted mine reclamation at the Chatham County Brickhaven Structural Fill.
- Flue gas desurphurization residuals, or synthetic gypsum, is the primary ingredient in drywall.
- Duke Energy reported in FY 2015-16 that 393,933 tons of gypsum was sent to the drywall or wallboard industry for reuse.
- 114,508 tons of gypsum was mined from the Belews Creek landfill in Surry County for reuse.

Solid Waste Tax

The N.C. Department of Revenue reported solid waste tax collection of $19,226,981, which equates to 9,613,491 tons of taxable solid waste going into landfills within North Carolina and through transfer stations to landfills in neighboring states. The gap between reported disposed tonnage and tax-paid tonnage was due to waste at federally-owned landfills on military bases and some specific waste streams received at MSW facilities (for example, biosolids) that are exempt from the solid waste tax. In addition, the large amount of excavated CCR impoundment wastes were not taxed because they were not transferred through a permitted solid waste facility.

Revenue from the solid waste tax was distributed to:

- Inactive Hazardous Sites Cleanup Fund - 50 percent is used to fund the assessment and remediation of pre-1983 landfills,
- Local Governments – 18.75 percent to counties and 18.75 percent to municipalities to assist them with their waste and materials management programs, and General Fund – 12.5 percent

Disposal Material Profile and Per Capita Disposal History

The table below provides additional detail on the major components of North Carolina's landfilled waste in FY 2015-16, accounting for all major waste streams, including materials not subject to the disposal tax and excavated impoundment CCR.

Material Type	

Taxable Tonnage Disposed in MSW Landfills, excluding Generated and Excavated Coal-Fired Power Plant Combustion Wastes.	8,191,813 (7,613.129 tons to in-state landfills+ 578,684 tons to out of state landfills)
Taxable North Carolina C&D Disposed in C&D Landfills	1,491,787 (1,479,626 tons to in-state landfills+ 12,161 tons to out of state landfills)
Tax Exempt Materials (e.g., biosolids) disposed in MSW Landfills	728,977
Tax Exempt Materials disposed in C&D Landfills	6,138
Coal-Fired Power Plant Combustion Wastes *Generated* in FY2015-16 and Disposed in MSW Landfills	123,396
Materials *Excavated* from Coal Combustion Impoundments in FY 2015-16 Disposed in MSW Landfills	743,822

The following table shows the history of North Carolina's per capita disposal rate, including the impact of including excavated CCR on that rate. The table shows the baseline measurement of solid waste disposal in the benchmark years of FY1990-91 and 1991-92 as well as the most recent eleven fiscal years. Two calculations were performed to determine per capita waste this fiscal year, one showing disposal per capita for wastes generated during the fiscal year and the other including both generated waste plus excavated CCR.

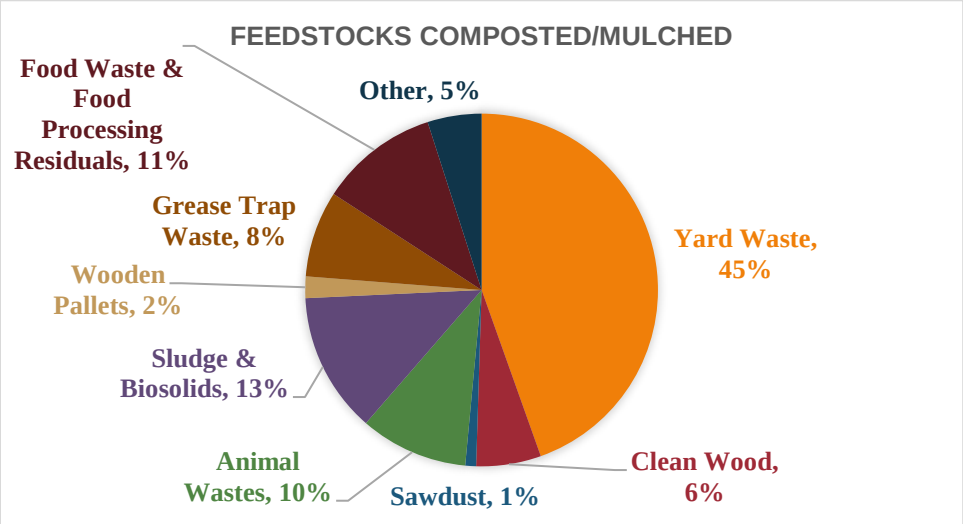
Fiscal Year	Tons of waste disposed	NC population	Tons of waste per person in a year
2015-16 with excavated coal ash	11,323,734	10,056,683	1.12
2015-16 minus excavated coal ash	10,579,912	10,056,683	1.05
2014-15	9,635,874	9,953,687	0.97
2013-14	9,273,571	9,861,952	0.94
2012-13	9,149,130	9,765,229	0.94
2011-12	9,443,380	9,669,244	0.98
2010-11	9,467,045	9,586,227	0.99
2009-10	9,395,457	9,382,609	1.00
2008-09	9,910,031	9,227,016	1.07
2007-08	11,284,712	9,069,398	1.24
2006-07	11,837,104	8,860,341	1.34
2005-06	11,765,183	8,682,066	1.36
1991-92 benchmark year	7,257,428	6,781,321	1.07
1990-91	7,161,455	6,632,448	1.08

Municipal Solid Waste Landfill Capacity

The total remaining capacity of all North Carolina MSW landfills measures approximately 394 million cubic yards, equating to approximately 245 million tons, an increase from last year. This estimate was calculated using 0.62 tons of waste per cubic yard of air space. The capacity does not include waste exported to out-of- state landfills. The state capacity equals 29.3 years of waste disposal if North Carolina's rate of landfill use remains steady at approximately 8.4 million tons per year. Continued efforts to increase recycling and material diversion should help the state maintain a strong landfill capacity. Much of the state's capacity is not available statewide due to permit conditions, franchise arrangements, service areas and distances. Although overall state capacity is sufficient, some regions have limited waste disposal capacity. Those areas may experience higher disposal costs and possible disruptions in service as facilities close or fuel costs make transport of waste to distant facilities prohibitive.

A significant new development in waste disposal in FY 2015-16 was the first major instance of large-scale excavation of previously-generated coal combustion waste from surface impoundments and the disposal of that material into lined MSW landfills, as required by the Coal Ash Management Act of 2014. The material was excavated in Buncombe and Rockingham counties and disposed in out-of-state facilities in Georgia, South Carolina, and Virginia.

As excavation activities likely continue over time, and as that material makes use of MSW landfill capacity in and out of state, its impact on overall disposal should be recognized. Disposal of MSW, annually generated coal combustion waste, and excavated coal combustion waste will likely start to intersect and where specific data is available, this report can begin to specifically account for each material type.



Industrial Landfill Disposal

In North Carolina there are 15 industrial landfills permitted to receive various kinds of industrial waste. In North Carolina this past year 2,072,123 tons of waste from on-site industrial complexes went into industrial landfills. All of these landfills except one are at the facility which produces the waste. The largest volume of waste disposed into industrial landfills is at electric power plants and consists of coal combustion residual. The paper product industry, which disposes sludge and wood ash, is secondary in volume. Tabulation of industrial waste into monofills can be found at: NC DEQ: FY15-16 NC Solid Waste and Materials Management Annual Report.

Composting

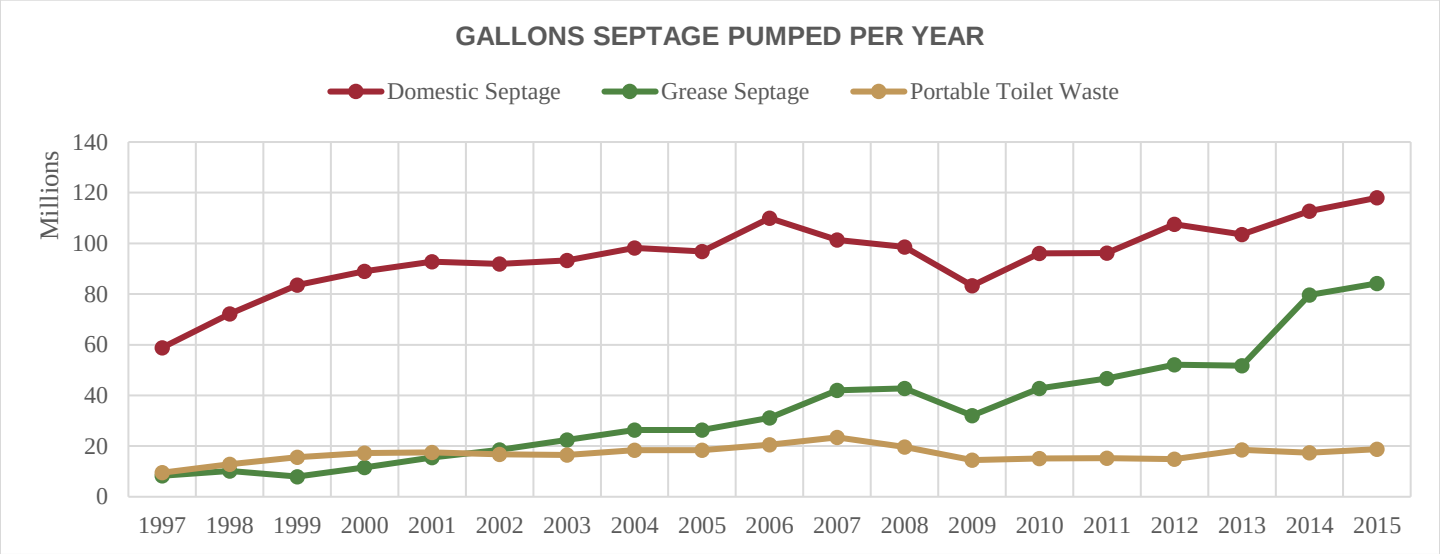
Compost facilities continued to divert organics from the municipal solid waste stream. Fifteen solid waste compost facilities accepted 34,263 tons of yard waste, wood waste, biosolids, and other wastes, as depicted in the graph to the left. An additional 18,469 tons of food residuals, produced from industrial food processors, were accepted by solid waste compost facilities.

Facilities reported that they processed over 480,000 tons of feedstocks to create compost and mulch this year. Although food waste diversion continues to grow in importance, it currently only makes up 11 percent of feedstocks processed, an increase of two percent over last year. There is significant opportunity to increase food waste diversion in North Carolina.

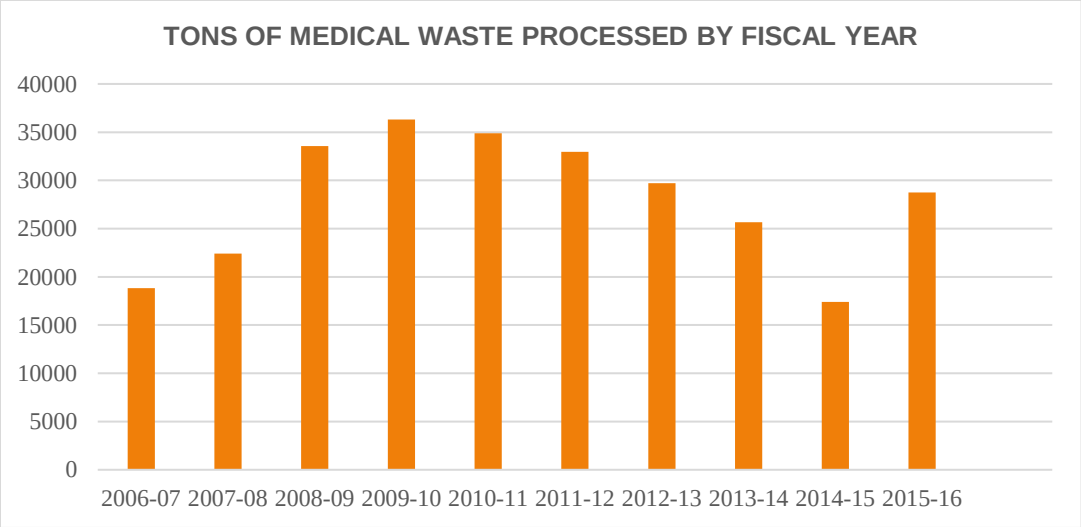
Land Application

Land application of septage waste is accomplished through staff permitting and compliance activities for over 500 septage haulers, 19 storage detention and treatment (dewatering) facilities, and 123 land application sites (representing 1,858 acres). The majority of the land-applied waste is septic tank, portable toilet, and restaurant grease trap waste, although the program also assists waste generators with other wastes and by-products to determine if they are suitable for beneficial use through land application. Examples of beneficially reused waste includes wood ash and tobacco dust. Best management practices are followed for each by-product to assure protection of public health and the environment after evaluation by staff and are inclusion in the site operational plans.

The volumes of septage pumped in 2015 exceeded the previous industry high in 2006. The three septage streams, domestic septage, grease septage, and portable toilet waste, totaled 220,920,348 gallons of septage pumped in 2015. Grease septage volumes managed by permitted septage firms continue to increase, in part due to local government programs that require restaurants to have their grease traps pumped on a frequent basis.



Medical Waste



During the FY 2015-16, North Carolina saw the gain of two commercial medical waste treatment providers. This now brings the number of treatment providers to seven. In addition, the section approved the use of an alternative medical waste treatment technology which employs shredding and steam to treat the waste. This now brings the number of alternative treatment technologies approved for use in this state to 18.

The graph shows that the tonnage of medical waste treated at North Carolina's commercial waste treatment facilities has increased in the last fiscal year. Approximately 17,000 tons of medical waste from North Carolina and 12,000 tons from other states was treated at in-state medical waste treatment facilities. This was a reversal in waste origin from the previous year. The above chart does not show the medical waste generated or treated at medical facilities, such as hospitals and physician offices. Medical facility waste generation or treatment is under the regulations of the Department of Health and Human Services.

Household Hazardous Waste

Household hazardous wastes (HHW) are household chemicals that are poisonous and/or toxic, ignitable, corrosive or reactive with other chemicals. HHW includes items such as pharmaceuticals, household cleaners, pesticides, herbicides, fertilizers, pool chemicals, paints, automotive fluids and batteries, among others. These chemicals are dangerous to human health and the environment. The Solid Waste Section recommends that citizens properly dispose of HHW at an approved collection site. Local HHW collection sites may be temporary, one-day events or permanent ongoing collection sites.

Of the 100 counties in North Carolina, only 19 have permanent HHW collection sites (23 sites total). These 19 counties alone collected 9,470,997pounds (4736 tons) of HHW among which were:

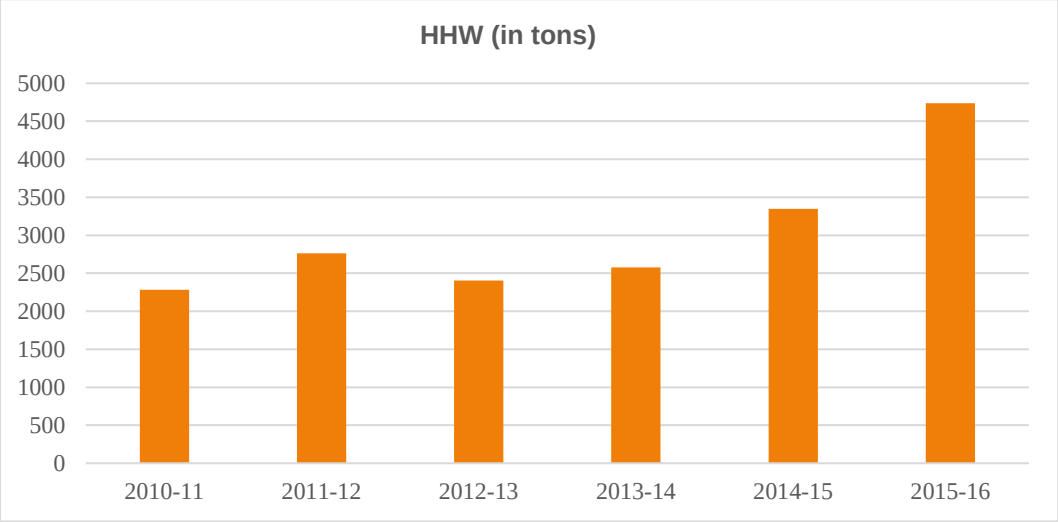
- 3,831,497 pounds of various paints;
- 592,366 pounds of flammable liquids;
- 346,704 pounds of automotive fluids and filters;

- 133,465 pounds of various lead-acid, cadmium, lithium and alkaline batteries,
- 116,281 pounds of mercury containing fluorescent light bulbs;
- 303,708 pounds of compressed gasses;
- 227,775 pounds of poisonous materials such as insecticides, herbicides and fungicides;
- 130,194 pounds of corrosive materials;
- 51,811 pounds of flammable solids;
- 88,405 pounds of oxidizing substances; and
- 97,179 pounds of other non-specific regulated hazardous wastes.
- 199,772 pounds of non-regulated unspecific wastes.

Counties tallied 85,668 visits to permanent HHW facilities by citizens.

Thirty-one counties, 4 municipalities, 3 private firms and one school district held 40 temporary one-day collection events. Of the forty events held, 13 events reported total collections of 163,556 pounds (82 tons) of chemical HHW.

A complete listing of locations of permanent HHW sites as well as one-day events can be found at **http://deq.nc.gov/about/divisions/waste-management/waste-management-permit-guidance/solid-waste-section/household-hazardous-waste**



Although the collection of HHW is a costly endeavor, increasing numbers of local governments, as well as civic organizations and private industries, are arranging for this valuable service for North Carolina communities.

Facility Inspections

The department is responsible for conducting inspections/site visits at the following variety of solid waste management facility types.

