Executive Summary

This Assessment of the Recycling Industry and Recycling Materials in North Carolina is the third analysis of the recycling industry conducted by the State of North Carolina. The assessment characterizes North Carolina's waste stream for 1997 and 2002 and focuses on supply and demand for 26 recyclable materials. It also discusses trends and highlights changes that have occurred during the years and provides a foundation for North Carolina's recycling market development efforts.

The 1998 assessment follows the general framework established in the previous assessments, including in-depth analyses of multiple commodities, five-year supply / demand projections, including North Carolina and regional supply / demand projections. A new focus on price history has also been incorporated into this assessment including discussion of the factors affecting price history as well as three and five year histories. The data provided were generally taken from Waste Age's *Recycling Times*, which provides ranges of prices for various regions of the country. These data are intended to provide only a general sense of the trend of price fluctuation, and more detailed or accurate price histories may be obtained from commodity-specific sources.

The 12 categories and 26 Commodity Profiles developed for this assessment include:

- Construction and Demolition Debris
- Electronics
- Glass
- Metals
  - Aluminum Cans and Scrap
  - Steel Cans and Scrap
- Oil-Related
  - Used Oil
  - Used Oil Filters
- Organics
  - Food Residuals
  - Yard Wastes
- Paper
  - Old Corrugated Cardboard (OCC)
  - Old Newspaper (ONP)
  - Old Magazines (OMG)
  - Office Paper
  - Mixed Paper
- Plastics
  - PET (#1)
  - HDPE (#2)
  - PVC (#3)
  - L/LDPE (#4)
  - PP (#5)
  - PS (#6)
- Textiles
  - Carpet
  - Post-Consumer Textiles
- Tires
- White Goods
- Wood
  - Wooden Pallets
  - Wood Residues

FINDINGS

Nearly 12 million tons of municipal solid waste were generated in North Carolina in 1997, and eight million tons were disposed. C&D debris made up the largest component of the disposed waste (29 percent), and paper made up another 18 percent. Organic materials comprised about 12 percent of the waste stream, and wood made up 11 percent. All other materials each comprised 10 percent or less.

A conservative estimate of the total tonnage of material recycled in 1997 is 4.1 million tons, which yields a 34 percent recycling rate. The last time the statewide recycling rate was calculated, in 1995, it was estimated at 22 percent (2.1 million tons recycled and 7.6 million tons disposed).

The recycling rates for specific commodities vary. Container recovery rates tend to be low, especially for plastics. Although the paper recovery infrastructure is well established, there is still room for growth in many grades, especially magazines, mixed and office paper. Some other materials are virtually untouched in terms of recycling potential, including C&D, electronics, food residuals, most plastics, and textiles.

Despite limited recovery in some categories, the 1998 assessment found a thriving industry that continues to grow and change. The past several years have seen the introduction of new technologies, expansion of collection systems, and considerable fluctuations in foreign and domestic economic cycles. In addition, recycling companies (both processors and end users) are consolidating in many sectors.

Since the last assessment was conducted, North Carolina has provided business management, technical and financial assistance to 608 businesses. In that period, 185 jobs were created and $5.05 million were invested. The total volume of new capacity created was 217,000 tons per year. More than half of that capacity was construction and demolition (C&D) debris processing.

Another significant development since the last industry assessment is the inception of a recycling business loan fund, supported by the N.C. Department of Environment and Natural Resources (DENR), the U.S. Environmental Protection Agency (EPA), and the Self-Help Ventures Fund (Self-Help). This fund will be administered by Self-Help, and the project will offer at least $660,000 in loans to recycling businesses. These loans are expected to create or retain at least 80 jobs, provide 115,000 tons per year of recycling capacity, and leverage an additional $330,000 of private investment.

PRIORITIES

The ultimate goal of this assessment is to chart the state's current recycling course and to identify where market development assistance is needed to stimulate gains in recovery. As a result of the analyses of 26 commodities in 12 categories, each commodity has been assigned a priority for action.

High priority commodities typically warrant immediate market development assistance and offer opportunities for infrastructure and market development that justify the application of technical, financial, and policy resources. They also often constitute a significant and growing portion of the waste stream or pose potential environmental and health threats due to toxicity. Medium priority commodities require more limited assistance and tend to constitute a smaller portion of the waste stream. Low priority commodities have mature markets and typically do not require action from the state. The recyclable materials analyzed are divided into high, medium and low priorities, and are described in the following sections.

