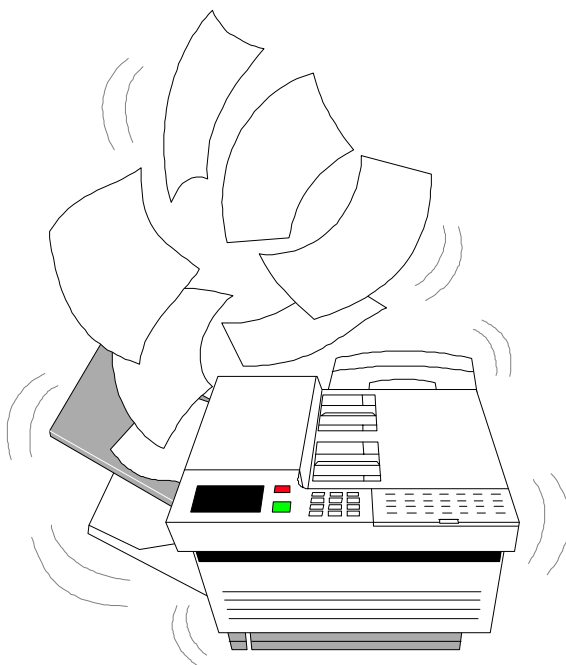


# Paper: Office Paper

## COMMODITY PROFILE

North Carolina Department of  
Environment and Natural Resources  
DIVISION OF POLLUTION PREVENTION  
AND ENVIRONMENTAL ASSISTANCE

MARKETS ASSESSMENT 1998



### OVERVIEW

The official definition of sorted office paper (SOP) describes the grade as “papers typically generated by offices.”<sup>1</sup> Although a majority of paper meeting this description is generated and recovered from offices, it also is generated from homes and other commercial activities. In addition, offices commonly generate paper wastes that cannot be considered “office paper,” such as magazines, newspapers, and corrugated containers.<sup>2</sup>

In 1997, North Carolina generated nearly 187,000 tons of office paper. Of that, almost 30 percent (55,000 tons) was recovered. This recovery occurred primarily in the private sector, with private recovery accounting for about 90 percent of total recovery.

Strong growth in recovered paper deinking facilities in the United States during the early to mid-1990s created new demand for recovered office papers. However, current ca-

capacity is far lower than originally projected in the early 90s because more deinked pulp capacity was brought on-line than was needed. Nevertheless, demand for sorted office paper is expected to improve in 1998, especially if the pulp market improves.

### SUPPLY

#### Generation

In 1997, North Carolina generated 186,773 tons of office paper. Per capita generation of office paper nationally was calculated using EPA data. This factor was applied to North Carolina's population to estimate its generation for 1997 and 2002.<sup>3</sup> In 2002, North Carolina generation is expected to be 198,189 tons.

About 1.4 million tons of office paper were generated in the Southeast region in 1997.<sup>4</sup> This tonnage was estimated by applying the national per capita generation rate to each

**Figure 1: Estimated Generation and Recovery for Office Paper in North Carolina**

	1997	2002
<b>Generation</b>	186,773	198,189
<b>Recovery</b>	54,722	95,131

**Figure 2: Estimated Generation and Recovery for Office Paper in Southeast Region**

	1997	2002
<b>Generation</b>	1,461,763	1,546,168
<b>Recovery</b>	701,646	742,161

state. In 2002, generation in the region is anticipated to be slightly more than 1.5 million tons.<sup>5</sup>

The trend in office paper generation in the 1990s, where generation has remained essentially flat rather than growing, suggests that we may be moving closer to the ideal of a “paperless office.” However, inventory fluctuations and the liquidation of stored inventories also have contributed to this trend. In any case, as office paper generation has leveled, electronic forms of data transfer have experienced significant growth. For example, the percent of households with personal computers has increased every year since 1990 by an average of about 10 percent each year. Electronic mail (e-mail) also has been growing rapidly, with e-mail addresses increasing by more than 20 percent per year for the past six years.<sup>6</sup> As use of electronic media increases, offices may move closer to becoming paperless, reducing office paper generation as a result.