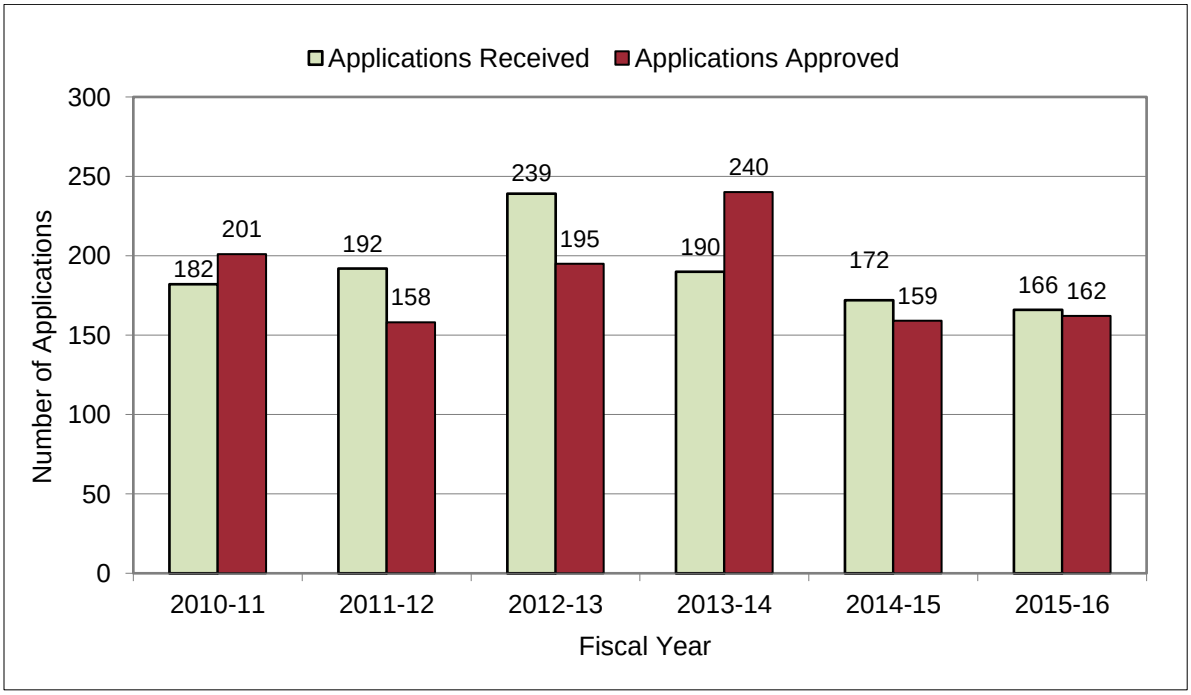
- C&D Landfills over MSW Landfills
- Closed Post-Closure Landfills
- Compost Facilities
- Construction & Demolition Landfills (C&DLF)
- Industrial Landfills
- Land Application Sites
- Land Clearing and Inert Debris Landfills (LCID)
- LCID Notification Landfills (open and closed)
- Municipal Solid Waste Landfills (MSWLF)
- Transfer Stations
- Treatment and Processing Facilities (T&P)
- Yard Waste Notifications
- Coal Combustion Product Landfills and Structural Fills
- Compost Demonstrations
- Household Hazardous Waste Collection Sites
- Material Recovery Facilities
- Medical Waste Treatment Facilities and Incinerators
- Septage Detention and Treatment Facilities
- Septage (hauler) Firms
- Tire Monofills
- Tire Processing / Collection Facilities
- White Goods Collection

Non-Facility Inspections and Evaluations

In addition to the facility types listed above, the department also provides inspections and evaluations for the following:

- Illegal Dumping: The department investigates complaints of illegal dumping of solid waste, working to have the sites cleaned up and taking enforcement action when necessary for the protection of human health and the environment.
- Disaster Response and Preparation: The department continues to work with local governments to foster the message that disaster preparedness is essential, given the history of storm destruction in North Carolina. The department evaluates potential sites for the temporary storage of vegetative and demolition debris following an emergency or disaster until waste can be properly disposed of. Beginning in late September 2016 through the end of the year, the department dedicated a great deal of staff time and resources to preparation, response, and clean-up for Hurricane Matthew, including working to update and improve the GIS map of approved sites to provide it to the North Carolina Department of Emergency Management. A more detailed summary of the response efforts will be provided in the Annual Report for FY 2016-2017.
- Tax Certifications: The department processes applications for certification for special tax treatment of facilities and equipment used in the recycling/resource recovery of or from a solid waste at no cost to the applicant. The department has recently made internal changes to the process to reduce paper waste and expedite the processing time of applications.

Tax Certification Applications Received and Approved



Facility operator training and public outreach

The Solid Waste Section is committed to the protection of public health and the environment through education, inspections and compliance, and environmental monitoring. The section has a long-standing history of promoting training for the regulated community and the public as required by statute, as well as through technical assistance, collaboration, outreach activities, and customer service.

- Landfill Operators and Managers Training
- Transfer Facility Operators Training
- Septage Firm Operator Training
- Septage Annual Operator Training
- Disaster Debris Management Presentations
- Regional Roundtable Discussions
- NC Solid Waste Enforcement Officer Association (NC SWEOA), NC and Quad State Solid Waste Assn of North America (SWANA), NC Composting Council Conference (NCCC) Presentations
- Coal Combustion Residuals Landfill Operator Training

Chapter 2
Department of Environmental Quality - Local Government Waste Reduction Activities and Recycling Markets

Annual reports received from local governments provide data on public source reduction, reuse, recycling and composting activities statewide as well as other aspects of solid waste management. Data from these reports helps produce a picture of waste reduction, recycling and materials management efforts in North Carolina. This data offers information that helps gauge the breadth and relative effectiveness of local government programs in diverting materials from disposal and delivering them to industry for reprocessing. Data from these annual reports also helps document the trends in recycling and reuse program implementation and the evolving nature of public materials recovery efforts in North Carolina.

Source Reduction and Reuse Programs

The total number of local governments operating a source reduction and/or reuse program during Fiscal Year 2015-16 dropped when compared to the previous year, down to 94 communities reporting that they operate some sort of program to help their citizens reduce the amount of waste they produce or to reuse materials instead of discarding them. Operating a source reduction or local reuse program can be a cost effective way to help citizens reduce the amount of solid waste that is discarded. These programs are typically popular with residents and have the potential to be a low-cost opportunity to engage a community, creating awareness about strategies that can be used to reduce the cost of disposal. However, only a minority of local governments operate these programs and in general waste prevention seems to be a low priority for most communities.

Local Source Reduction / Reuse Programs					
Program Type	**FY 2011-12**	**FY 2012-13**	**FY 2013-14**	**FY 2014-15**	**FY 2015-16**
Backyard Composting Programs	56	51	52	49	42
Source Reduction Programs	86	81	71	73	71
Public Reuse Programs	48	39	46	45	41
Total Local Governments with Source Reduction or Reuse Programs	113	107	108	108	94

Local Government Recovery

The following table documents local government materials recovery operations over the past 10 years. Overall, local government recovery showed a slight increase in FY 2015-16 when compared to the previous year. This increase can mostly be attributed to the increased recovery of metal and construction and demolition debris. In general, the recent 10-year history of local government recycling efforts, as reflected in the tonnage results, paints a picture of steady performance, with no dramatic swings up or down but only slight fluctuations. This reflects a mature public recycling system with a base level of programs, services and public participation that is holding its own in terms of material capture, even as the "evolving ton" of traditional recyclables generated in households becomes lighter over time. Highlights from the table below will be examined in greater detail later in this chapter.

Local Government Recovery (Tons) and Performance Measures					
Material	**FY 2006-07**	**FY 2007-08**	**FY 2008-09**	**FY 2009-10**	**FY 2010-11**
Total Paper	305,615	321,019	342,008	343,031	347,622
Total Glass	51,883	56,837	69,446	75,124	86,163
Total Plastics	19,373	22,298	23,947	29,206	36,047
Total Metal*	96,884	84,740	69,242	61,251	57,681
Total Organics**	631,393	554,576	593,323	589,482	635,495
Special Wastes***	8,304	7,195	8,433	7,225	7,085
Electronics and Televisions***	N/A	N/A	N/A	4,574	7,452
Construction and Demolition Debris	40,352	59,501	33,209	20,832[t]	26,303[t]
Tires****	187,273	142,160	147,055	119,177	97,323
Other	5,558	6,753	8,474	1,948	1,098

Totals	**1,346,635**	**1,255,079**	**1,295,137**	**1,251,848[t]**	**1,302,27[t]**
Per Capita Recovery (lbs.)	**303.97**	**276.77**	**280.73**	**266.84[t]**	**271.70[t]**
Recovery Ratio (Recycling:Disposal)	**0.11**	**0.11**	**0.13**	**0.13[t]**	**0.14**

Local Government Recovery (Tons) and Performance Measures *(continued)*

Material	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Total Paper	344,758	321,819	318,183	336,899	325,539
Total Glass	96,819	117,237	115,997	121,371	124,936
Total Plastics	36,670	39,322	44,407	45,374	45,975
Total Metal*	51,545	51,662	49,525	51,736	62,389
Total Organics**	706,560	604,889	842,282	757,778	735,367
Special Wastes***	6,961	6,496	6,870	7,053	7,391
Electronics and Televisions***	14,688	14,160	14,786	15,076	16,682
Construction and Demolition Debris	93,858[t]	71,225	86,311	88,714	114,649
Tires****	121,552	120,013	136,943	151,069	145,122
Other	1,616	1,725	1,061	951	1,483
Totals	**1,475,028[t]**	**1,348,548**	**1,616,334**	**1,576,021**	**1,579,532**
Per Capita Recovery (lbs.)	**305.10[t]**	**276.19**	**327.79**	**316.67**	**314.13**
Recovery Ratio (Recycling:Disposal)	**0.16**	**0.15**	**0.18**	**0.16**	**0.15**

* Includes white goods, aluminum cans, steel cans and other metals.

** Includes yard waste, pallets, wood waste and food waste.

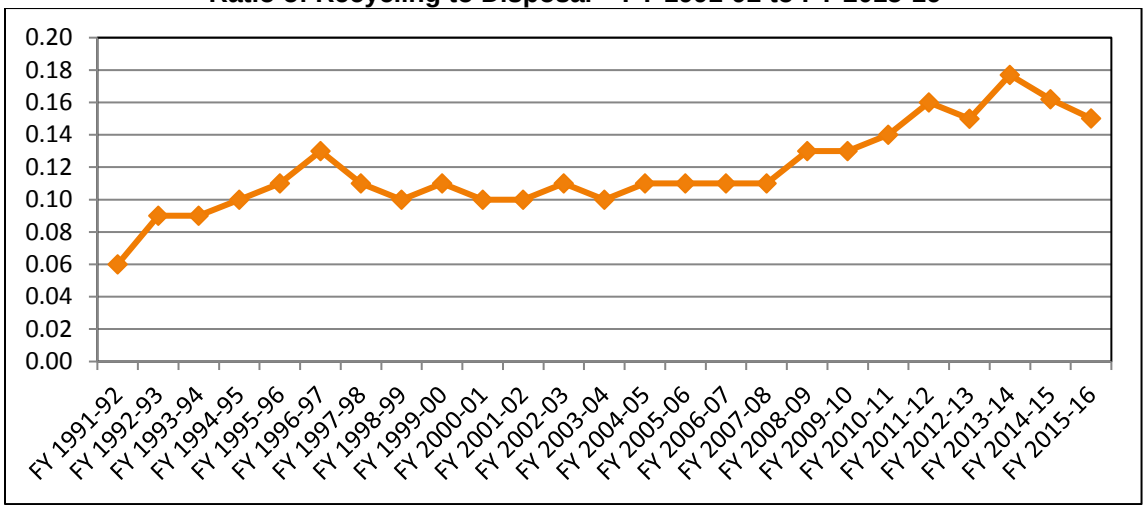
*** For FY 2000-01 through FY 2008-09 Special Wastes includes electronics, used oil, oil filters, antifreeze, paint and batteries. Beginning in FY 2009-10 and beyond Special Wastes excludes electronics and includes recovery from the programs described in the Special Waste Management section in this chapter.

**** For FY 2010-11 and beyond the tons of tires listed as recovered includes only those tires originating from within North Carolina that were processed in NC. Data on the recovery of NC originated tires that were exported outside of the state is not available. In FY2009-10, the tire recovery figure inadvertently included some tires from out-of-state sources and in fiscal years prior to FY 2009-10 the tires figure reported included all tires recovered at the private tire facilities in NC, including those tires received at those facilities from sources outside of NC.

[t] C&D Debris Tonnages, Total Recovery, and Per Capita Recovery for FY 2009-10, 2010-11, and 2011-12 were all revised in 2013 as a result of decreased C&D Debris Recovery due to reporting errors. This change also resulted in a revised Recycling:Disposal Recovery Ratio for FY 2009-10.

The ratio of local government recycling to overall state disposal is used to examine the success of public recycling program materials recovery efforts from year-to-year relative to landfilling. For FY 2015-16, the ratio of recycling to disposal decreased when compared to FY 2014-15. Considering that total public recovery increased slightly over the previous year, the primary factor contributing to this result is a substantial increase in overall disposal in FY 2015-16 when compared to FY 2014-15. Excluding excavated coal ash, North Carolina sent 10,579,912 tons of material to MSW landfills in FY 2015-16. This increase from the total disposal of 9,635,875 tons of waste in MSW landfills in FY 2014-15 can mostly be attributed to increased economic activity in North Carolina along with a growing population. The following chart demonstrates the changing ratio of materials recovery when compared to disposal in North Carolina and highlights the overall increasing relevance of materials recovery through the past decades.

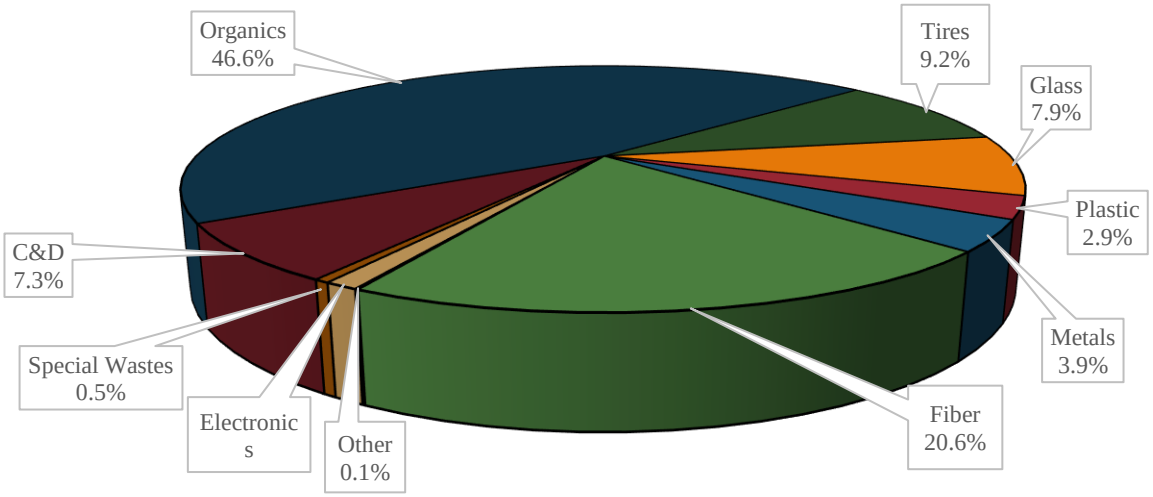
Ratio of Recycling to Disposal – FY 1991-92 to FY 2015-16



Recovery of Particular Materials

Public recycling programs play an important role in providing recovered materials to the supply chain for private manufacturing. The following chart provides a material-specific look at those materials diverted from disposal to economic use by local government recovery operations in FY 2015-16.

Characterization of Local Government Recovery



The single largest category of material recovered by local governments continues to be organics. This category includes vegetative debris, clean wood (unpainted and untreated dimensional lumber), pallets, food waste, and oyster shells. The recovery of vegetative debris (or Yard Waste) is accomplished through public and private mulching and composting, though boiler fuel and other energy markets are also an important destination for yard waste collected by local governments. For a detailed look at the management of Yard Waste in FY 2015-16, please see the section titled Yard Waste Management later in this chapter. The annual recovery of organic materials can be erratic because the largest component of the organics stream, Yard Waste, can vary widely from one year to the next as a result of weather conditions and storm events. During FY 2015-16 organics constituted a little less than 47 percent of the total local government recovery. Fiber, or paper products, and tires were the next two largest categories of materials recovered, contributing 20.6 percent and 9.2 percent respectively.

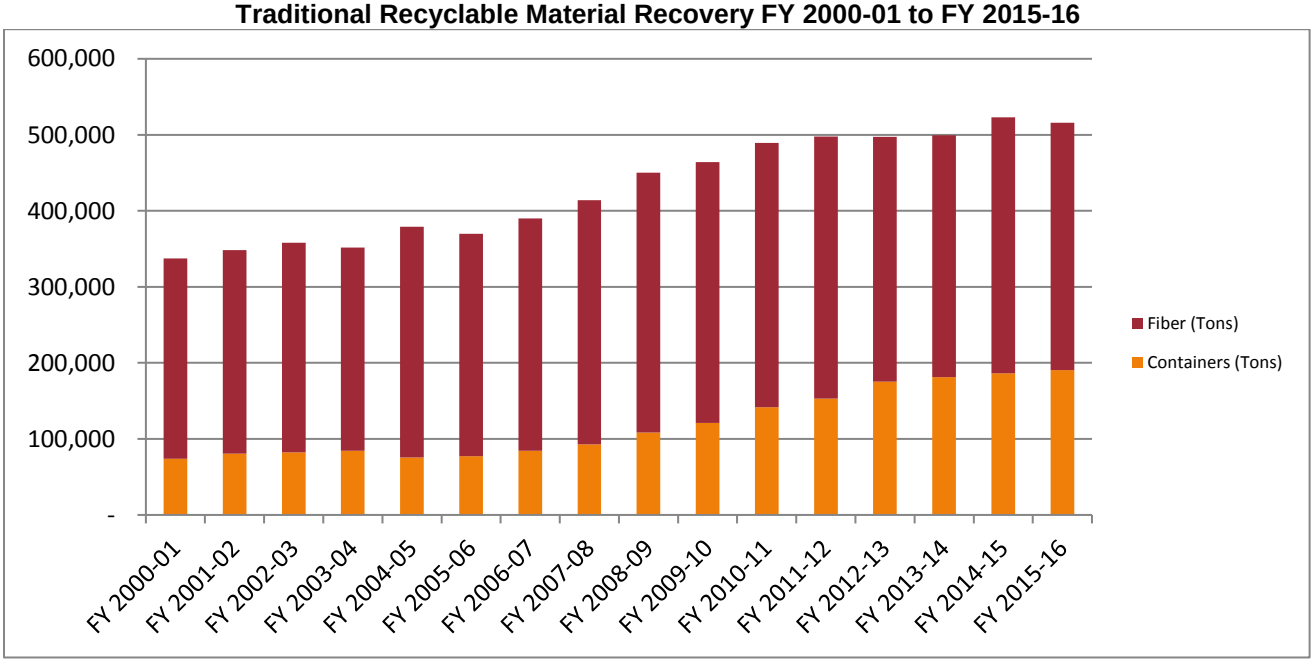
Recovery of Traditional Materials

Traditional recyclable materials are the items or materials that most citizens think of when reflecting on recycling. These materials include fiber or paper (corrugated cardboard, magazines, newspapers, office fiber and residential mixed paper) and containers (aluminum beverage cans, glass bottles and jars, plastic bottles and containers and steel food containers). These materials are common in the home, though they are also found in the workplace, in bars and restaurants, and in away-from-home settings such as parks and other public venues.