High Priority Materials

C&D debris (e.g., wood, wallboard, concrete, brick, etc.) needs market development assistance. C&D debris represents about a third of North Carolina's waste, yet recovery efforts are limited, primarily because recovery in the state has been focused on other materials and the incentives for disposal diversion have been low. In addition, this portion of the waste stream has only recently been characterized. A variety of activities could stimulate recovery and demand, including state support of demonstration projects and recycled content procurement standards, respectively. The State should continue to identify and assist entrepreneurs that are processing various C&D materials and help expand or replicate those operations around the state. In addition, local governments should be encouraged to establish recovery operations by contract with C&D recovery firms or through their own operations.

The compost market, which represents demand for **food residuals** and **yard waste**, is still developing and needs assistance. While the demand for yard waste appears to meet the available supply, efforts are needed in several areas to improve the recovery of food residuals. Demand for recovered edible foods, animal feeds and food residuals-based compost appears adequate to significantly increase the diversion rate. Developing efficient collection and processing techniques could stimulate recovery, and efforts to increase market awareness of the benefits of compost and mulches would further strengthen demand.

Although most **paper** markets are mature, recovery rates in North Carolina are below national averages, even for higher value papers such as office grades and old corrugated containers (OCC). For this reason, the state should support the development of infrastructure to improve recovery efficiency and rates. For example, recovery of OCC and office paper could be increased by encouraging the creation of mixed commercial paper routes and focusing on small retail / commercial generators. Encouraging the addition of old magazines to local government collections could increase its recovery rates. There is also room for growth in mixed paper recovery; however, stronger demand is needed to justify increased recovery. Research and demonstration of secondary markets for recovered mixed paper could stimulate demand, as could market development efforts focused on recycled paperboard users.

Despite a landfill ban on used oil, a significant amount of residual oil from **used oil filters** may have entered North Carolina landfills in 1997. According to feedback from recycling companies in the Southeast region, infrastructure and markets for all three components of used oil filters are sufficient to justify a disposal ban.

Wood residues and to a lesser extent **pallets** are among the most promising materials in the state in terms of potential for increased diversion. The demand for industrial wood residues in particular appears to be greater than the supply. Primary manufacturers have well-established markets for their residues and achieve high recovery rates. In contrast, secondary wood products manufacturers must process their residues into marketable form. By increasing recovery in the latter sector, North Carolina could reduce materials being landfilled by four percent. In addition, a higher recovery and diversion of pallets will be an important part of the overall management of wood resources in the state.

Medium Priority Materials

Although increasing quantities of **computers and other electronics** are being generated in North Carolina, recovery options are just developing. Existing efforts tend to be limited to larger businesses, leaving small businesses and households without recycling options. Increasing the quantity of electronic equipment recovered from these sectors would require substantial funding from local, state, or federal governments. Pilot projects might offer a chance to examine the economics of local collections. Additionally, the state should develop a formal disposal policy for electronics because of the potentially hazardous components.

Plastics should be targeted for market development assistance; however, limited actions can be taken by the state. Virgin price supports for plastic are very complex, because oil is the raw material; therefore, state actions are generally limited to encouraging the purchase of recycled content plastic products. Recycling is projected to increase 10 percent annually during the next several years, and high-density polyethylene (HDPE) and polyethylene terepthalate

(PET) will remain the dominant recycled resins due to their predominance in the bottle marketplace as well as their ease of collection and separation. State and local agencies could also stimulate recovery by targeting generators of linear / low density polyethylene (L/LDPE).

The **used oil** market requires limited immediate assistance from the state. Based on the current indications of strong demand, North Carolina has an opportunity to recover much of the remaining used oil throughout the state. In particular, the state should focus on increasing the recovery of used oil from the do-it-yourself sector. An advance disposal fee on motor oil purchases could be used to help finance collection.