### Recovery

In 1997, almost 55,000 tons of office paper were recovered in North Carolina, yielding a recovery rate of almost 30 percent. The projection for recovery in 2002  $\frac{3}{4}$  just more than 95,000 tons  $\frac{3}{4}$  assumes that North Carolina’s recovery rate for office paper has reached the national average of 48 percent, which may overestimate actual recovery. Experts estimate that national office paper recovery is likely to top off at 50 percent based on current conditions.<sup>7</sup> Recovery was calculated using public and private sector recycling data. Public sector data were derived from responses to the *Annual Solid Waste Management Reports* submitted by local governments, and private sector data came from a recycling survey conducted by DPPEA in the spring of 1998.

Recovery of office paper occurs primarily in the private sector in North Carolina, with private sector recovery accounting for almost 50,000 tons, or 90 percent of total recovery in 1997.

Recovery in the Southeast region was calculated by applying the national recovery rate to generation numbers for the region. This calculation likely over-estimates recovery of office paper in the Southeast, if North Carolina’s recovery rate is representative of the region. Nevertheless, using this assumption, slightly more than 700,000 tons of office paper were recovered in the Region in 1997, and almost 750,000 tons will be recovered in 2002.

Figures 1 and 2 present supply data for North Carolina and the Southeast region.

Understanding the characteristics of the printing and writing (P&W) paper waste stream helps determine the best ways to stimulate recovery.<sup>8</sup> Discarded printing and writing (P&W) paper can be divided into four segments:<sup>9</sup>

- Pre-consumer, which comprises 15 percent of total waste P&W paper.
- Post-consumer office / commercial paper, which comprises 40 percent.
- Post-consumer home papers, which comprise 42 percent.
- Permanent records, which make up about three percent.

Of these four segments, office / commercial offers the greatest potential for recovery. Two likely targets for increased recovery in this segment are multi-tenant office buildings and small businesses in detached buildings. Office paper

**Figure 3: DIP Mills in the Southeast —  
Operating and Proposed but Not Built**

<b>Operating DIP mills in the Southeast</b>		
<b>Company</b>	<b>Location</b>	<b>Capacity (tons/day)</b>
Boise Cascade*	Jackson, Ala.	230
Mississippi River Corp.	Natchez, Miss.	400
Ponderosa Fibres	Augusta, Ga.	180
Ponderosa Fibres	Memphis, Tenn.	200
Union Camp*	Franklin, Va.	350
<b>Proposed but never built DIP mills in the Southeast</b>		
DeNovo Corp.	Radford, Va.	150
Tempico Inc.	Pontotoc Co., Miss.	300

\*Only a portion of the output is marketed; the remainder is consumed internally in the company's mill or mills. Source: *Resource Recycling*, 1997.

recovery is generally most efficient in large buildings. However, such buildings are typically multi-tenant, consisting of many small offices, with waste removal usually handled by the building manager, property management company, or landlord. The typical building manager has many competing responsibilities and coordinating a paper recovery program is not often a high priority, even when desired by some of the tenants. The primary concerns of a building manager are likely to be whether such a program will increase waste hauling costs, inconvenience tenants, or require extensive supervision.

Small businesses in detached buildings are another potential source of office papers for recovery, even though they do not generate nearly the tonnage of office papers as larger businesses or those in multi-tenant buildings. For this reason, they tend not to realize the same economic benefits as larger generators, because the fixed cost of implementing a system is not offset as quickly because of lower tonnage. In addition, some small businesses cannot benefit from reduced solid waste disposal fees as a result of office paper recovery because these fees are incorporated into rent or lease payments. Without the incentive of reduced disposal costs, small businesses may be less willing to support office paper recycling.

A notable trend in office paper recovery is toward ultra- or super-sorted office papers. Deinked pulp mills in particular have begun using this grade to counter two common problems faced in deinking operations: (1) high levels of contamination and outthrows in office papers and (2) wide variability among loads.<sup>10</sup> The quality of the ultra-sort is similar to sorted white ledger (SWL) in that it consists of greater than 80 percent bleached white fiber and is clean, with less than two percent outthrows (contaminants). Ad-

vantages of ultra-sort include cost (it is cheaper than SWL), consistency, and high quality, which enables it to be mixed with lower quality sorted office paper. At least one recycling company in Chicago is developing a large-scale collection and processing system to produce this highly sorted office paper.<sup>11</sup> Thus far, the system has shown that high volumes are required to be cost-effective.