An examination of the recovery of traditional materials by public recycling programs in FY 2015-16 reflects a 1.4 percent decline when compared to the previous year. This decline is largely driven by the decreased recovery of paper products, particularly of newspaper and corrugated cardboard, though it may also be attributed to the continued efforts by consumer product manufacturers to reduce the weight of packaging, in particular plastic bottles and metal cans. The overall public recovery of fiber is down from the high point seen in FY 2010-11, when local governments collected nearly 350,000 tons of paper and when paper represented 71.1 percent of the traditional materials managed by public programs. In comparison, during FY 2015-16 paper represented just 63.1 percent of traditional materials recovered. The decreased recovery of paper products should not necessarily be seen as a failure on the part of public recycling programs, and instead is likely a reflection of the reduced overall consumption of printed paper as illustrated by the decline in the circulation of newspapers and magazines.[1] The paper portion of traditional materials recovery in North Carolina has seen a steady decline over the past decade, from a high of 80.1 percent in FY 2004-05. The changing make-up of traditional materials recovery is known in the recycling industry as the "evolving ton," and this phenomenon is not unique to North Carolina. Materials processors across the country have had to reconfigure their Materials Recovery Facilities (MRFs) to more effectively manage the mix of materials delivered to them by public recycling programs and in particular to better handle the increased proportion of container materials.

The following chart documents the trend in the recovery of traditional materials over the past 16 years. The step change in recovery that took place between the timeframe of 2000-01 to 2006-07 and timeframe of 2010-11 to 2015-16 is due mostly to the widespread adoption of cart-based curbside collection in North Carolina and the effects of the plastic bottle disposal ban and ABC permit recycling requirements.

Traditional Recyclable Material Recovery FY 2000-01 to FY 2015-16



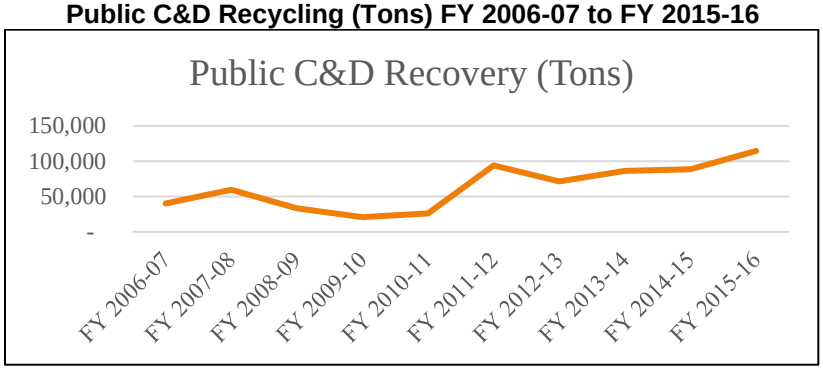
Recovery of Construction and Demolition Materials

Local government recovery of Construction and Demolition (C&D) debris includes the capture of materials generated by construction and / or demolition activities. Materials in this waste stream include shingles, vinyl siding, sheetrock, carpet, and aggregate (brick, block and other rubble). While clean lumber and wooden pallets may also be generated as a result of construction and demolition activities, when these materials are recycled by local governments they are included in the "Organics" category for this report.

[1] The decline in paper generation can be seen in statistics provided by the American Forest and Paper Association, which documents a fall in the available paper supply from 100,665,000 million tons in 2006 to 77,895,000 tons in 2015, a drop of 23 percent – see: http://www.paperrecycles.org/statistics/paper-paperboard-recovery

Some local governments have increasingly looked to the C&D waste stream for recycling success. Recycling efforts focused on this heavy waste stream can yield large tonnage results, and successfully reducing C&D disposal can be particularly important for communities experiencing population growth and the resultant construction activities. FY 2015-16 marked a high point for public C&D recycling efforts, with 114,649 tons reported as recycled. Aggregate constituted 63.5 Percent, or just over 72,800 tons, of the C&D materials recovered in FY 2015-16, the result mostly of a handful of counties focusing recovery efforts on this material. The following chart illustrates the change in the amount of C&D materials captured by public programs during the past decade.

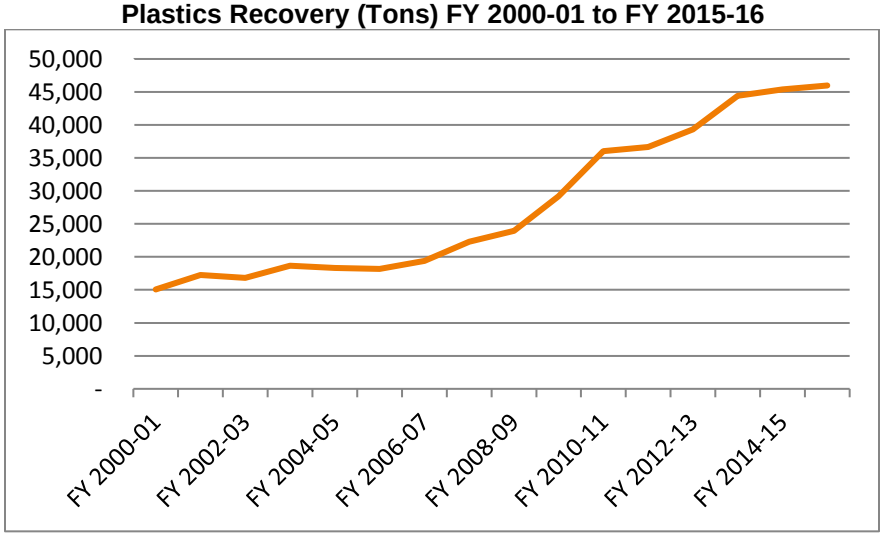
Public C&D Recycling (Tons) FY 2006-07 to FY 2015-16



Plastic Recycling in North Carolina

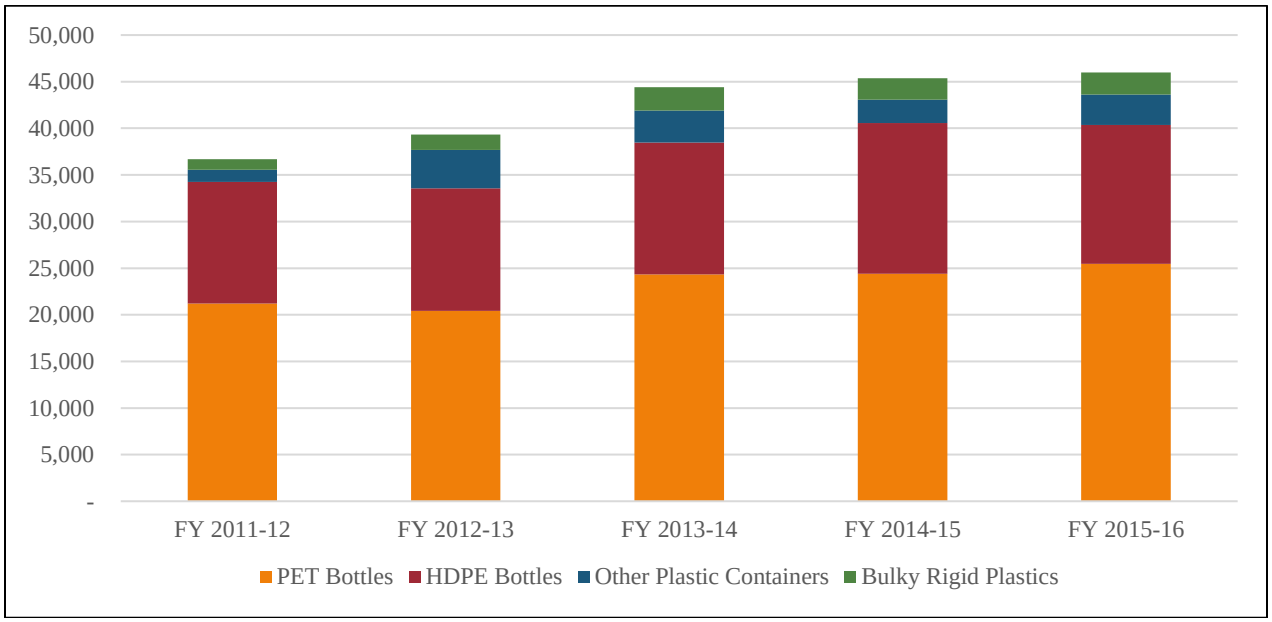
North Carolina's disposal ban on plastic bottles became effective on Oct. 1, 2009. Plastic bottle recovery has experienced significant growth since the disposal ban took effect, and the ban remains an important tool for driving plastic bottle recovery activities. The N.C. Department of Environmental Quality continues to offer local governments technical assistance enabling public recycling programs to more effectively recover plastics. This is especially important as the private sector continues to invest in North Carolina making plastics recycling and related activities an increasingly important part of our state's economy. See the section later in this chapter titled Recycling Market Developments for more information. The following chart illustrates the increased public recovery of plastic over the past 16 fiscal years.

Plastics Recovery (Tons) FY 2000-01 to FY 2015-16



Plastic bottles made of Polyethylene Terephthalate (PET) and High-Density Polyethylene (HDPE) combine to represent a little under 90 percent of the plastic materials recovered by local governments in FY 2015-16. However, containers made of Polypropylene (PP) and the collective recovery of non-bottle plastic containers such as cups, tubs and "clam-shell" style plastic containers (collectively known as "Other Plastic Containers") along with the recovery of larger Bulky Rigid Plastic durable items like buckets, totes and carts are together becoming an increasingly important aspect of plastics recycling in North Carolina. The following chart provides a more detailed examination of the recovery of the different types of plastic materials over the last five (5) fiscal years.

Plastics Recovery (Tons) by Type FY 2011-12 to FY 2015-16



Public Electronics Recycling

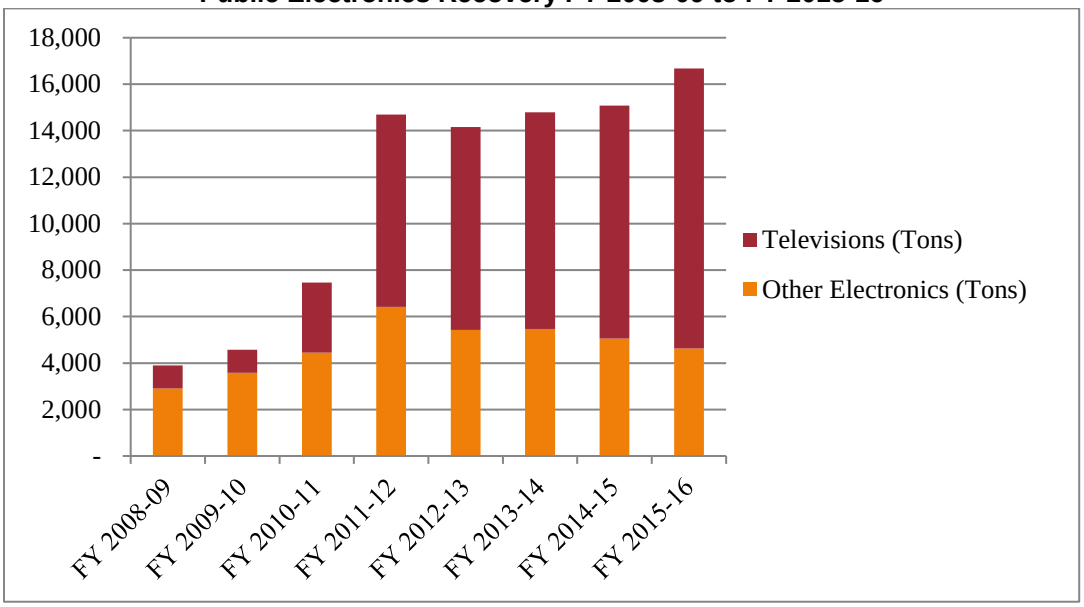
North Carolina residents have wide access to recycling programs collecting electronics and televisions. In FY 2015-16, 181 local governments indicated that they operated an electronics recycling program, many in partnership with another community. For example, 49 municipalities cooperate with their county to provide electronics recycling services, with the municipality collecting electronics from citizens within their jurisdiction and then delivering the material to the county for further management. The following table describes the range of access citizens have to recycling of electronics.

Types of Public Electronics Recycling Programs	Number of Communities Using Strategy
Collect Electronics at Drop-off Sites	119
Collect Electronics at Curbside	44
Collect Electronics at One-Day Event	33
Collect Electronics at HHW Program	15

As indicated above, the most common strategy used to collect electronics is to accept them at staffed recycling sites or convenience centers. One hundred nineteen (119) communities operate a combined 447 individual recycling sites across the state. Local governments operate electronics recycling programs in response to citizen demand for responsible “e-waste” management options and to help the public comply with the state disposal ban on computer equipment and televisions that went into effect on July 1, 2011.

Data on the amount of material collected by public electronics recycling efforts measures the collection of television and of “other electronics” including computers, printers, scanners and other devices that connect to computers, along with computer monitors, cell phones, stereos, video players and other low grade electronic devices. The combined total amount of electronics and televisions recovered by local governments during FY 2015-16 increased by 10.6 percent when compared to FY 2014-15. The following table examines public electronics recycling efforts since FY 2008-09 and shows the relative amounts of televisions and other electronics recovered each year.

Public Electronics Recovery FY 2008-09 to FY 2015-16



Data tracking television recycling separate from other electronics began to be gathered in FY 2008-09, and year-over-year since that time televisions have continued to constitute a proportionally larger amount of the total electronics collected and managed by public programs. In FY 2008-09, televisions were just 25.4 percent of the electronics collected for recycling, while in FY 2015-16 televisions were 72.3 percent of materials collected. Many factors affect the ratio of televisions to other electronics collected by a particular community, but in general the communities that began recycling televisions well before the disposal ban was implemented in July 2011 find that televisions make up proportionally less of their electronics stream than the average program. Eleven (11) early adopter counties have consistently reported recycling both televisions and other electronics since FY 2008-09 including Buncombe, Cabarrus, Chatham, Guilford, Haywood, Iredell, Onslow, Orange Transylvania, Wake and Watauga counties. The following table compares the percentage of total equipment handled that was televisions in these eleven counties versus the entire state.

Fiscal Year	Percent Televisions, Early Adopter Counties	Percent Televisions, all NC Communities	
FY 2008-09	30.4%	25.4%	
FY 2009-10	33.6%	21.7%	
FY 2010-11	39.7%	40.5%	
FY 2011-12	39.7%	56.3%	← disposal ban effective July 1st
FY 2012-13	48.7%	61.7%	
FY 2013-14	57.9%	63.0%	
FY 2014-15	61.6%	66.5%	
FY 2015-16	67.9%	72.3%	

As illustrated above, communities that began recycling televisions during or before FY 2008-09 collected more televisions relative to other electronics during the years before the disposal ban than the average North Carolina community, but since the implementation of the disposal ban these same counties have collected proportionally fewer televisions than the average community. In FY 2010-11, many communities implemented television recycling in the months leading up to the disposal ban. Since the advent of the disposal ban, those communities that began recycling televisions earlier are generally collecting proportionally less televisions relative to other electronics than the average North Carolina electronics recycling program. This is important for several reasons, primarily because recycling televisions is the most expensive aspect of operating a public electronics recycling program, and in contrast it is substantially cheaper per-pound to recycle other electronics, particularly computers. Thus early adopters of television recycling tend to find themselves handling a more financially advantageous mix of equipment than the average program. Further, it is possible that as those communities that were not early adopters of television recycling continue to operate their public recycling systems, the proportion of televisions could gradually decrease to the ratios experienced by early adopters.

Types of Public Recycling Efforts

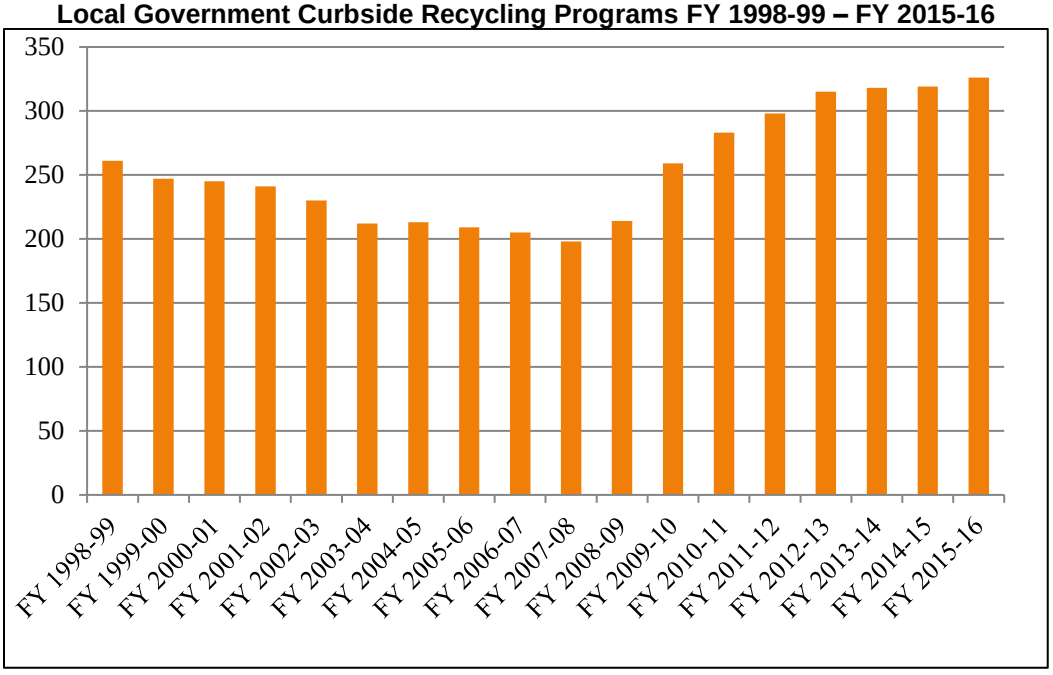
Public recycling programs employ a variety of strategies to recover a range of materials, including the operation of curbside recycling programs, drop-off recycling programs, and other recycling programs that collect traditional recyclable materials from parks, schools, businesses and multifamily properties. Public recycling programs also manage special wastes to divert potentially toxic materials from disposal. In addition, public recycling programs also offer services that target specific waste streams such as construction and demolition debris, scrap metal, yard waste, and other organic materials such as food waste and oyster shells. Finally, N.C. counties are statutorily responsible for providing services to collect and manage white goods and scrap tires, though in some cases these services may also be operated by municipalities.