Low Priority Materials

Color-separated **glass** is a mature market and warrants little or no immediate attention from the state. The supply of processed flint and amber cullet in North Carolina and the southeast is well below the potential demand. Without significant efforts to increase supply, this trend is expected to continue to 2002 and beyond. On the other hand, demand for green cullet is likely the same as supply and most likely will not deviate from this pattern to 2002. It appears overall that the focus of the glass industry is on improving the quality of the current supply rather than increasing quantity. Efforts to increase the markets for mixed cullet and to encourage more efficient handling of collected glass should be investigated.

Aluminum cans, or used beverage containers (UBCs), are a stable market warranting little attention from the State. Demand for UBCs and other aluminum scrap remains strong enough for the material to be recycled by local governments and private industry. An increase in UBC recovery statewide depends more on improved collection efficiency than increased capacity or markets for the material. Markets for other scrap, such as **steel cans**, will need assistance to fulfill the potential for growth. The demand for steel can scrap continues to exceed the supply both nationally and locally, and the ability to increase steel can recycling is not dependent upon future capacity increases. Recycling businesses have an opportunity to capture additional materials, with approximately 90 percent of the supply of steel cans remaining in the waste stream. However, market prices will continue to be negatively affected by the global economic downturn.

Post-industrial **textiles** are a mature market and warrant little or no immediate attention from the State. Post-consumer textiles are not as well established and may justify limited assistance in the form of grants to local governments. The textile recycling industry is currently struggling with low demand (because of the global market situation), which may limit expansion of local government collection efforts in the short-term. **Carpet** recycling programs are developing rapidly, and infrastructure will need to be developed to meet this demand. The key to increasing carpet recovery lies in establishing the collection infrastructure. At present, this is primarily a private sector effort.

The recently established program of **tire** end-use grants represent a major investment by the State in tire market development, and no additional assistance is needed at this time.

Sufficient market capacity exists for the consumption of all **white goods** generated in North Carolina and its border states today and through the year 2002, assuming that the percentage of steel in white goods is not displaced by other, less recyclable materials. Although no additional assistance is needed at this time, continuing the North Carolina White Goods Management Program is an important strategy for the foreseeable future.

OVERALL RECOMMENDATIONS

The following recommendations are based on the study of supply and demand in North Carolina for the 26 commodities analyzed in this assessment. Commodity-specific recommendations can be found at the end of each commodity report.

Policy Recommendations

The following policy recommendations would stimulate recovery and/or demand for recycled materials in North Carolina.

- Implement disposal bans for recyclable materials with well-established collection infrastructure and strong market demand, such as pallets, used oil filters, and OCC.
- Expand procurement of recycled and environmentally preferable products by state and local governments in order to support stabilized, long-term demand for recycled products. This assessment identified the following commodities as candidates for purchasing targets for both state and local governments: carpets, C&D materials, electronics, newsprint, office paper, oil, and wiping cloths.
  Fund and implement the oil and oil filter initiatives outlined in North Carolina General Statutes 130A-309.16 and 309.21-22 and in the 1992 state solid waste management plan.
- Develop an enforcement policy for items contain-

ing cathode ray tubes, such as computer monitors and televisions.

Programmatic Recommendations

The following programmatic recommendations would stimulate recovery and provide data that would enable informed waste management decisions.

- Gather additional data on specific waste streams to enable informed decision-making. Limited data were available for several of the commodities that comprise significant portions of North Carolina's waste stream: C&D debris, food residuals, wood residues, vegetative debris in land clearing and inert debris facilities, and commercial / industrial textiles.
- Enhance local government program efficiency to increase recovery. To increase the quantity of recyclable materials collected throughout the state, equitable, waste reduction-based collection systems such as pay-as-you-throw should continue to be encouraged. Additionally, market analyses have identified the following materials as candidates for local programs: mixed paper (also referred to as RMP), old magazines, OCC as part of an RMP or office mix, textiles, and steel cans.
- Target the small retail / commercial sector to increase material capture and program efficiency. Include materials commonly generated by this sector with relatively stable markets, such as OCC, office paper, steel cans, and glass.
- Increase plastics recovery through incentives and promotion of recycled product procurement. In general, the State should consider increasing the availability of financial incentives, including grant funding for capital purchases that improve collection efficiencies and economic development incentives for end-users, to enhance PET / HDPE / LDPE and polypropylene (PP) recovery and use.
- Continue to educate government, business, industry and the public on the need for and benefits of recycling.
- Continue to promote source reduction and encourage state and local governments to show leadership in this area.