## DEMAND

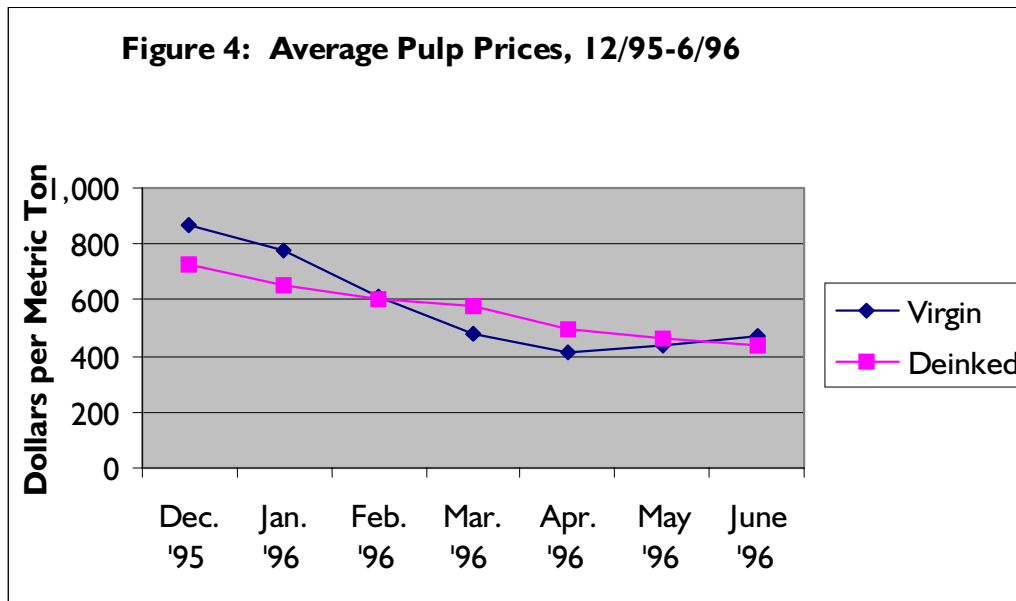
The primary markets for recovered P&W papers are tissue, new P&W papers, and recycled paperboard, according to the American Forest & Paper Association (AF&PA). The association reports the following breakdown among various end uses for recovered P&W papers:<sup>12</sup>

- 25.5 percent is consumed by tissue manufacture
- 25.5 percent by recycled paperboard manufacture
- 23.4 percent by P&W paper manufacture
- 15.9 percent by net exports
- 4.6 percent by newsprint manufacture
- 5.1 percent by all other uses

Insufficient data were available to make demand projections for SOP. A general discussion of the factors influencing demand for office paper follows.

The primary driver of demand for sorted office paper is the strength of the market for deinked pulp (DIP), which tends in turn to be based on prices for virgin bleached kraft market pulp and consumer demand for recycled paper products. The increase in deinking facilities in the United States has been a key factor in increasing the consumption of office paper in recent years. The DIP sector has grown significantly, with capacity more than tripling from 1993 to 1997, rising from 574,000 tons to 1.76 million tons.<sup>13</sup>

**Figure 4: Average Pulp Prices, 12/95-6/96**



Despite this growth, capacity is far lower than originally projected in the early 90s. More than .5 million tons of annual capacity have been eliminated, and some plants operating today are running on greatly reduced or intermittent schedules. Another 15 plants with more than 1.8 million tons of annual capacity were proposed but never built.<sup>14</sup> Figure 3 presents DIP mills, both operating and proposed but never built mills, in the Southeast.