In addition to providing the types services listed above, local governments can also implement policies and employ strategies that encourage or facilitate private sector recycling activities without necessitating that public recycling programs directly or contractually provide a recycling service. Examples of these strategies include local disposal bans on materials such as corrugated cardboard, mandatory recycling ordinances, or licensed hauler systems where service providers are required to offer recycling collection as a condition of doing business in a jurisdiction. These types of strategies induce or encourage the growth of private sector recovery activities and infrastructure. In FY 2015-16, 6,713 tons of recyclables were recovered through these types of strategies.

Public Curbside Recycling Programs in North Carolina

The number of publicly operated curbside recycling programs in North Carolina continued its upward trend during FY 2015-16, climbing to a new high of 326 total programs. While the rate of the growth of new curbside recycling programs has declined over the past several years, curbside recycling continues to be the most popular way for residents to access public recycling service in North Carolina. Of the seven (7) new public curbside recycling programs that began operating in FY 2015-16, four (4) of these programs were implemented with the support of state grant funds through the Community Waste Reduction and Recycling Grant Program, including programs in the following municipalities: Biltmore Forest, Mayodan, Saratoga and Spindale. The majority of remaining communities that do not offer curbside recycling are relatively small, but this group does include some larger communities such as Lenoir, Morganton, Albemarle, Eden, Roxboro and Weddington.

Local Government Curbside Recycling Programs FY 1998-99 – FY 2015-16



As of the end of FY 2015-16, it is estimated that 1.964 million North Carolina households have access to curbside recycling service. The continued growth in the number of households served by curbside recycling has been a sustained trend, with the number of households that have access to curbside recycling collection growing even during years when the state experienced a decrease in the total number of curbside recycling programs operated by local governments. Excluding yard waste, just under half of all public recycling tonnage, or 47.4 percent, was collected by curbside recycling programs in FY 2015-16.

Special Waste Management

Many counties and municipalities in North Carolina offer their residents opportunities to recycle a wide range of additional materials beyond the traditional paper, bottles, and cans commonly collected in curbside and drop-off programs. These "special wastes" include automotive-related materials such as oil and lead acid batteries but also ubiquitous household items such as dry cell batteries and fluorescent lamps.

The number of local special waste programs and the resulting tonnages diverted from disposal remained steady in FY 2015-16 compared to previous years with a few notable fluctuations. Special waste tonnages can be affected by a range of factors, including the creation or discontinuance of programs, the scheduling of market pickup services, and even changes in local record-keeping and reporting. This year, the figures for materials such as oil, antifreeze, and dry cell batteries saw increases in part because of a change in state reporting methodology in which communities were asked to split out tonnages for certain common materials from their household hazardous waste data.

The picture for the rest of special wastes was mixed. Automotive materials such as filters and lead acid batteries experienced a slight decline, as did paint and pesticide containers, the latter mostly due to a few large jurisdictions cycling off of the every third-year NCDA collection schedule in FY 2015-16. Propane tanks increased from the previous year partially due to better tracking of the material by a few communities. The collection of Lights Containing Mercury (LCMs or fluorescent lamps) was slightly higher despite the dropping of a couple local programs. A handful of local governments also continued to collect "other special waste," including leftover pharmaceuticals, oil based paints, and light ballasts.

Although the overall number of jurisdictions offering household hazardous waste collection services declined slightly, the number of permanent programs increased by one with the addition of Watauga County. Household hazardous waste tonnage was lower than the previous year, but a number of large and permanent programs experienced increases in FY 2015-16, underscoring the importance of these programs in providing consistent and reliable public access to services.

Local Government Special Waste Management, FY 2011-12 to FY 2015-16

	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16
Used Motor Oil					
Number of programs	129	127	128	129	128
Gallons collected	860,785	762,066	729,623	704,669	796,050
Oil Filters					
Number of programs	105	104	104	108	107
Tons collected	184.41	166.97	160.2	155.73	152.55
Antifreeze					
Number of programs	74	71	79	79	74
Gallons collected	35,159	22,916	25,400	24,005	39,412
Lead Acid Batteries					
Number of programs	93	91	93	91	91
Tons collected	362.69	316.23	350.94	371.09	349.51
Dry Cell Batteries					
Number of programs	37	34	38	43	45
Tons collected	45.37	33.91	27.51	73.95	90.28
Paint					

Number of exchange programs	21	13	17	15	15
Number of other collection programs	13	9	11	13	16
Total tons collected	117.94	111.74	160.21	182.14	161.4
Pesticide Containers					
Number of programs	66	64	60	59	58
Tons collected	118.32	143.45	128.03	170.6	109.52
Pesticides					
Number of programs	16	16	14	17	19
Tons collected	14.03	14.12	11.77	17.31	18.24
Lights Containing Mercury					
Number of programs	48	58	62	62	59
Tons collected	37.93	53.01	92.88	80.76	98.56
Propane Tanks					
Number of programs	37	46	41	43	41
Tons collected	47.22	61.33	63.47	63.23	136.84
Other Special Wastes					
Number of programs	8	7	9	9	11
Tons collected	1.71	.66	3.17	1.98	9.01
Used Cooking Oil					
Number of programs	55	61	74	75	77
Tons collected	142.15	133.05	213.28	197.35	197.72
Household Haz. Waste					
Number of communities offering programs	57	59	67	65	62
Number of permanent sites	20	20	20	18	19
HHW tons collected	2,905.63	3,239	3,241.07	3,443.51	3,358.89

Conversions: Oil, 1 gal = 7.4 lbs; Antifreeze, 1 gal = 8.42 lbs; Lead Acid Battery, 1 battery = 35.9 lbs; Paint, 1 gal = 11.5lbs; propane tank = 18 lbs; 1 gallon of used cooking oil = 7.5 lbs.

Yard Waste Management

The overall amount of yard waste managed by local programs in FY 2015-16 declined 5.5 percent from FY 2014-15, reflecting a year free of significant storm events and possibly some effects of a drought in parts of North Carolina. Of the 812,682 tons managed by municipalities and counties during the fiscal year, 703,554 tons of yard waste were diverted from disposal in four main ways: 1) delivery of materials like leaves to gardeners and farmers (end-users), 2) processing by local government mulching and composting operations, 3) mulching and composting of locally collected materials at private facilities, and 4) sale of yard waste materials to boiler fuel and other energy markets.

A portion of locally managed yard waste is disposed in land clearing and inert debris (LCID) landfills, which is allowed under the disposal ban. However, as in past years, not all of this material may actually be disposed. Some of it may be converted by LCID operators to mulch, compost, or biomass fuels, thus probably undercounting actual total diversion.

Local Government Yard Waste Management FY 2014-15 and FY 2015-16

Destination of Materials	FY 2014-15 Tons Managed	FY 2015-16 Tons Managed
End Users (direct delivery)	26,981	24,516
Local Mulch/Compost Facility	432,370	448,753
Local Government Yard Waste Diverted by Private Mulch and Compost Facilities.	109,876	100,798
Wood/Yard Waste Fuel Markets	144,607	129,487

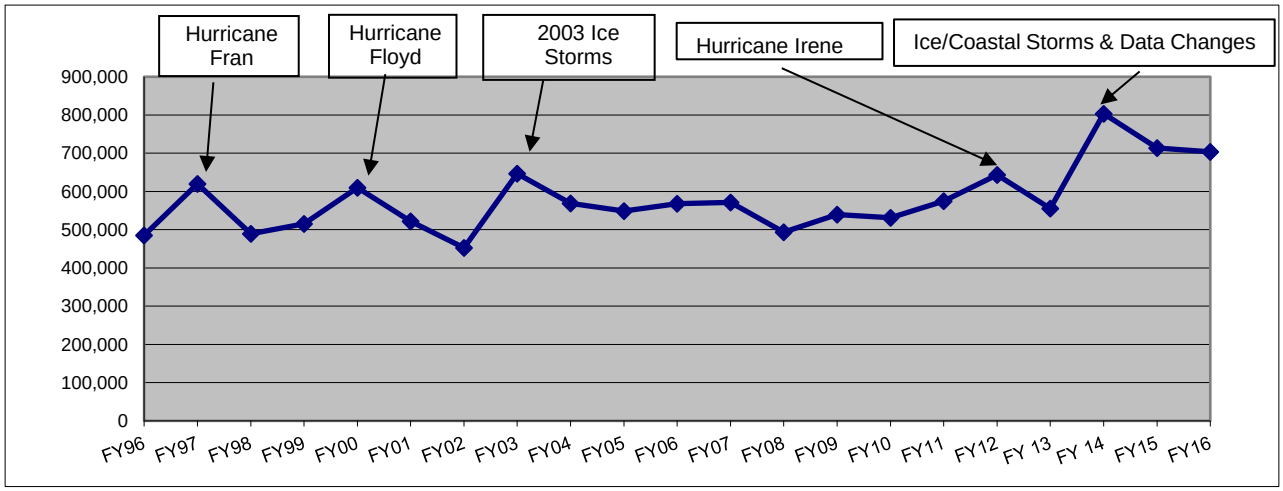
TOTAL DISPOSAL DIVERSION*	713,834	703,554
Other Public Facility**	*156,668*	*175,202*
Local Government Yard Waste Taken to Private Facilities Where Material End-use is Unknown or is Disposed.	2,184	2,388
LCID Landfill	140,276	106,740
YARD WASTE TOTALS	**856,294**	**812,682**

* Tonnages in the table below the row for "Total Disposal Diversion" are not included in diversion because of data redundancy, uncertainty about actual disposition of the waste, and actual disposal of noted tonnages.

** Yard Waste Totals exclude tons for "other public facilities" - these tons were captured under "Local Mulch/Compost Facility."

The amount of yard waste diverted from disposal since the implementation of state's yard waste disposal ban in January 1993 is now at a cumulative 12.2 million tons of material, equivalent to 19.6 million cubic yards of landfill space.

Local Government Diversion of Yard Waste From Disposal, FY 1995-96 to FY 2015-16

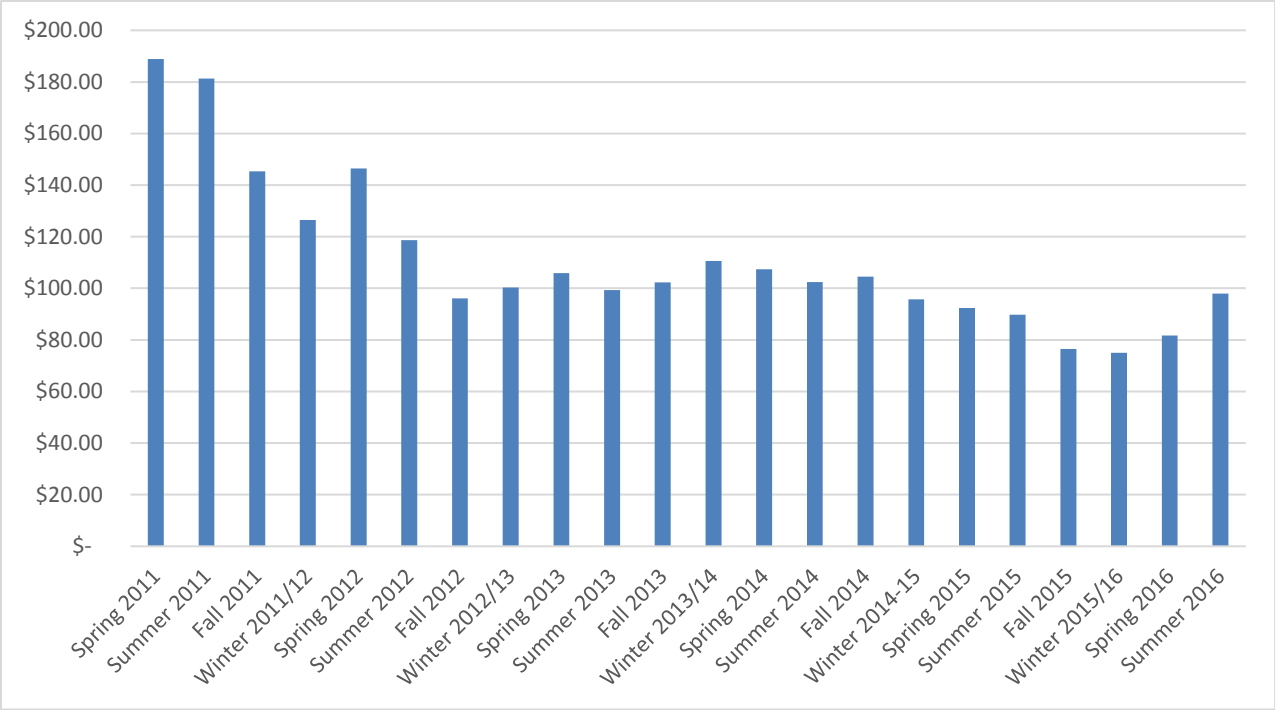


Recycling Markets and Prices

Recycling commodity prices were generally flat through FY 2015-16, lingering at relatively low levels in a trend that started two years previously. Many of the same factors that started the downward market trend continued to influence pricing, including relative weakness in Chinese material demand, a slow growing world economy, low petroleum and natural gas prices affecting recycled plastics, and a strong dollar affecting the import and export picture. A small upward tick in traditional material prices toward the end of the fiscal year helped improve the situation for Material Recovery Facilities (MRFs) and other key recycling sectors.

A key bellwether of material prices is the "blended value," or weighted average price of a ton of single stream material at MRFs. Over the course of FY 2015-16, the blended value at times fell below MRF operating costs, which led many MRFs to charge processing fees and re-set previous revenue sharing arrangements. Contamination issues remained on the forefront for MRFs struggling to make margin, as did the challenge of handling glass. The graph below shows the history of MRF blended values since 2011.

MRF Blended Material Values, Spring 2011 to Summer 2016



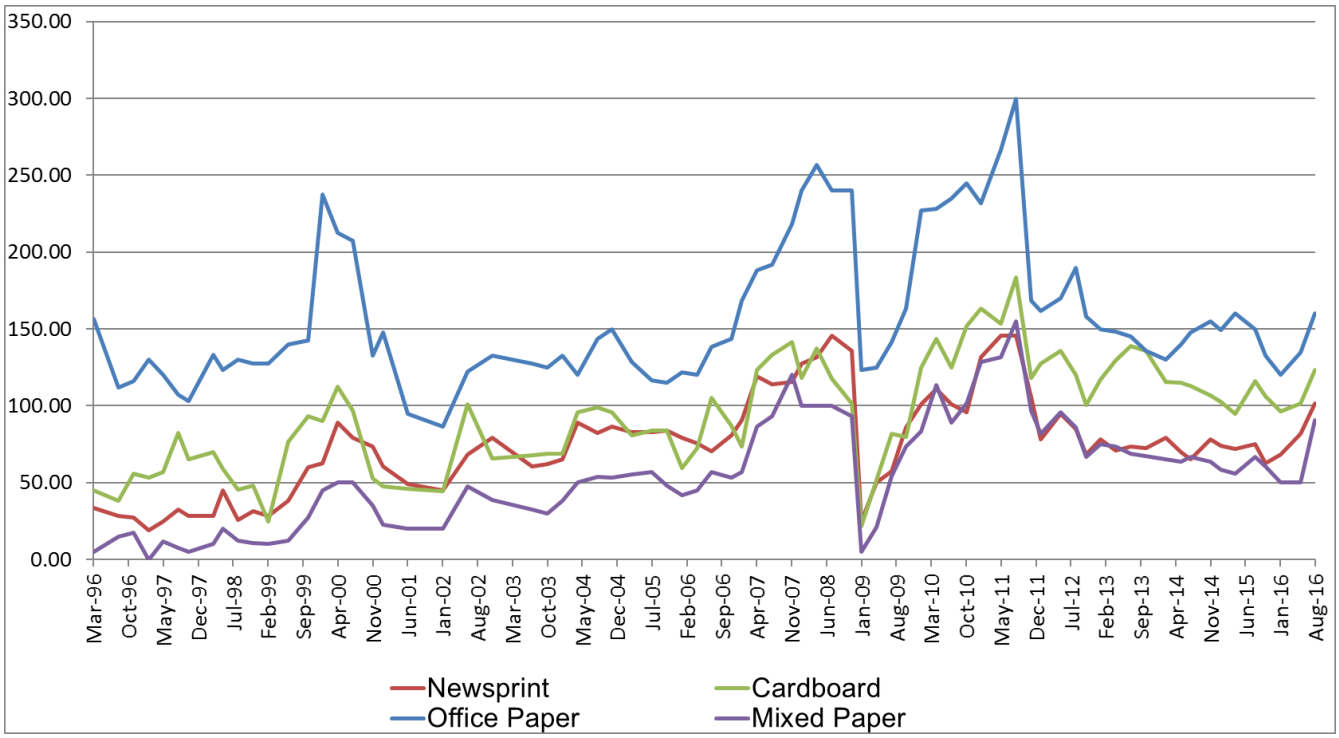
The table below provides more detail on specific commodity prices through FY 2015-16. It shows a slight dip and then rebound for fiber materials through the year and improvement as well in aluminum, steel cans, PET and HDPE, all coming out of a deep trough in pricing earlier in the year. But the table also demonstrates how the value of glass counterbalances some of these gains, reflecting the imposition of stricter quality standards by glass processors and associated material price downgrades.

Recycling Market Prices Received by Major N.C. Processors, FY 2015-16

Material	Summer 2015	Fall 2015	Winter 2015-16	Spring 2016	Summer 2016
Aluminum Cans, lbs.	$.52	$.53	$.55	$.60	$.60
Steel Cans, gross tons	$63	$45	$43	$110	$83
PET, lbs.	$.13	$.06	$.07	$.10	$.11
HDPE Natural, lbs.	$.34	$.25	$.25	$.33	$.31
Newsprint, ton	$75	$63	$68	$82	$102
Corrugated, ton	$116	$106	$95	$102	$123
Office paper, ton	$150	$132	$120	$135	$160
Mixed paper, ton	$67	$61	$50	$50	$91
Mixed glass, ton	-$7	-$10	-$7	-$20	-$13

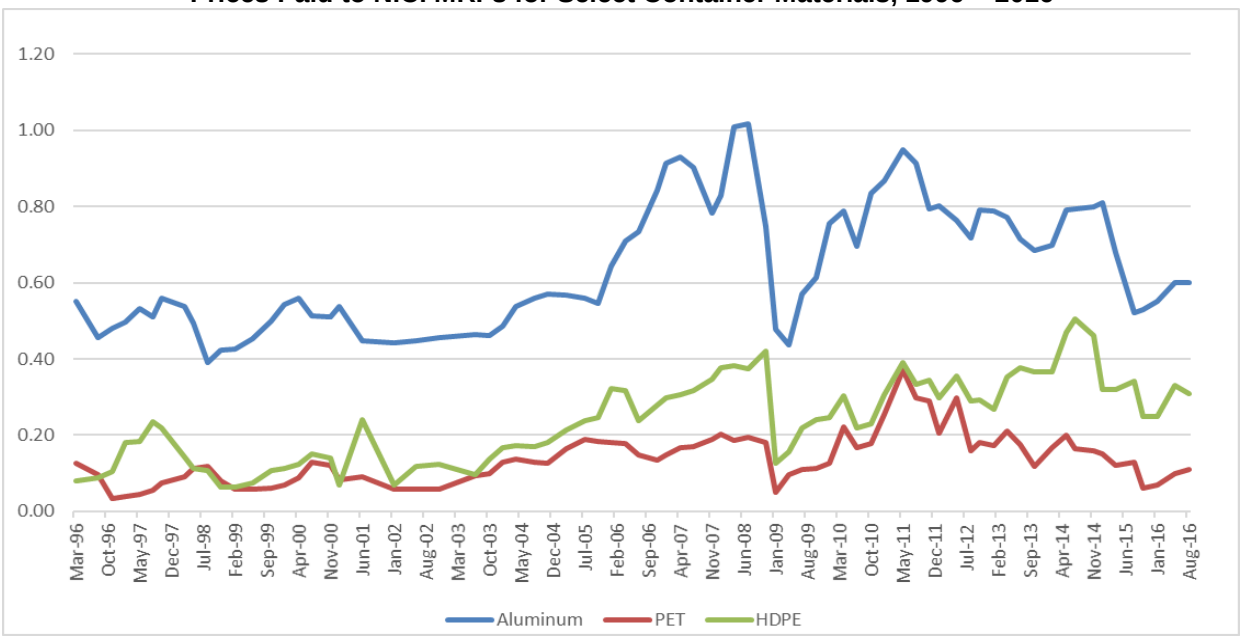
The graph below shows the history of paper pricing over the last 20 years, demonstrating the inherent fluctuating aspects of commodity markets. Nevertheless, for mixed paper and cardboard, there is a clear difference between the periods of 1996-2006 and 2006–2016 with each grade consistently exceeding price thresholds of the previous 10 years.

Market Prices Received for Fiber Materials by Major N.C. Processors, 1996 - 2016



A similar graph is displayed below showing 20 year pricing for three key container materials: aluminum, PET and HDPE. It shows similar volatility for these commodities with aluminum and HDPE tracking generally higher over the last decade. PET pricing has suffered the most in the last three years, approaching values not seen the late 1990s. A glut of PET manufacturing worldwide and ongoing low fossil fuel prices are helping to drive down PET values.

Prices Paid to N.C. MRFs for Select Container Materials, 1996 – 2016



Recycling Market Developments in FY 2015-16

FY 2015-16 brought some notable expansions and changes to North Carolina's private recycling infrastructure. A key addition to the state's recycling economy was the opening of Unifi's $29 million plastic bottle processing facility in Reidsville which will allow the company to source PET directly from MRFs to feed into its Repreve brand polyester yarn manufactured in Yadkinville. The capacity

added by Unifi underscores the need to increase PET recovery in North Carolina, which also is home to Clear Path PET recycling facility in Fayetteville.

At the end of calendar year 2015, the purchase of Reflective Recycling by Strategic Materials (SMI) brought major changes to glass processing in North Carolina. SMI retired its beneficiation facility in Raleigh and combined those operations into the former Reflective plant in Wilson. SMI then made additional investments in Wilson to make new products and improve its ability to supply clean glass cullet to North Carolina's glass manufacturers. In a somewhat related development, the Ardagh glass bottle manufacturing plant initiated a $30 million furnace rebuild in Wilson at the end of 2016, reaffirming a sustained presence of the glass industry in North Carolina and reinforcing a strong demand for recycled cullet.

Organics remained a strong area of development and investment in the state recycling economy in FY 2015-16, including on-going construction of the Entropy IM (formerly BlueSphere) anaerobic digestion facility in Charlotte, which is expected to start receiving a variety of organic feedstocks in early 2017 to power gas-fired electricity generation. Also in the Charlotte area and in a sign that organics recycling is starting to attract more capital, Earth Farms, a pioneer in food waste collection and composting in North Carolina, was acquired by Wind River Environmental. McGill Environmental, one of the state's longest-standing organics companies with two facilities in North Carolina, celebrated its 25th anniversary as a composter of a wide range of agricultural, industrial, and commercial materials. And in a study of organics diversion in North Carolina, the Division of Environmental Assistance and Customer Service documented that close to 100,000 tons of food waste was diverted from disposal in 2015 through food rescue, composting, and digestion. The study also found that North Carolina has ample composting capacity to substantially increase organics diversion.

Private facility recovery of construction and demolition (C&D) materials continued to contribute to waste diversion efforts in North Carolina. C&D recycling at private facilities increased 14 percent from the previous year, from 201,450 tons in FY 2014-15 to 230,068 tons in FY 2015-16. The North Carolina Department of Transportation also noted a significant increase in the use of shingles used in road building. At 205,736 tons for FY 2015-16, shingle use was up 20 percent from the previous year (see NC DOT chapter of this report).

As a key market development tool, North Carolina's Recycling Business Development Grant (RBDG) program helped spur additional private recycling infrastructure expansions in the state in FY 2015-16. The grants help companies finance critical capital projects and are matched by at least 50 percent by the recipients. Examples of funded projects included MRF upgrades and expansions in Asheville, Mooresville, Raleigh, Wilkesboro, and Wilmington. Organics collection and composting received a boost with grant projects in Charlotte, Davie County, Durham, and Raleigh, and investments were also made by wood waste processors in Charlotte and Rocky Mount. Reflecting continued state interest in expanding construction waste recycling, additional grants were made to companies in Gaston, Guilford, and Robeson counties. General private recycling collection operations were expanded and improved by grants in Beaufort and Davidson counties, and plastics recyclers in Columbus, Gaston, and Randolph counties also received funding. In sum, RBDG awards continued to play a key, strategic role in supporting a diverse and dynamic private recycling marketplace across North Carolina.

Chapter 3
Department of Environmental Quality - Scrap Tire Management

Scrap tires were banned from disposal in landfills by G.S. 130A-309.10 in 1990. The Solid Waste Section administers the Scrap Tire Management Program and manages the Scrap Tire Disposal Account. This account was created by the 1993 General Assembly. Its purpose is to provide each county with funds for the disposal of scrap tires at no direct cost to citizens and businesses. To fund this statute, the General Assembly imposed a one percent tax on the sale of new large tires and a two percent tax on the sale of new small tires. The money is used to provide additional funding to counties for the cleanup of illegal tire dumps and for county-incurred deficits in their scrap tire management programs. Scrap tire legislation requires the division to consider county efforts to avoid free disposal of out-of-state tires and other ineligible tires and county program efficiency in using their allocated funds when making decisions about grant awards.

County Tire Disposal

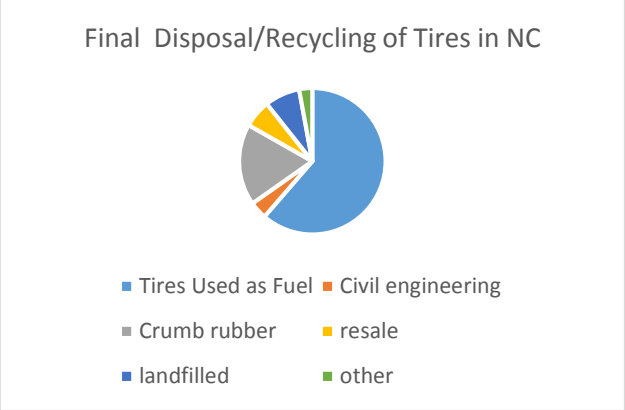
Ninety-eight (98) county programs, including one regional program (the Coastal Regional Solid Waste Management Authority, which serves Carteret, Craven and Pamlico Counties), reported that they generated 141,331 tons of scrap tires in North Carolina, of which 1,477 tons were sent to other states.

Counties reported spending a total of $12,417,367.37 for scrap tire management and disposal. Of the total spent, $11,528,289.44 was for direct disposal costs and $889,077.93 was for other costs, such as labor or equipment costs. North Carolina processors report that county contracts typically charge $50-75 per ton, including transportation and trailer rental costs. Counties at a distance from processing facilities may pay as much as $75-$100 per ton.

Tire Recycling

North Carolina tire processors reported they received 229,220 tons of scrap tires from N. C. counties and 47,857 tons of tires from other states. It is important to note that many tire sellers bypass county tire collection sites and have tires taken directly to processors. In FY 2015-16, 198,586 out of 229,220 tons or roughly 87 percent of scrap tires managed by North Carolina counties from North Carolina were processed, recycled or reused. Reuse or disposal is as follows:

Final disposal/recycling of tires in N. C. (tons)	
Tires disposed (landfill)	15,408
Tires used as fuel	121,823
Tires used as crumb rubber	35,726
Tires re-used or re-capped	12,147
Tires used in civil engineering	7,718
Tires used for other purposes	5,764



Scrap Tire Disposal Account

Distributions of Scrap Tire Tax Revenue	
Net Tax Collections by the Dept. of Revenue	$19,073,739.51
Dept. of Revenue Cost of Collecting	$302,760.28
Amount distributed to counties (70%)	$13,139,685.46
Amount distributed to the General Fund	$5,631,293.77

Account Balance		
Balance of Funds as of July 1, 2015		**$2,402,767.22**
Cost Overrun Grants to Counties	($892,281.95)	-
Clean Up Grants to Counties	($80,651.12)	-
Total Debits		**($972,933.07)**
Transfer from General Fund	$420,000.00-	
Total Credits	-	**$420,000.00**
Ending Balance June 30, 2016	-	**$1,849,834.15**

Cost Overrun

The first cost-overrun grant cycle (Table 1) for FY 2015-16 included grants to 31 counties. The second grant cycle (Table 2) included grants to 44 counties. The two grant cycles in 2015-16 totaled $892,281.95.

Table 1: County Tire Cost Over-Run Grants Awarded July 2015

County	Requested Amount	Tax Distributions Reported	Awarded Amount
Alleghany	$4,103.54	$6,986.35	$4,103.54
Ashe	$19,376.67	$17,341.99	$18,407.84
Bladen	$6,150.24	$22,256.84	$5,842.73
Brunswick	$5,441.45	$73,148.12	$5,441.45
Camden	$2,474.24	$6,431.34	$2,474.24
Cherokee	$1,820.12	$17,365.38	$1,820.12
Chowan	$13,540.13	$9,365.08	$13,540.13
Cleveland	$5,949.36	$61,588.28	$5,949.36
CRSWMA	$1,570.24	$112,835.19	$1,570.24
Currituck	$255.57	$15,491.10	$255.57
Edgecombe	$51,495.93	$35,212.45	$48,921.13
Graham	$5,010.56	$5,596.92	$5,010.56
Granville	$807.09	$36,606.94	$807.09
Halifax	$3,495.08	$33,948.80	$3,495.08
Haywood	$100,589.44	$73,005.21	$100,589.44
Hertford	$3,497.78	$15,563.80	$3,497.78

Lincoln	$16,063.67	$50,409.61	$14,457.30
Macon	$9,305.90	$21,588.05	$8,840.60
Mecklenburg	$34,329.04	$626,993.66	$30,896.14
Mitchell	$11,879.20	$9,739.30	$11,285.24
New Hanover	$11,673.61	$135,156.14	$11,673.61
Pender	$2,509.75	$35,126.48	$2,509.75
Rutherford	$8,298.16	$42,863.17	$7,883.25
Scotland	$6,755.04	$22,897.82	$6,417.29
Surry	$7,862.95	$46,363.31	$7,862.95
Tyrrell	$214.08	$2,618.92	$214.08
Vance	$13,905.58	$28,481.47	$13,210.30
Warren	$7,844.77	$12,929.07	$7,844.77
Washington	$8,620.37	$8,107.76	$8,620.37
Wilkes	$13,938.46	$44,093.94	$12,544.61
Wilson	$9,082.80	$51,453.90	$9,082.80
Total			$375,069.36

Table 2: County Tire Cost Over-Run Grants Awarded January 2016			
County	Requested Amount	Tax Distributions Reported	Awarded Amount
Alleghany	$4,022.98	$6,980.20	$4,022.98
Ashe	$20,877.25	$17,326.71	$15,657.94
Beaufort	$21,071.28	$30,174.90	$20,017.72
Bladen	$14,062.87	$22,237.24	$10,547.15
Brunswick	$17,547.27	$73,083.69	$14,915.18
Camden	$2,581.01	$6,425.68	$2,581.01
Catawba	$16,852.94	$98,154.17	$14,325.00
Cherokee	$7,738.42	$17,350.08	$7,351.50
Clay	$82.76	$6,817.26	$82.76
Cleveland	$11,294.57	$61,534.02	$8,470.93
Currituck	$1,889.02	$15,477.46	$1,889.02
Edgecombe	$47,252.29	$35,181.45	$40,164.45
Forsyth	$33,664.93	$227,665.57	$25,248.70
Graham	$8,505.95	$5,591.99	$7,230.06
Haywood	$32,692.01	$37,688.79	$27,788.21

Hertford	$8,900.55	$15,550.09	$8,455.52
Iredell	$10,304.53	$104,193.95	$7,728.40
Macon	$13,395.76	$21,569.01	$10,046.82
Mecklenburg	$164,638.09	$626,441.46	$115,246.66
Mitchell	$10,465.66	$9,730.74	$7,849.24
Montgomery	$9,451.58	$17,537.66	$6,616.11
New Hanover	$10,448.72	$135,037.08	$9,926.28
Northampton	$58.16	$13,417.24	$58.16
Orange	$648.63	$88,227.66	$648.63
Pasquotank	$33,253.33	$50,832.47	$31,590.66
Pender	$6,122.29	$35,095.53	$5,203.95
Pitt	$12,404.10	$109,818.17	$11,783.90
Rutherford	$26,391.82	$42,825.41	$19,793.86
Scotland	$9,588.94	$22,877.66	$7,191.70
Stanly	$5,633.93	$38,281.21	$3,943.75
Surry	$5,700.14	$46,322.42	$5,415.13
Vance	$24,893.38	$28,456.38	$18,670.04
Warren	$8,734.01	$12,917.66	$8,297.31
Washington	$12,417.04	$8,100.62	$11,796.19
Wilkes	$18,725.88	$44,055.10	$13,108.12
Wilson	$14,262.68	$51,408.56	$13,549.55
Total			$517,212.59

Tire Cleanups

In FY 2015-16, 28 nuisance tire sites were cleaned in 16 counties, using $80,651.12 in funds.