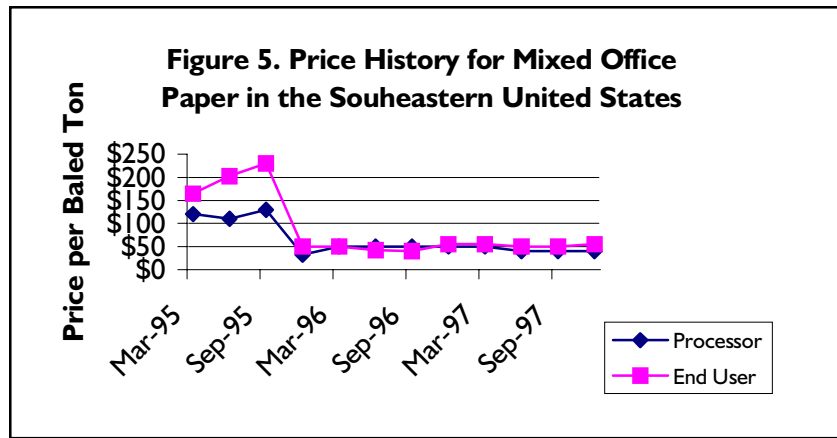
A combination of technical and economic problems kept the DIP industry from meeting expectations. Many of the mills employed new technologies that proved unreliable. Some had to switch to sorted white ledger to meet buyer specifications. At the same time DIP plants came on-line, the world demand for pulp slumped. Also demand projections for recycled content paper products were overly optimistic. In the end, many DIP mills couldn't make pulp of sufficient quality from sorted office paper. The combination of low pulp prices and weak demand forced mills to sell pulp at a discount in order to retain customers, thus assuring that they couldn't make a profit. The end result was more deinked capacity brought on-line than was needed.<sup>15</sup>

Contamination also poses barriers to successful production of DIP. An industry analysis of 41 bales of sorted office paper at one mill showed that more than one-third of the bales exceeded allowable levels of prohibited materials.<sup>16</sup> The best way for end users to avoid such contamination is to increase quality control measures, either by implementing inventory control (e.g., tagging bales with generator codes) or sorting on-site. Educating generators and processors on what constitutes contamination is also an important step.

Another factor influencing the DIP industry is the price of virgin bleached kraft market pulp. The downfall in prices for virgin market pulp in early 1996, fueled by expansion in virgin market pulp production, posed a barrier to increasing demand for office papers. Virgin market pulp is used to produce fine printing and writing papers and tissue (the primary markets for recovered office paper) ensuring competition between the two. See Figure 4 for an example of price fluctuations during a six-month period.<sup>17</sup>

Post-consumer DIP has no significant quality advantages (in terms of strength, brightness, or printability) over virgin pulps, and DIP is typically less expensive than virgin market pulp. When the price for virgin bleached kraft market pulp fell below that of DIP, as it did during the first quarter and most of the second quarter of 1996, some paper producers using DIP for a portion of their feedstock switched to virgin pulp. Low virgin market pulp prices will continue to pose barriers to increasing demand for recovered office papers.

State and federal level purchasing preferences also impact demand for sorted office paper. In North Carolina, Executive Order (EO) 8 directs state agencies to purchase and use recycled paper for all letterhead stationery, reports, memoranda, and other documents when feasible and practicable. At the federal level, Executive Order 12873 establishes procurement standards for printing and writing papers, specifying that certain grades of paper contain 30 percent post-consumer content by December 31, 1998, up from an initial level of 20 percent. In 1997, 28 brands of copier paper were available in North America that met or exceeded the 20 percent standard. Recent analysis has shown that compliance with EO 12873 is rising. Although many federal agencies are still buying primarily virgin paper, the



General Services Administration decided in March 1998 to exhaust its supplies of virgin copier paper and sell only recycled.<sup>18</sup>

Demand for SOP is expected to improve in 1998, especially if the pulp market improves as projected. DIP capacity is projected to continue to increase to 1.95 million tons in 1998 and remain level through 2000.<sup>19</sup> This projection may overestimate capacity somewhat, as it may include projections for DIP mills that have since ceased operating. Higher operating rates at DIP mills will likely result in higher consumption of SOP and related grades (such as computer printout and sorted white ledger).

Tissue mills are also expected to increase mill capacity this year. Of all paper grades, uncoated free-sheet and tissue  $\frac{3}{4}$  both of which are markets for SOP  $\frac{3}{4}$  are predicted to show the biggest jumps in capacity during the next three years, growing at average annual rates of 3.3 percent and 2.6 percent, respectively.<sup>20</sup>

Consumption of SOP by end users in Mexico has been increasing as a result of growing capacity and production during the past three years. Production in Mexico was up in each of the past three years, peaking at 3.2 million metric tons in 1996. Almost 80 percent of the fiber used in paper and paperboard manufacture came from recovered paper, and almost half of that came from the United States.<sup>21</sup>

### **End Users in North Carolina and Surrounding States**

The following mills in North Carolina consume sorted office paper:<sup>22</sup>

- **Cascades Industries, Inc., Rockingham, North Carolina.** Products: tissue and toweling, jumbo rolls, roll toilet tissue, boxed facial tissue. Production: 69 tons daily. Tissue capacity: 25,000

tpy. Feedstock: high-grade deinking, mixed paper, pulp substitutes.

- **Laurel Hill Paper Co., Cordova, North Carolina.** Products: facial tissues and toweling. Production: 30-50 tons daily. Tissue capacity: 15,000 tpy. Est. deinking capacity: 18,000 tpy. Feedstock: high-grade deinking.

The following tissue mills in the Southeast region consume SOP:

- **Fort James Corp., Rincon, Georgia**
- **Kimberly-Clark Corp., Loudon, Tennessee**

The following P&W paper mills in the Southeast region consume SOP:

- **Boise Cascade, Jackson, Alabama**
- **International Paper, Selma, Alabama**
- **Union Camp Corp., Franklin, Virginia**

In addition, several DIP mills and tissue, P&W paper, and paperboard mills in the Southeast accept office paper along with mixed paper.

### **SUPPLY / DEMAND RELATIONSHIP**

The office grade market, along with a host of deinking grades such as sorted white ledger, has seen up and down movement as the industry tries to determine the viability of the grade. Throughout this process, sorted office paper has been one of the few to be deemed viable, and at least one major end user sees steady domestic demand during the next several quarters.<sup>23</sup>

It is difficult to quantify the gap between deinking capacity growth and office paper recovery growth, because current estimates of office paper recovery in the United States are

limited. However, the difficulty experienced by DIP mills in obtaining new supplies of recovered office paper suggests that growth in demand has exceeded growth in supply. If this is the case, supplies of office paper may not be adequate to meet both existing and projected demand, causing market instability and possibly production slowdowns at DIP mills due to recovered paper shortages.

### **Price History**

Figure 6 illustrates a three-year price history for baled mixed office paper in the Southeast.<sup>24</sup> These prices follow the same trend as SOP but tend to be lower. Following the trend of most paper grades in this period, mixed office paper prices spiked in late 1994 and early 1995 and significantly declined in late 1995. Prices seem to have leveled to about \$50/ton since that time.

## **RECOMMENDATIONS**

Recovery in North Carolina is below the national average and could be increased using the following approaches:

- Assist local governments in working with building managers to facilitate office paper recycling. Through North Carolina Division of Pollution Prevention and Environmental Assistance (DPPEA), this effort could be as simple as generating a fact sheet about how private businesses, haulers, and recycling coordinators can work with building managers to set up office paper recycling programs. Or a more active role could involve assisting local government recycling coordinators in fostering alliances with local chapters of the Building Owners and Managers Association (BOMA). Through these alliances, BOMA members could be educated about how office paper recycling programs can reduce disposal costs and increase paper recovery.
- Assist local governments in revitalizing existing office paper recovery programs. This goal is as important as establishing new office paper recovery programs. The National Office Paper Recycling Project (NOPRP) is presently focusing on revitalizing existing programs with materials such as a

recycling guide for building managers. The state should distribute some of the NOPRP's materials to assist local governments working with the commercial sector and businesses.

- Encourage the creation of mixed commercial paper routes. Such routes could focus on a mix of office paper and old corrugated containers and would need to be organized to obtain the density to justify collection costs. Local governments could partner with large and small businesses to implement or expand public / private recovery of office paper.
- Educate generators about the need for sorted, contaminant-free office paper. This kind of communication down the line to generators could help mills improve the quality and quantity of paper they require.