County Clean Up Grants			
County	**Amount**	Date Requested	Date Paid
Winston-Salem	**$66.37**	7/14/2015	7/22/2015
Robeson County	**$1,914.75**	7/21/2015	7/29/2015
Union County	**$278.80**	7/21/2015	7/30/2015
Rockingham County	**$2,351.33**	7/28/2015	8/6/2015
Guilford County	**$9,471.32**	8/4/2015	8/31/2015
New Hanover County	**$225.75**	8/15/2015	9/21/2015
Alamance County	**$1,472.10**	10/13/2015	10/21/2015
Union County	**$182.04**	10/20/2015	10/29/2015
New Hanover County	**$177.00**	10/28/2015	11/13/2015
Winston-Salem	**$310.89**	11/17/2015	11/25/2015
Iredell County	**$624.80**	11/24/2015	12/16/2015
Warren County	**$41,562.57**	11/24/2015	12/2/2015
Iredell County	**$85.60**	12/8/2015	12/16/2015
Warren County	**$4,231.42**	12/15/2015	12/28/2015
Chatham County	**$1,190.93**	12/21/2015	12/31/2015
Rowan County	**$1,093.00**	1/5/2016	1/15/2016

Henderson County	**$1,798.68**	1/20/2016	1/31/2016
Union County	**$76.26**	1/20/2016	2/1/2016
Rutherford County	**$1,043.43**	1/20/2016	1/31/2016
New Hanover County	**$729.00**	2/2/2016	2/17/2016
Catawba County	**$280.80**	3/22/2016	3/31/2016
Union County	**$294.38**	4/19/2016	5/2/2016
New Hanover County	**$44.25**	4/26/2016	5/11/2016
Buncombe County	**$851.08**	5/10/2016	5/18/2016
Warren County	**$3,676.32**	5/24/2016	6/2/2016
Chatham County	**$983.90**	5/31/2016	5/31/2016
CRSWMA (Coastal Regional Solid Waste)	**$2,540.65**	6/7/2016	6/15/2016
Buncombe County	**$3,093.70**	6/14/2016	6/22/2016
Total	**$80,651.12**		

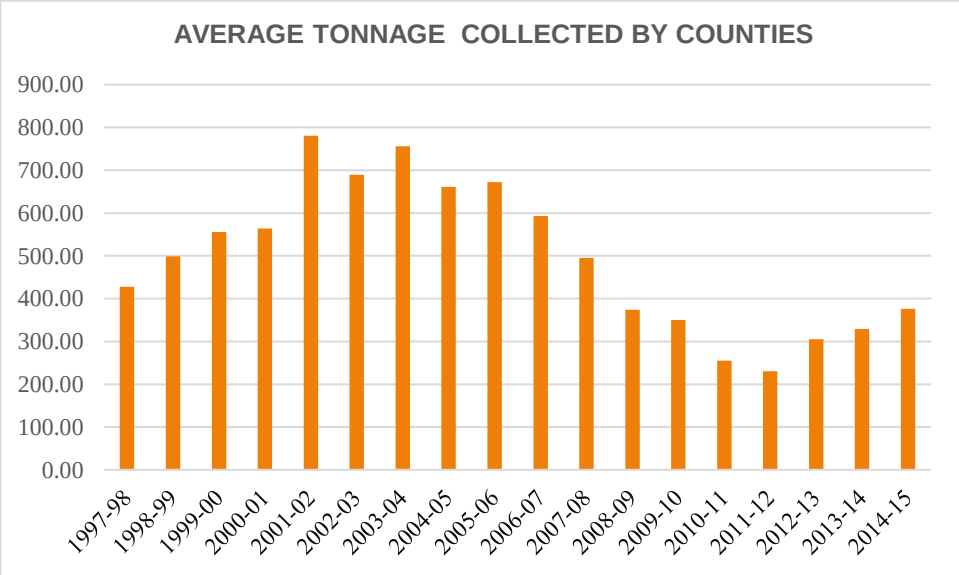
Chapter 4
Department of Environmental Quality - White Goods Management

"White goods" are defined in G.S. 130A-290 as, "refrigerators, ranges, water heaters, freezers, unit air conditioners, washing machines, dishwashers, clothes dryers and other similar domestic and commercial large appliances." In 1993, the North Carolina General Assembly passed a white goods management law because white goods were difficult to dispose of and contained greenhouse gasses, particularly chlorofluorocarbon refrigerants [CFCs]. To fund this statute, the General Assembly imposed a $3 tax on new white goods purchases.

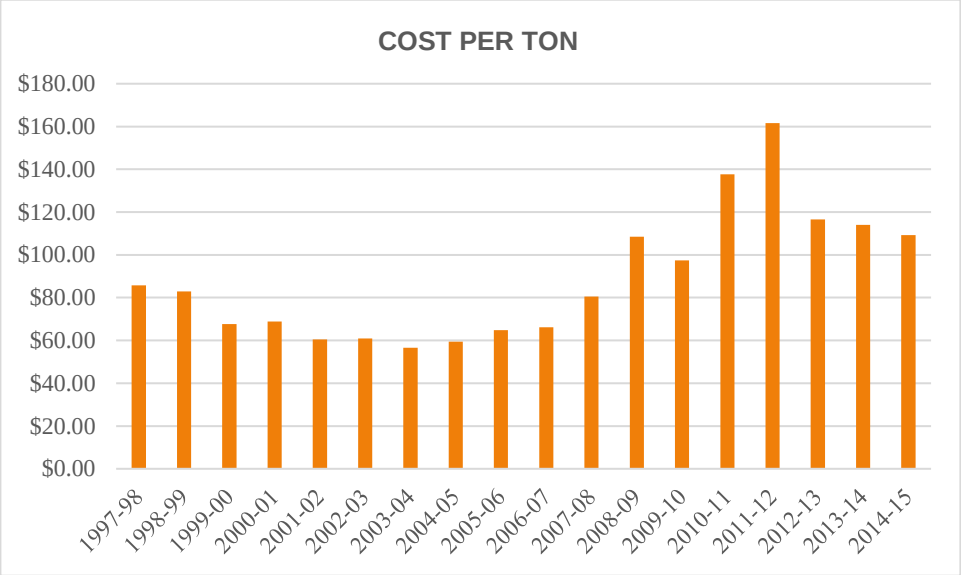
Counties were mandated to manage white goods by providing at least one disposal site, at no cost to citizens, and to arrange for the removal of CFCs. The majority of the white goods tax revenue, is distributed to county governments for use in running their programs.

Counties that forfeited their White Goods Distributions:				
County governments with unspent funding exceeding 25 percent of what they received over the past year became ineligible to receive funding, creating forfeited funds which went into the General Fund. The counties that forfeited funds were taken from the 2014-15 Annual Fiscal Information Report (AFIR), which counties submit to the Local Government Commission on or before Nov. 1 of each year.	Anson	Avery	Bertie	Burke
	Cherokee	Dare	Davidson	Forsyth
	Greene	Halifax	Henderson	Hoke
	Hyde	Hyde	Jones	Macon
	Martin	Mecklenburg	Montgomery	Northampton
	Rockingham	Sampson	Tyrrell	Wilson
				Yancey

White Goods Program Data



Average tonnage collected by counties has increased as the value of scrap metal falls.



As daily operational costs have remained fairly steady and tonnages of scrap metal collected by counties has increased, the cost to manage a ton of white goods and scrap metal has begun to decease. The data for these graphs was derived from the 2014-15 Annual Financial Information Reports because the current report is not available as of publication.

White Goods Disposal Account

County governments can apply for grants for white good program cost overruns, white goods clean ups, and capital improvement grants. There was no need for cleanup grants this fiscal year because the high value of the metals resulted in small local businesses removing all abandoned appliances.

White Goods Tax Collection/Distributions	
Tax Collections by the Department of Revenue	$4,850,129.17
Department of Revenue Cost of Collecting	$300,881.37
To General Fund (includes $1,273,789.38 plus forfeited from ineligible counties $781,899.89)	$2,055,689.27
Distributions to Counties (72% of Revenue)	$2,493,558.53

White Goods Disposal Account		
Balance of Funds as of July 1, 2015		**$1,706,267.50**
Debits		
Cost Overrun Grants to County Programs	308,173.75$]	
Site Cleanup Grants	$0	
Capital Improvement Grants	493,373.13$]	
Total Debits		**[$801,546.88]**
Credits		
Distributions to White Goods Disposal Acct	$0	
Forfeited tax revenue to General Fund	$0	
Total Credits		**$0**
Ending Balance June 30, 2016		**$904,720.62**

White Goods Cost Overrun Grants FY 2015-16

County	Requested Amount	Awarded Amount
Alexander	$12,229.60	$12,229.60
Beaufort	$14,367.38	$14,367.38
Bladen	$9,532.63	$9,532.63
Brunswick	$21,072.88	$21,072.88
Carteret	$10,883.38	$10,883.38
Chatham	$33,213.04	$33,213.04
Cleveland	$21,531.58	$21,531.58
Lenoir	$22,796.29	$22,796.29
Mitchell	$19,262.95	$19,262.95
Orange	$33,662.73	$33,662.73
Rutherford	$31,703.74	$31,703.74
Scotland	$5,898.98	$5,898.98
Stanly	$49,235.00	$49,235.00
Stokes	$15,002.42	$15,002.42
Warren	$1,174.55	$1,174.55
Washington	$6,606.60	$6,606.60
TOTAL	**$308,173.75**	**$308,173.75**

Capital Improvement Grants FY 2015-16

County	Purpose	Amount
Albemarle, City of	Security gate	$19,768.02
Wilkes	Forklift	$12,400.00
Onslow	Roll-off truck	$149,000.00
Gaston	Track loader	$65,376.28
Mitchell	Truck	$15,748.97
Harnett	Truck	$133,789.94
Wilkes	Pad	$2,975.65
Swain	Roll-off truck	$62,800.00
Washington	Tractor	$31,514.27
	TOTAL	**$493,373.13**

Recent Changes and Future Direction

Legislative changes to the white goods program were made according to Session Law 2013-360. The Department of Revenue sent the portion of the white goods tax distributed after August 1, 2013, which previously went to the White Goods Management Account and all forfeited funds, to the General Fund. All distributions to county governments continue to be made quarterly. The white goods program will continue to function as it has in the past, awarding grants as needed for cost overruns, capital improvements, and cleanups until funding is exhausted or until June 30, 2017.

Chapter 5
Department of Environmental Quality - Abandoned Manufactured Homes (AMH) Program

As established in G.S. 130A-309.111, the Division of Environmental Assistance and Customer Service (DEACS) operates a grant program that provides funding to North Carolina counties to facilitate the identification, deconstruction, recycling and disposal of abandoned manufactured homes which are deemed unfit, unsafe and hazardous. The Abandoned Manufactured Homes Grant Program Request for Proposals (RFP) was originally developed and made available to North Carolina counties in October 2009, and FY 2015-16 was the seventh year of grant program operation.

AMH Grants Awarded by Fiscal Year

The table below illustrates the number of grants awarded during each of these seven years of the program's operation and the funding allocated to those grants.

Fiscal Year	Number of AMH Grants Awarded	Grant Funds Allocated
FY 2009-10	**10**	**$385,000**
FY 2010-11	**3**	**$ 105,000**
FY 2011-12	**4**	**$150,000**
FY 2012-13	**3**	**$117,500**
FY 2013-14	**4**	**$80,000**
FY 2014-15	**3**	**$74,500**
FY 2015-16	**6**	**$69,000**

Six new abandoned manufactured home (AMH) grant contracts were initiated during FY 2015-16, and these six grants represent a total expenditure of $ 69,000 from appropriated funds allocated to the Solid Waste Management Outreach Program. For the past three fiscal years the AMH Grant Program has allowed for grant contracts with initial terms of up to two years, whereas previously contracts were limited to one year terms. Except for Ashe County and Henderson County, all other grant recipients during FY 2015-16 received 2-year grants. These counties included Burke, Chowan, Vance and Warren Counties. Ashe County received a six-month grant to conduct planning activities which they completed in January 2016.

AMH Program Statistics

As required by G.S. 130A-309.117, each AMH grant program participant must submit an annual report to the state every August that documents and summarizes county program information from the previous fiscal year. Based on the August 2016 grantee reports, the following table shows the total number of AMH units deconstructed under the program and the resulting amount of waste disposed and recycled in FY 2015-16 including mercury thermostats, which are required to be removed prior to disposal.

Statistics for AMH Program for Fiscal Year 2015-16	
Units Deconstructed	56 Units
Materials Landfilled	674.82 Tons
Materials Recycled (percentage of total tonnage)	88.75 Tons (11.6 %)
Mercury Thermostats Recovered	6 Thermostats

There were 13 AMH program grants active during FY 2015-16. The number of units deconstructed during FY 2015-16 decreased slightly when compared to Fiscal Year 2014-15, from 63 units to 56 units. As a result, the tons of materials landfilled and recycled were lower than that of the previous year, although the overall percentage of materials recycled still remained consistent with FY 2014-15, at just under 12 percent of total materials handled. The following table presents the individual AMH grants that were active during FY 2015-16 and provides details from those programs.

AMH Grant Program Participants during FY 2015-16						
County	Contract Start Date	Contract End Date	Grant Award	County Costs during FY	Responsible Party Fees Collected	# Units Deconstructed during FY
Alamance	5/23/2014	5/22/2016	$24,000	$14,825.00	$ 600.00	13
Ashe [-1]	8/1/2015	1/30/2016	$2,500	$ 638.53	$0.00	0
Burke[-1]	5/15/2016	5/14/2018	$ 12,000	$ 0.00	$ 0.00	0
Chowan[-1]	5/15/2016	5/14/2018	$ 14,500	$ 798.00	$ 0.00	0
Harnett	7/1/2014	6/30/2016	$ 24,000	$ 15,653.00	$ 3,966.00	5
Henderson[-1]	10/1/2015	9/30/2016	$ 16,000	$ 16,081.50	$ 2,590.60	7
Iredell	6/20/2014	12/31/2016	$16,000	$ 10,557.00	$ 2,867.00	7
Onslow	3/1/2012	2/28/2016	$37,500	$ 6,850.00	$ 840.00	2
Robeson	11/21/2014	11/22/2017	$24,000	$ 9,450.00	$0.00	0
Rockingham	4/30/2015	4/29/2017	$26,500	$ 7,376.44	$ 0.00	4
Stanly	11/1/2014	4/30/2017	$24,000	$ 9,896.98	$1,050.00	6
Vance[-1]	5/15/2016	5/14/2018	$ 12,000	$ 0.00	$ 0.00	0
Warren[-1]	5/15/2016	5/14/2018	$ 12,000	$ 9,186.81	$ 1,425.00	3
[1] Grants initiated during FY 2015-16						

Program Participant Highlights, FY 2015-16

Alamance, Ashe, Harnett and Onslow counties completed work on existing AMH Grants during FY 2015-16. Ashe County's six-month planning grant was used to assess the inventory of AMH units within the county and to plan for program implementation. The county board committed itself to pursuing an AMH grant to deconstruct homes in a later year pending available funding from the state. Grant contract extensions were made during this period for Iredell, Robeson and Stanly counties so that they could continue work on their existing grants. Iredell and Robeson received one-year contract extensions, and Stanly County was granted a six-month extension to April 2017. Previous AMH grantees are eligible to reapply, and during FY 2015-16 new "repeat" grants were initiated for Burke, Henderson, Vance and Warren counties. Also, during FY 2015-16 Chowan County launched a new AMH program and was issued a first-time AMH grant that included a one-time planning grant. The total expenditure by counties associated with AMH grant program related activity in FY 2015-16 was $101,313.26, and the total amount of funds contributed by responsible parties was $13,338.60.

Additional Information on the AMH Program

The authorizing legislation for the state AMH grant program expires on October 1, 2023. In light of the potential sunset of the state program, one goal is to help counties develop local abandoned manufactured home clean-up programs that are able to operate independent of state financial support. DEACS has begun gathering information on strategies that can be adopted by counties to minimize dependence on state funds. State staff provides technical assistance to counties who are interested in pursuing policies and identifying potential sources of funds that together can lead to local clean-up programs that do not relay on state funds in order to perform clean-up operations.

As part of the annual progress report, counties are now asked to identify local deconstruction activities that took place without reliance on state funds. In FY 2015-16 only Robeson County reported the abatement of units completed without state grant program assistance. Robeson County reports that 17 abandoned manufactured homes were demolished independent of state support at the cost of $ 7,725. This work was enabled by a US Housing and Urban Development Grant to the Lumbee Tribe. In addition to the federal funds, homeowner fees collected by the Lumbee Tribe amounting to $3,520.96 were used to help pay for these demolition and abatement activities. As a result of this activity, the county reported that 11 mercury thermostats were recovered, 92.83 tons of material was landfilled, and 19.01 tons of material was recycled. No state grant money or county money was used to assist in the demolition or disposal of any of these units managed by the Lumbee Tribe.

Another example of how a community can generate funds for the management of abandoned manufactured homes is found in Onslow County, where the county assesses a $50 fee for each new manufactured home sited in the county. The funds collected from this fee are used by the county to assist with the operation of their Manufactured Home Demolition Assistance Program. This is an approach that could be adopted by other counties as a means to help fund local abandoned manufactured home clean-up programs.

Chapter 6
Department of Environmental Quality - Electronics Management Program

North Carolina General Statute 130A-309.130 established the Electronics Management Program. The program directs manufacturers of electronics, retailers, consumers, and state and local governments to share accountability for the responsible recycling and reuse of electronic equipment.

The law applies to computer equipment and televisions intended for consumer use. Computer equipment includes desktop and portable computers, monitors and video displays for computers, printers, scanners or combination printer-scanner fax machines, mice, keyboards and other peripherals. Household items such as cell phones, video recorders, cable or satellite boxes, and all commercial devices such as printers and data networking systems are not covered devices under the law.

Manufacturers' Responsibilities

Before selling equipment in North Carolina, manufacturers must register with the state and pay a registration fee, which is dependent upon the type of equipment and recycling plan level. Television and computer equipment manufacturers have different recycling obligations under the law. Television manufacturers are assigned a target weight to recycle based on their market share. Computer manufacturers are required to have a plan in place to make recycling of computers available to consumers. The law is designed to provide electronics recycling opportunities for the "consumer," defined as an occupant of a dwelling who used the equipment for personal or home business use. A nonprofit organization with fewer than 10 employees is also considered a consumer.

Television manufacturers pay an annual fee of $2,500. Each television manufacturer is obligated to recycle or arrange for the recycling of its market share of televisions and must annually report the weight of televisions they recycled or arranged to recycle.

Computer manufacturers pay an initial fee of $10,000 to $15,000 and then an annual fee of $2,500 - $15,000, depending on the level of their plan. Computer equipment manufacturers must provide a plan which will provide a mechanism through which consumers can recycle their equipment. The plans must provide for free and reasonably convenient recycling. The related recycling and transportation must be accomplished using environmentally sound management practices. Manufacturers must provide a consumer recycling education program and a toll-free phone number. Each registered computer equipment manufacturer must also submit an annual report detailing the total weight of computer equipment collected for recycling and reuse for the previous year, summarizing the actions implemented from an approved plan.

Retailer's Responsibilities

Effective July 1, 2011, retailers in North Carolina may only sell televisions, computers, printers, scanners, printer-scanner-fax combinations, mice, keyboards, and other computer peripherals which display the manufacturer label of a registered manufacturer in compliance with the electronics management law.

State Agencies and Governmental Entities Responsibilities

State agencies and governmental entities in North Carolina may only buy televisions, computers, printers, scanners, printer-scanner-fax combinations, mice, keyboards, and other computer peripherals which are produced by registered manufacturers in compliance with the electronics management law. A list of manufacturers who are in compliance, updated whenever a change occurs, can be viewed on the following webpage: http://deq.nc.gov/about/divisions/waste-management/solid-waste-section/electronics-management

Registration of facilities recovering or recycling electronics

As of Aug. 1, 2015, facilities that recover or recycle covered devices or other electronic devices diverted from the waste stream for transfer, treatment or processing must register annually with the department on or before Aug. 1 each year. The registration form can be found on the N.C. Division of Waste Management website's at http://deq.nc.gov/about/divisions/waste-management/solid-waste-section/electronics-management/electronics-recyclers-collectors.

Recycling Rates within North Carolina

Data on the recycling of computer equipment and televisions comes from two primary sources: manufacturer reports and local government solid waste annual reports. The table below presents information reported by manufacturers registered in North Carolina.

Type of Collection	Computer Equipment Manufacturers (lbs.)	Television Manufacturers (lbs.)
Mail-back Program	12,445	0
Retail Collection	1,831,651	3,050,446
Scheduled Collection Events	0	204,798
Permanent drop-off through local government programs	1,549,117	13,578,608
Permanent drop-off sponsored by manufacturers	1,351,460	403,038
Total	**4,744,673**	**17,236,890**

As in previous years, permanent drop-off and retail drop-off locations are the option consumers utilize for the majority of their electronics recycling. Although mail-back programs are an important option for rural areas with fewer drop-off locations available, the weight collected through these programs continues to be relatively small. Almost 90 percent of televisions being recycled by consumers are brought to local government programs.

County and Municipal Collection Programs	FY2009-10 (tons)	FY2010-11 (tons)	FY2011-12 (tons)	FY2012-13 (tons)	FY2013-14 (tons)	FY2014-15 (tons)	FY2015-16 (tons)
Televisions	993.48	3,019.39	6,423.58	8,739.47	9,314.94	10,025.66	12,057.66
Other Electronics	3,580.15	4,432.15	8,264.91	5,419.81	5,470.99	5,050.77	4,623.86
Total	**4,573.63**	**7,451.54**	**14,688.49**	**14,159.28**	**14,785.93**	**15,076.43**	**16,681.52**

Recycling rates indicate that the citizens of North Carolina continue to discard a backlog of televisions but the backlog of computers appears to have been cleared.

Overall Recycling of Electronics	FY2009-10 (tons)	FY2010-11 (tons)	FY2011-12 (tons)	FY2012-13 (tons)	FY2013-14 (tons)	FY2014-15 (tons)	FY2015-16 (tons)
Manufacturer television collections	NA	1,754.23	2,732.96	1,623.54	2,460.26	2,834.12	1,743
Manufacturer computer equipment collections	NA	2,895.82	3,996.03	2,098.88	1,843.43	1,193.37	1,598
Local Government television	993.48	3,019.39	8,264.91	8,739.47	9,314.94	10,025.66	12,057.66
Local Government other electronics	3,580.15	4,432.15	6,423.58	5,419.81	5,470.99	5,050.77	4,623.86
Total Tons	**4,573.63**	**12,101.59**	**21,417.48**	**17,881.70**	**19,089.62**	**19,103.92**	**20,021.97**
Total Pounds Per Capita	**0.98**	**2.5**	**4.43**	**3.66**	**3.87**	**3.84**	**3.98**

Compliance and Enforcement of Electronics Laws

Some companies have not registered or paid their fees. These companies are ineligible to market their products in North Carolina. Residents and government agencies can check the N.C. Division of Waste Management's website, http://deq.nc.gov/about/divisions/waste-management/solid-waste-section/electronics-management, to determine which companies may sell in North Carolina.

The Division of Waste Management and the Division of Environmental Assistance and Customer Service have been coordinating with manufacturer stakeholder groups, as well as a national consortium of states with electronics programs – Electronics Recycling Coordination Clearinghouse (ERCC), to seek ways to streamline and automate reporting requirements for North Carolina. Manufacturer reporting requirements vary greatly from state to state. North Carolina has joined with other states in allowing manufacturers to register via web access at http://www.ecycleclearinghouse.org.

Electronics Management Fund

The Electronics Management Fund, administered by the N.C. Division of Waste Management, consists of computer and television manufacturers' registration and annual fees. Fees paid into the electronics management fund are used to support approved electronics management programs within North Carolina counties.

Electronics Management Fund		
Balance of Funds as of July 1, 2015		**$703,709.05**
Debits		
Distributions to Local Government Programs	[$873,930.28]	
Cost of Market Share Data	[$6,162.09]	
ERCC Membership	[$6,000.00]	
Administrative and Salary Costs	[$39,900.31]	
Total Debits		**$925,992.68**
Credits		
Computer Equipment Manufacturer Fees	$362,500.00	
Television Manufacturer Fees	$37,500.00	
Total Credits		**$490,000.00**
Ending Balance June 30, 2016		**$267,716.37**

Electronics Management Fund and Public Electronics Recycling Programs

Approximately 83% of electronics recycled in North Carolina come through local government programs. An analysis of the entire stream managed by the local governments reveals that televisions comprise nearly 60% of the total materials handled by community programs. The following table illustrates the overall proportion each type of equipment represents in the recovered stream.

Types of Equipment Recovered by Local Programs

In 2016, the full cost of electronics recycling through local government programs was estimated to be approximately $0.735 per person. Local Governments can become eligible for funds, by implementing an electronics management plan, submitting the solid waste and materials management report, and using an electronics recycler/vendor that holds the e-Stewards or R2 certification. Although costs to operate local government programs vary significantly, the 2016 covered approximately 13% of the estimated statewide costs of operating the programs. Because of consolidation among electronics manufacturers and an increasing number of computer manufacturers choosing to register with a Level II plan, the distribution amounts may vary in the future.

The cost to recycle televisions is higher than other types of electronics. The table below shows the mixture of electronics being collected by local government programs. The quantity and percentage of televisions being collected by an individual county has a significant impact on the overall costs to the county to run their program.

Types of Equipment Recovered by Local Programs

Equipment Type	FY 2014-15	FY 2015-16
CRT Televisions	55.0%	56.8%
FPD Televisions	4.0%	4.3%
Computer Monitors	10.7%	11.3%
Other Covered Devices	10.3%	7.0%
Non-Covered Devices	20.0%	20.6%

Electronics programs are required to prove to the N.C. Division of Waste Management that all recycling of computer equipment and televisions is being conducted by R2 or e-Steward-certified facilities in order to receive future distributions. The funding must be used only for management of electronics. The 82 local governments with approved electronics recycling plans received their per capita share of a total $859,424.25 in distributions from the Electronics Management Fund in Feb. 2016. The distribution amounts can be viewed at: http://deq.nc.gov/about/divisions/waste-management/solid-waste-section/electronics-management and are shown below.

Electronic Management Distribution FY 2015-16				
County	Distribution		County	Distribution
Alamance	$14,933.73		Lee	$5,703.72
Alexander	$3,642.40		Macon	$3,315.05
Alleghany	$1,068.59		Madison	$2,078.07
Ashe	$2,642.65		Martin	$2,283.14
Bladen	$3,380.62		McDowell	$4,363.33
Buncombe	$24,192.33		Mecklenburg	$97,539.27
Burke	$8,441.01		Mitchell	$1,523.60
Cabarrus	$11,053.81		Moore	$8,961.39
Camden	$982.62		Nash	$10,767.00
Carteret	$6,676.90		New Hanover	$20,888.06
Catawba	$15,082.86		Northampton	$2,044.28
Chatham	$6,411.56		Onslow	$18,572.86
Cherokee	$2,642.94		Orange	$13,573.51
Chowan	$1,409.13		Pamlico	$1,264.81
Clay	$1,039.23		Pasquotank	$3,825.71
Cleveland	$9,424.25		Pender	$5,471.40
Columbus	$5,548.71		Perquimans	$1,313.04
Concord, City of	$8,224.86		Person	$3,780.37
Craven	$10,063.01		Pitt	$16,811.06
Cumberland	$31,714.36		Polk	$1,998.06
Dare	$3,409.70		Randolph	$13,779.93
Davidson	$15,309.31		Richmond	$4,385.00
Davie	$3,993.24		Robeson	$12,878.09
Durham, City of	$23,502.50		Rockingham	$8,909.88
Edgecombe	$3,728.96		Rowan	$12,447.63
Forsyth	$35,013.34		Rutherford	$6,508.99
Franklin	$5,989.81		Sampson	$6,202.44
Gaston	$20,186.87		Scotland	$3,453.12
Gates	$1,146.87		Stanly	$5,901.76
Granville	$5,594.15		Stokes	$4,564.94
Guilford	$50,090.81		Swain	$1,427.90
Halifax	$5,121.04		Transylvania	$3,218.39
Harnett	$12,111.04		Vance	$4,339.94
Haywood	$5,768.32		Wake	$95,277.11
Henderson	$10,675.72		Warren	$1,975.05
Hertford	$2,366.33		Washington	$1,220.71
Hyde	$552.44		Watauga	$5,110.93
Iredell	$16,061.63		Wayne	$12,105.36
Jackson	$3,950.78		Wilkes	$6,720.42
Johnston	$17,350.31		Wilson	$7,768.99
Jones	$1,007.84		Yadkin	$3,643.36

Total of Distribution: $859,424.25

Chapter 7
Department of Administration - Environmentally Preferred Purchasing

For more information regarding this report, please contact:
William Sam Byassee, deputy director of the Division of Purchase and Contract, at 919-807-4533 or sam.byassee@doa.nc.gov.

The Department of Administration continues to promote the purchase and use of sustainable, and efficient supplies and products. As the department progresses with this effort, more of these products are being added to statewide term contracts and agency specific term contracts awarded through open market bids. For more information, visit the Division of Purchase and Contract's (P&C) website at: http://www.ncpandc.gov/.

Solicitations advertised by the Division to Comply with N.C.G.S. 130A - 309.14(a)(3)

Bids advertised in the Division of Purchase and Contract contain a Recycling and Source Reduction section in paragraph 8 of the Instructions to Bidders. Also, in the Sustainability section in paragraph 9, the division encourages bidders to support its sustainability efforts by requesting bidders to reduce use of paper and non-recyclable elements in their bid submission. When developing bid invitation language, requirements and specifications, purchasers are continuing to look at alternative methods and products that result in waste reduction, if their procurement is practicable and cost-effective.

Recycling and source reduction information provided by the contractors on bids received during the 2015-16 fiscal year indicate the sustainable features or criteria of those products. Sustainable attributes include reduction, more efficient, more durable, longer lasting, reusable, refillable, repairable, refurbished, recyclable, washable and less toxic than their traditional counterparts. Efficient resource use includes Energy Star products for reduced electric energy demand and reduced water consumption.

Refer to the Examples of Sustainable Open Market Awards and the listing of the Statewide Term Contracts with the applicable sustainable features identified.

Table 1 lists the IPS purchase awards by the type and dollar amounts awarded by the Division of Purchase and Contract.

Table 1

IPS Commodity Purchase by Bid Type	Number of awards by Bid Type	Percentage of Number of Awards by Bid Type	Award dollars by Bid Type	Percentage of Award Dollars by Bid type
Agency RFP (including services)	149	10%	$258,105,950.17	28%
Agency Specific Term Contract	205	13%	$109,040,835.63	12%
Contractual Service	9	1%	$41,475,309.78	4%
Open Market Purchase	378	25%	$28,669,631.29	3%
Purchase from Quote	193	13%	$76,212,296.72	8%
Statewide Term Contract	58	4%	$346,911,640.36	37%
Waiver of Competition	537	35%	$76,149,554.30	8%
Grand Total	1,529	100%	$936,565,218.25	100%

NC E-Procurement @ Your Service

As of December 2016, the enterprise-wide system has 55,378 registered vendors and 11,513 users representing 171 entities statewide. This includes state agencies, hospitals and institutions, community colleges, K-12 public schools, universities and local governments. NC E-Procurement @ Your Service continues to contribute to a sustainable environment through significant reductions in hard copy document reproduction (paper, printers and supplies) through the use of electronic business transactions and electronic documents. NC E-Procurement also continues to support state priorities for environmentally preferable products with more than 4,485 catalog items clearly marked as "Recycled" of a total of more than 121,084 catalog items, as of December 22, 2016.

Purchasing Compliance Reviews

North Carolina Administrative Code (01 NCAC 05B .1605) mandates that the Division of Purchase and Contract conduct compliance reviews on purchasing practices of all state agencies (institutions, hospitals, community colleges, universities and state agencies). All compliance reviews, except universities, are conducted using data from the NC E-Procurement System. Electronic data reduces the necessity of conducting most phases of the analysis on-site, thereby increasing efficiency, as well as reducing travel costs, fuel emissions and operating expenses.

Procurement Training

Since 2013, the Division of Purchase & Contract's (P&C) training program has offered North Carolina public procurement personnel and contract administrators the skills necessary to carry out their duties efficiently and effectively. As the program reaches its fourth year, P&C continues to expand the list of procurement trainings. The procurement training program currently consist of nine (9) core classes. The classes are offered free of charge. The only costs incurred by North Carolina agencies are travel-related expenses. In order to minimize impact to agency business operations and travel-related expenses, the classes are offered regionally throughout the state. Web-based trainings are also available for those who are unable to travel. Overall, P&C's training program prepares purchasers across the state to recognize and seek out opportunities to provide reused, recycled and sustainable items to satisfy the state's needs.

In addition to these classes, P&C also offers E-Procurement and eQuote trainings. Each calendar year, the Division typically offers 22 E-Procurement and eQuote classes with about 507 total participants.

IPS (Interactive Purchasing System) & electronic Vendor Portal (eVP)

The Division of Purchase and Contract continues to promote opportunities for vendors to do business with the state through electronic advertisement of goods, services and design/construction in IPS. The entities using this system consist of state agencies, institutions, universities, community colleges, K-12 public schools and local governments.

eVP is an internet application that allows companies and individuals to register to do business with the state of North Carolina. eVP had about 160,000 registered vendors as of November 30, 2016. The system continues to grow with the addition of users, increasing to some 600 agencies, schools and institutions in North Carolina, with 1,200 purchasers posting 30,000 solicitations through the database during the 2015-16 fiscal year.

Division of Surplus Property

The N.C. Division of Surplus Property in the state Department of Administration has the responsibility to dispose of the state's used property. It uses contracts coordinated through the state Division of Purchase and Contract to drive its recycling program. In 2015-16, it has recycled 366,766 gallons of used oil, some 414,628 pounds of batteries, 4,553 tons of tires, 365,750 pounds of pallets and more than 3,781 tons of scrap metal. Additionally, this Division oversees electronics and antifreeze recycling.

Examples of Sustainable Open Market Awards

Table 2, on the following page, lists examples of used, recycled and refurbished open market (non-term contract) awards made through the Division of Purchase and Contract during the 2015-16 fiscal year, representing a total value of more than $2.4 million. These purchases were made by the state's 24 principal departments and 58 community colleges using the division's NC E-Procurement @ Your Service electronic ordering system.

Table 2

Description	Purchasing Agency	Award Amount
Used Tractor	Caldwell CC	$28,000.00
Used Helicopter	Guilford Tech CC	$35,612.50
Used 53’ Trailer	Cleveland CC	$21,900.00
Used Weapons	Fayetteville Tech CC	$25,219.14
Used Forklifts	Wayne CC	$27,000.00
Refurbished Exercise Equipment	Catawba Valley CC	$23,500.00
Used Zoll M-Series Defibrillators w/paddles and carry bag	Rockingham CC	$ 11,769.00
Used 2015 Chevrolet Cruze LT	Vance/Granville CC	$ 14,424.30
Used Thermo Scientific picoSpin 45 NMR Spectrometer	Gaston College	$ 17,698.15
Used 2010 International Tractor	Cape Fear CC	$30,000.00
Refurbished Beds	Fayetteville Tech CC	$25,334.00
Used 2011 International Truck	Sampson CC	$46,095.00
Used Ambulance	Beaufort County CC	$18,500.00
Refurbished Anesthesia Machine	Rockingham CC	$10,371.85
Used Cubicles	Dept. of Administration	$25,700.00
Used Backhoe	Dept. of Wildlife Resources	$46,700.00
Used Caterpillar 312E Excavator	Dept. of Wildlife Resources	$124,000.00
Used 24 Mono BEB Tug	Dept. of Transportation	$200,000.00
Refurbish Breakers	Dept. of Natural & Cultural Resources	$40,500.00
Used Crawler Dozer	Dept. of Wildlife Resources	$135,235.00
Used Mini-Excavator with attachments	Dept. of Wildlife Resources	$68,290.44
Used 2014 LeeBoy 685C Motor Grader	Dept. of Wildlife Resources	$128,000.00
Used International 7500 Rollback Truck w/Jerr Dan Rollback Bed	Dept. of Wildlife Resources	$98,000.00
Used Bus for Safari Ride	Dept. of Natural & Cultural Resources	$42,287.00
Used Bus for Safari Ride	Dept. of Natural & Cultural Resources	$20,858.75
Used 2011 Ottawa Yard Tractor	NC State Ports Authority	$58,200.00
Used Printing Press	Dept. of Public Safety	$957,412.50
Refurbished Storage Containers	Dept. of Public Safety	$56,519.50
Used 2003 International Box Truck, 16’ box w/lift	Murdoch Center	$24,470.00
Used 2010 Ford Panel Cargo Van	Murdoch Center	$16,788.75
Used Ford F350 12-Passenger Van	Murdoch Center	$24,500.00
	Total Value:	$2,402,885.88

Statewide Term Contracts

As existing term contracts are re-bid and new term contracts are developed, the state Division of Purchase and Contract continues to improve contracts by offering a wide range of sustainable or environmentally friendly products. Examples of the sustainable features of these term contracts are listed below.

- **Oils, Lubricants, Greases, and Antifreeze, 001A** –Correction Enterprises provides synthetic, bio-degradable and recycled lubricants. Synthetic lubricants are longer-lasting than conventional, and the following types were purchased: motor oil (8,565 gallons), gear lubricant (11,386 pounds), automatic transmission fluid (2,876 gallons), and grease (over 2,000 pounds). Biodegradable lubricants are better for the environment, and the following types were purchased: bar & chain oil (42 gallons), two-cycle oil (21 gallons), hydraulic oil (500 gallons) and tractor transmission fluid. Several fluids are also available in bio-synthetic formulations (two-cycle oil, bar & chain oil, motor oil, hydraulic oil and marine oil. Additionally, re-refined used motor oil is available (313 gallons sold), as is recycled antifreeze. State Surplus Property disposes of waste oil and antifreeze under contract. This year, 40,322 gallons were purchased of Diesel Exhaust Fluid (DEF), an aqueous urea solution used in diesel engines to lower nitrogen oxides concentration in exhaust emissions. Nitrogen oxides, like hydrocarbons, are precursors to the formation of ozone and also contribute to the formation of acid rain.