Demand seems to be stabilizing; nevertheless, North Carolina could support stabilized long-term demand in the following ways:

- Increase state efforts to purchase recycled papers. It is difficult to counter the negative impact of depressed virgin market pulp prices on demand for recovered office paper. However, if demand remains strong for recycled office papers, paper manufacturers will be less likely to abandon deinked market pulp in favor of less expensive virgin pulp. The state could consider taking a more aggressive approach to recycled paper procurement, such as providing price preferences or adopting the same guidelines as outlined in the Federal Executive Order.
- Promote membership in the North Carolina Buy Recycled Business Alliance (BRBA) and promote recycled paper procurement by the private sector. The State could provide information about recovered papers, including cost and performance data, to local governments working with the commercial sector and businesses.

- <sup>1</sup> Sorted office paper consists of baled paper, as typically generated by offices, containing primarily white and colored ground-wood free paper, free of unbleached fiber. May include a small percentage of groundwood computer printout and facsimile paper. Institute of Scrap Recycling Industries, Inc. "Guidelines for Paper Stock: PS-98 Domestic Transactions." *Scrap Specifications Circular 1998*. p. 36.
- <sup>2</sup> Efforts have been made to account for these grades of papers in other sections of this report.
- <sup>3</sup> U.S. EPA. *Characterization of Municipal Solid Waste in the U.S.: 1997 Update*. May 1998. The 2002 projection assumes no change in the per capita generation rate, which is consistent with the general trends reported by EPA.
- <sup>4</sup> The following states are included in the southeast region: AL, FL, GA, KY, MS, NC, SC, TN, VA, and WV.
- <sup>5</sup> This projection assumes no change in the per capita generation rate.
- <sup>6</sup> U.S. EPA. *Characterization of Municipal Solid Waste in the U.S.: 1997 Update*. May 1998. p. 105.
- <sup>7</sup> Miller Freeman Inc. "Wastepaper markets to strengthen in 1998 despite persistent lull in offshore exports." *Paper Recycler*. Vol. 9, No. 1. January 1998. p. 7.
- <sup>8</sup> Office paper is a subcategory of the paper industry's P&W paper category, which also includes book and magazine paper, junk mail, and brochures. Office paper is the most commonly recycled portion of P&W paper.
- <sup>9</sup> Iannazzi, Fred and Strauss, Richard. "Recovered office paper: the good news and the bad news." *Resource Recycling*. Vol. XIII, No. 11. November 1994.
- <sup>10</sup> Outthrows are papers that don't meet office paper specifications and can include newsprint, magazines, catalogs, books, groundwood computer printout, manila envelopes, file folders, file stock and foil laminated stock.
- <sup>11</sup> Powell, Jerry. "News flash: recovered paper prices will soon rise." *Resource Recycling*. Vol. XVI, No. 7. July 1997.
- <sup>12</sup> AF&PA. *Recovered Paper Statistical Highlights*. 1997 edition.
- <sup>13</sup> Paper Recycler. Vol. 8, No. 12. December 1997. p 6.
- <sup>14</sup> Power, Jerry. "Beaten to a pulp: can the DIP market get back on its feet?" *Resource Recycling*. Vol. XVI, No. 9. September 1997.
- <sup>15</sup> Ibid.
- <sup>16</sup> Cesar, Mary. "Office waste paper and deinking: can this marriage be saved?" *Resource Recycling*. November 1996.
- <sup>17</sup> Miller Freeman Inc. *Paper Recycler*. December 1995 - June 1996.
- <sup>18</sup> Miller Freeman Inc. "Federal purchases of recycled-content paper improve, but still short of goal." *Paper Recycler*. Vol. 8, No. 12. December 1997, p. 7.
- <sup>19</sup> Miller Freeman Inc. "Tissue producers hit on harder times." *Paper Recycler*. Vol. 8, No. 12. December 1997, p. 6.
- <sup>20</sup> Miller Freeman Inc. "Paper industry's use of recovered paper to slow considerably." *Paper Recycler*. Vol. 8, No. 12. December 1997, p.5.
- <sup>21</sup> Ibid.
- <sup>22</sup> Miller Freeman Inc. "Tissue Producers Hit On Harder Times." *Paper Recycler*. December 1997. Lockwood Post's, Pulp & Paper International.
- <sup>23</sup> Sandoval, Dan. "Paper Stock Markets: The Beat Goes On." *Recycling Today*. February 1998.
- <sup>24</sup> Waste Age's *Recycling Times*. "The Markets Page."