- **Filters, Air (HVAC)**, **031B** – Extended-surface and electrostatically-enhanced filter offerings result in lower HVAC pressure drop, resulting in less energy use. Extended-surface filters also last much longer than traditional panel filters.

- **Appliances, Domestic, 045A** – All refrigerators, washers and dishwashers covered by this contract are Energy Star Qualified.

- **Automotive, Industrial Parts and Supplies, 060A** - Some products included have recycled materials with 10 percent-20 percent post-consumer content.

- **Batteries, Storage, 060B** - Typical lead-acid batteries contain 60 - 80% recycled lead and plastic, according to the EPA. Battery cores (spent batteries) are considered to be an environmental hazard and are otherwise expensive to properly remove. All State agencies are required to dispose of battery cores under a separate battery recycle contract (LAB082714) administered by the State Surplus Property Agency.

- **2017 Vehicles, 070A** – According to the Steel Recycling Institute, 60 percent of a typical vehicle is steel or iron. Of that steel or iron, 25 percent of the shell of a vehicle is recycled material. Nearly 100% of the steel and iron of a retired vehicle is recycled. The current contract focuses on providing fuel-efficient vehicles, while also reducing fossil-fuel reliance through alternative fuels (E85 ethanol flex-fuel, CNG compressed natural gas, LPG liquefied petroleum gas (propane), AFV gasoline/electric hybrids, all-electric, B20 biodiesel).

  Cars**:** All 2017 gas-model sedans are 4-cylinder compacts or mid-sized, with E85-capable engines, and have an option for CNG/LPG-capable engines (Ford Focus, Ford Fusion). Also available are hybrids (Ford C-Max, Chevrolet Volt), and an all-electric model (2016 Ford Focus).

  SUVs: All 2017 models have an option for CNG/LPG-capable engines, and include a 4-cylinder crossover (Dodge Journey) and a 6-cylinder mid-size (Nissan Pathfinder).

  Vans: Passenger vans all have an option for CNG/LPG-capable engines, and include a 4-cylinder compact (Dodge Caravan), plus full-size 6-cylinder models with E85-capable engines (Ford Transit Wagon, Ford Transit 350, Ford Transit XL). Cargo vans also all have an option for CNG/LPG-capable engines, and include a 4-cylinder compact (Nissan NV200), plus full-size 6-cylinder models with E85-capable engines (Ford Transit 250, Ford Transit 350). The cube van also has an option for a CNG/LPG-capable engine.

  Pick-up trucks: These trucks include a 6-cylinder (Ford F150), or 8-cylinders with an option for ultra-low sulfur or B20 fuel capability (Ford F250, Ford F350). All pick-ups have an option for CNG/LPG-capable engines.

  Cab and Chassis trucks: all gasoline versions may be purchased as diesels with ultra-low sulfur or B20 fuel capability.

  Law Enforcement Vehicles: requiring more power for pursuit purposes, there is still a 6-cylinder sedan and a 6-cylinder SUV, in addition to 8-cylinder models. All are E85 flex fuel compatible, and have an option for CNG/LPG-capable engines.

- **Conventional School and Activity Buses, 070C** – Vehicles typically contain approximately 20 percent post-consumer recycled material by weight and 80 percent of the vehicle by weight is recovered for reuse. Used school buses are usually sold or are used for spare parts. There is an option to have a propane-powered engine.

- **Propane, 405A** – Propane is the third most popular vehicle fuel in the world. It is produced as a by-product of petroleum refining or natural gas processing, with about 90% of the US supply produced domestically. Propane is a cleaner and cheaper fuel than the other two, with a higher octane rating.

- **Diesel, 405B –** This contract covers bio-diesel (B20) and ultra-low-sulfur diesel #2. B20 blended fuel contains 80 percent diesel fuel and 20 percent virgin soy or reprocessed vegetable oil, resulting in a reduction of crude oil consumption. Compared to regular diesel, B20 biodiesel reduces emissions as follows: unburned hydrocarbons – 20%, carbon monoxide – 12%, particulate matter – 12%. Nearly 2 billion gallons of biodiesel were produced in the U.S. in 2015. Ultra-low-sulfur diesel has 15 parts per million (ppm) of sulfur content compared to 500 parts per million sulfur content of the diesel primarily used in the past, resulting in less black soot and smell.

- **Gasohol, 405C –** A mixture of gasoline and ethanol, the ethanol content reduces emissions. Under the right conditions, carbon monoxide emissions may be reduced by up to 30%. Ethanol is derived from biomass, including crop waste that would otherwise be left in the field. As such, ethanol is a renewable energy source that reduces dependence on fossil fuels. E10 (10% ethanol) is compatible with any gasoline vehicle. E85 (85% ethanol) is for flex-fuel vehicles (FFV) only**.**

- **Pipeline Natural Gas, 405N** – Originally an unwanted by-product of producing oil, natural gas used to be burned off at the oil fields if cost-effective transportation for it was not available. Today, it is considered a valued commodity that is often returned to its reservoir for future recapture if transportation is problematic. Natural gas produces less carbon dioxide per joule of energy delivered than oil (29% less) and coal (44% less).

- **Furniture, All Types, 420A** - Contractors support sustainability through different practices. Mechanical parts can be recycled or replaced, thereby extending service of the item. Packaging is recyclable. Wood may be ground up into particleboard. Packaging may contain from 15 percent-to-75 percent post-consumer waste and is reusable. Wood, plastic and metal contain recycled post-consumer content and are recyclable. Product offerings are using more sustainable methods because they offer a competitive price advantage compared to those who use all virgin materials. Soy foam in chair seats and backs is now becoming available and is more environmentally friendly because it is made partly from soybeans, a renewable resource.

- **Bedding Mattress Term Contract, 420E** - Mattresses comprised of innersprings (similar to the type used primarily in the residential and hospitality bedding industries) now require successful evaluation to the 16 CFR Part 1633, the Consumer Product Safety Commission's new mattress flammability testing standard, "Standard for the Flammability (Open Flame) of Mattress Sets." Successful evaluation of products offered continue to require the 16 CFR Part 1632, Standard for the Flammability of Mattresses and Mattress Pads (directed toward cigarette ignition of mattresses). The revised specifications promote increased safety and durability to extend product life.

- **Industrial, Medical and Specialty Gases, 430A** – These gases are delivered statewide in reusable cylinders and are exchanged when replacement cylinders are needed.

- **Maintenance, Repair & Operation Supplies, 445B** – Items which were offered under the following contracts are now covered under this contract: Ballasts (285B), Dry Cell Batteries (450A), Energy Saving Devices (285D), LED Lighting (285C). Lamps may contain up to 65 percent recycled content, including glass and mercury. Lamp packaging that may contain 73 percent recycled content. Some of the lamps are low mercury (TCLP compliant), non-hazardous. Low-flow plumbing fixtures are offered to reduce water consumption.

  Ballasts – electronic types are available that are up to 30% more energy efficient, last longer**,** support variable illumination and reduce electromagnetic radiation compared to the older magnetic ones. Electronic ballasts contain no PCBs and can be disposed in the trash. Reduced product shape and size (form factor) also minimizes packaging and metal enclosure requirements.

LED Lighting – Contract consists of lamps for cove lighting, area lighting, downlights, troffers and wall packs employing LED illumination for energy savings. Packaging is 60 percent recycled materials. LED illumination uses 80% less energy than incandescent bulbs and lasts up to 25 times longer.

Energy Saving Devices – Contract includes T8 size tubular fluorescent retrofit kits, LED exit signs, LED exit sign retrofit kits, occupancy/vacancy sensors, electronic dimmable ballasts, and controls. Products use LED illumination and dimmable ballasts for energy savings. T8 fluorescent lighting provides higher energy efficiency and less heat generation than older T12 lighting.

- **Locks, Locking Devices & Accessories, 450B** – Product metal content includes 26-31 percent pre-consumer recycled materials and 4-6 percent post-consumer recycled materials. Some models support the material and resources credits for Leadership in Energy and Environmental Design (LEED) building certifications.

- **External Defibrillators, 465B** - Defibrillators can be refurbished and packaging materials can be recycled.

- **Grounds Maintenance Equipment, 515B** – Contract includes, walk behind products/equipment, mowers and lawn and garden tractors, hand-held equipment, tractors, utility vehicles, golf and turf equipment, and other equipment. This equipment typically contains 20 percent recycled steel and plastic.

- **Vehicle Dedicated & Bi-Fuel Propane Conversion Kits** (557A, 557B) and **Vehicle Natural Gas Conversion Kits** (557C, 557D) – These contracts enable existing vehicles to be converted from 100% gasoline-fueled into cleaner-burning propane- or natural gas-fueled.

- **Office Supplies, 615A -** Contractors are required to the extent feasible and practical, to offer recycled products, including packaging, especially those having post-consumer waste content. Wherever possible and practical, these products should be identified with their recycled content.

- **Remanufactured Toner Cartridges, 615A** - All spent toner cartridges under this contract are to be collected by the vendor during regular office supply deliveries, and complimentary recycle bins are available.

- **Napkins, Bathroom Tissue & Paper Towels, 640A** – All products on the contract are certified to Green Seal standard GS-1 or Ecologo. Paper products are manufactured from 100 percent recycled fiber, with 40 percent to 70 percent of that recycled content being from post-consumer content. Products are manufactured using either elemental chlorine-free or chlorine-free systems. This is an example of the use of recycled materials.

- **Office Paper, 645A –** All available paper types on this contract offer 30 percent post-consumer content choices, compliant with the EPA's Comprehensive Procurement Guidelines (CPG). Recycled paper reduces landfill waste while conserving forest resources.

- **Bags, Plastic, Trash, 665B** - Liners contain a minimum of 10 percent post-consumer or pre-consumer reprocessed copolymer. High-density material options are offered that utilize up to 70% less plastic than the same strength low-density material. All the liners awarded were thoroughly evaluated for strength and performance.

- **Agricultural Chemicals, 675A** – Recyclable containers are encouraged when available.

- **Ammunition, 680A** - Brass shell casings can be saved and recycled and other casings can be reloaded.

- **Construction Equipment, 760H** – Construction Equipment covers excavators, wheel excavators, track loaders, compact track loaders, wheel loaders, skid steer loaders, backhoe loaders, crawler dozers, crawler loaders, wheel dozers, motor graders, utility cranes, and compactors. Appropriate attachments or equivalent products are included in the contract. Equipment manuals and parts catalogs are provided in hard copy and electronic copies. Engines meet current EPA Tier and emissions guidelines.

- **Tires and Tubes, 863A** – Tires, depending on the manufacturer, may contain from 1.55 percent to 2.5 percent recycled material based on the product attributes, speed rating and performance criteria.

- **Teaching Equipment, Electricity/Electronics Courses, 924A** - Office paper, cardboard and metal enclosures have recycled content. Documentation may be provided in soft copy instead of hard copy printed materials.

- **Recycling Services for Fluorescent Lamps, Ballasts & Other Mercury Containing Devices, 926B** – This contract assists agencies and local governments with contracted disposal of products containing mercury, diverting that toxic material from landfill disposal.

- **Electronic Equipment Recycling Services, 926C** –North Carolina requires that its recycled electronics not contribute to unsafe and environmentally damaging processing practices. The purpose of this contract is to assist agencies in complying with the state's electronic recycling requirements by providing recycling service options for end-of-life electronic equipment, including the collection, de-manufacturing, and recycling of computer monitors, televisions, desktop CPUs, laptop computers, printers, scanners, keyboards and mice, copy machines, tablets, DVD players, VCRs, stereo systems, tape players, CD players, radios, telephones, cell phones, readers, network equipment, servers, fax machines, electronic games, cable and wire, batteries, and other consumer electronics generated by State of North Carolina agencies and other eligible users. Eligible contract users include county and municipal governments, local education agencies, community colleges, state universities, and other local public agencies or authorities. Some recycled products generate a revenue stream that may be used to pay for the recycling of other products.

- **Vehicle Rental Services, 975B** – Among the vehicles available are compacts, hybrids, and alternative fuel vehicles.

Items Aiding Waste Reduction Purchased by State Agencies through Term Contracts and Open Market Purchases

The following items purchased by state agencies meet the criteria for aiding waste reduction by being reusable, refillable, repairable, more durable, and/or less toxic than their traditional counterparts:

Reusable
Refrigerant Recovery System (filters reusable refrigerant), Recycled Carpet fiber, Re-refined Motor Oil, Recycled Paper fiber, Recycled Antifreeze,
Recycled Content Furniture (not traditional wood),
Printers, Toner Cartridges, Uniforms

More Durable
Above-Ground Vaulted Fuel Storage Tanks,
Classroom Furniture, Electronic Lamps & Ballasts,
Vacuum Cleaners, Floor Polish,
Grader Slope Attachment,
Plastic Lumber, Mattresses,
Vertical File Cabinets, Wood Case goods,
Wood library furniture, LED Lighting

Energy Star – Reduced Energy Consumption
Audio Visual System,
Changeable Message Signs – Solar Powered,
Domestic Appliances,
Lighting Fixtures, Lamps, Warning Lights - Vehicles Safety,
Water Coolers

Flow Plumbing Fixtures for Reduced Water Consumption – 0.5 GPM lavatory facet nozzles and 1.5 GPM showerheads support the Governor's water

Used – Breakers, Cubicles, Heavy Machinery, Helicopters, Lab Equipment, Medical Equipment, Printing Press, Storage Containers**,** Trailers, Vehicles (automobiles, buses and trucks), Firearms

Repairable
Defibrillators, Musical Instruments

Refurbished/Rebuilt
Beds, Breakers, Exercise Equipment, Medical Diagnostic Equipment & Instrumentation,
Remanufactured Toner Cartridges,
Scientific Equipment, Storage Containers

Longer-Lasting
Floor Maintenance Machine Batteries, Library Furniture, Aluminum Nuts and Bolts – non-rusting alloys, Fluorescent electronic ballasts permit longer lamp life, LED lighting, extended-surface HVAC air filters, synthetic lubricants

Less-Toxic
Alternative Fuel Vehicles, Compact Vehicles, Hybrid Vehicles, Electric Vehicles, Dry Cell Batteries, Electronic Lamps & Ballasts, Fertilizers/Farm Chemicals, Inks for printing (using non-petroleum based inks), Instructional Art Materials,

conservation initiative during severe water restrictions throughout the state.

Recycled content
Office Paper, Napkins, Paper Towels, Bathroom Tissue, Plastic Trash Bags, Tires Locks, Vehicles, Furniture, Re-refined Motor Oil, Recycled Antifreeze, Storage Batteries.

Refillable
Ammunition - Cartridge Refills,
Drums – Steel, Fire Extinguishers,
Cylinders for Welding, Medical & Specialty Gases
Fuel Tanks,
Self-Contained Breathing Apparatus,
Toner Cartridges

Markerboard Markers, Mattresses, Scientific Products (eliminating Freon), Refrigeration and A/C Equipment, Synthetic and Biodegradable Lubricants, Chlorine-free Sanitary Paper Products (napkins, paper towels, bathroom tissue), Cleaner Fuels (propane, gasohol, natural gas, bio-diesel), Diesel Exhaust Fluid, Vehicle Fuel Conversion Kits, Disposal/Recycle Programs (mercury content, electronics, oil, antifreeze, pallets, tires, batteries, steel)

Recyclable
Commodity Packaging, Commodity Metal enclosures & parts, Plastics, Steel & Reinforced Concrete Pipe, Chain Link Fencing, Electrical Wire, Treated Lumber, and Motor Oil – refined, HVAC & Refrigeration Equipment – Refrigerants, Toner Cartridges, Motor Oil, Antifreeze.

Chapter 8
Department of Transportation - Recycling and Solid Waste Management Report for Highway Construction and Maintenance Projects

NCDOT 3R PROGRAM
• REDUCE • REUSE • RECYCLE

State Fiscal Year 2015-16

Director Support Services Unit - Keith Wilder

Top- Down Support

Leads the way to the success of

NCDOT 3R Program:

Secretary of Transportation- - Nick Tennyson

"By reducing waste, recycling, and reusing materials - whether on construction sites or day-to-day in the office – we are ensuring that we are operating as efficiently as possible, thereby being good stewards of taxpayer dollars as well as the natural environment."

Chief Financial Officer - David Tyeryar

"It's part of being effective and efficient."

Commissioner Kelly Thomas

"As part of our DMV Reform, we are continuously searching for ways to operate more efficiently. Reducing waste, recycling and reusing materials are simple ways we can achieve this goal, while at the same time supporting jobs in this industry and preserving North Carolina's natural resources."

2015-16 NCDOT employees continue to demonstrate their commonsense approach to handling its waste stream proves to be very successful in diverting materials from the landfill.

NCDOT employees recycled the following for 2015-16 year:

2015-16 Waste Material	Weight
Paper: newspaper, magazines, cardboard, office paper, telephone books, hardback books, etc.	567 tons
Metal: aluminum cans, steel cans, scrap metal, white goods, etc.	3142 tons
Glass Containers: clear, brown, green, and mixed glass	2.2 tons
Plastic: PETE #1, HDPE #2, LDPE #4, mixed plastic, etc.	18 tons
Commingled Containers: single stream collection of aluminum and steel cans, glass and plastic	51 tons
Electronics: monitors, computers, printers, copiers, televisions, etc.	48 tons
Organic materials: wooden pallets, other wood, yard waste, food scraps, cooking grease, etc.	967 tons
Other materials: lead acid batteries, motor oil, white goods, etc.	412 tons
Total	**5207 tons**


2015-16 NCDOT upgraded and added more recycling containers state-wide at our Rest Areas/ Visitor Centers as well as the Ferry Division and Rail Division and it is paying huge dividends in materials collected and recycled from the general public. This year over 32 tons of plastic and glass containers, aluminum cans, newspaper, and cardboard were collected and recycled from these facilities.

2015-16 NCDOT continued with the statewide fluorescent light bulb recycling program with great success. Facility Maintenance diverted 971 fluorescent lamps from the landfill. The program diverted over 2900 bulbs from the landfill.

NCDOT's continuous focus on waste management is educating employees on source reduction, reuse, and recycle practices. These practices will continue to lead in significant reduction in our waste stream and lesson our environmental foot print on the planet.