

Middleton Associates

WASTE PAPER RECYCLING
OPPORTUNITIES FOR GOVERNMENT ACTION

VOLUME I
SUMMARY

FINAL REPORT

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Department of Industry, Trade and Commerce
and
Department of Supply and Services

by

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This report was commissioned as part of the ongoing program of Resource and Energy Conservation through Municipal and Industrial Wastes undertaken by the Waste Management Branch of Environment Canada. The program covers all aspects of the waste problem from generation to disposal, examining the contributions of such components as petroleum based products, rubber and plastic, glass, metals paper and packaging. The intent is to develop a broad information base and to explore initiatives available to the Federal Government to encourage environmentally sound and energy conserving manufacturing and disposal practices.

The report has been reviewed by the Waste Management Branch and approved for publication. Approval does not imply that these documents necessarily represent the views and policies of Environment Canada nor will any recommendations necessarily be adopted. The intent is to present information pertinent to the problem and to generate discussion. Comments and criticism will be welcomed.

Mention of trade names or commercial products does not constitute endorsement for use.

CONTAINS
RECYCLED
DE-INKED
FIBRE



CONTIENT
DES FIBRES
DESENCRÉES
ET RECYCLÉES

ABSTRACT

This study analyzes current and expected waste paper market conditions with the objective of identifying government initiatives which could permanently increase recovery levels in Canada. Emphasis has been placed upon defining short term, practical measures which take into account the variations in market conditions for each of the major types of secondary fibre. Thus, the study's identification of government actions is based upon in-depth, grade-specific market analyses.

The final report consists of four volumes. Volume I (Summary) summarizes the study's intentions, activities and major findings. Volume II (Waste Newsprint) analyzes recent and future waste newsprint demand, generation and recovery on both a national and a regional basis. The opportunities for increased recycling in each region are identified and recommendations made regarding appropriate government actions. Volume III (Fine Paper Waste) and Volume IV (Corrugated Waste) provide similar information for fine paper waste and corrugated waste.

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1. INTRODUCTION

Over the past fifteen years, public interest in recycling has increased considerably, as separating and collecting old newspapers and other post-consumer waste paper are seen as opportunities to express environmental concern through individual commitment and action. This interest, reinforced by a shortage of disposal sites across the country, has resulted in pressure on all levels of government to support increased recovery and reuse of all kinds of waste.

The principal benefits of increased waste paper reclamation and recycling are perceived to be as follows:

- Reduced waste management costs - More extensive recovery of waste paper will mean that there is less solid waste to be collected and disposed of. Depending on other system factors, significant cost savings may accrue to the municipality or private company currently bearing disposal costs.
- Creation of new industry - Increased reclamation and reuse of waste paper results in the creation of new investment and employment opportunities. They can also provide an opportunity for volunteer groups to raise funds for community projects.
- Promotion of the conserver ethic - Separating waste paper for recycling can be an important first step for an individual learning to do more with less.
- Conservation of forest resources - Although pulpwood is a renewable resource, trees cannot be harvested beyond a maximum sustainable yield. Competing uses for forest resources (other commercial forestry, recreation and wilderness preserves) further limit the quantity of wood that can be converted to pulp.

- Conservation of energy resources - Previous studies have shown that the production of paper and paperboard from waste paper usually requires less energy than production from virgin fibres.
- Reduced pollution - Mills using waste paper do not experience the air pollution problems associated with the production of most forms of virgin pulp. Increased recycling need not result in increased amounts of water pollution providing that proper equipment is installed.

Despite these benefits, a low percentage of Canada's paper wastes has traditionally been recovered for productive reuse. Evidence of a low level of utilization is suggested by the fact that waste papers represent the largest material component (over one-third) in the urban waste stream and that only 7% of Canada's paper and board mill fibre requirements is met by using secondary fibre.

Social concerns over future energy and resource availability and over future methods of waste disposal, along with a seemingly sub-optimal current level of utilization of Canada's paper wastes combine to suggest that the government has an important role to play in encouraging a progression to higher recovery levels in Canada.

2. STUDY OBJECTIVES AND APPROACH

The development of government actions in this regard first requires an in-depth knowledge of current and expected market conditions across Canada for the various types of secondary fibre. Thus, the objectives of this study were twofold:

- (a) to undertake a detailed analysis of current and future demand and supply conditions on a regional basis,
- (b) to identify, based on the results of this analysis, opportunities for several types of government actions.

The study had two important limitations. First, consideration was not to be given to any government initiatives which would entail

significant and lasting fiscal incentives or disincentives. Second, the scope of the study was limited to analyzing the current and future possibilities for reusing waste paper as fibre. Thus, consideration has not been given to reusing secondary fibre for other purposes such as energy extraction.

Significant variations amongst the various grades of secondary fibre in terms of composition, generation, availability, collectability and possible reuses dictated that the study approach be grade specific. While forty-eight grades are currently defined for trading purposes, three major classifications were chosen for analysis - waste newsprint, fine paper wastes, and corrugated waste. Together these types of waste paper make up 65% of the paper component of the waste stream. In addition, these three types hold the greatest potential for significant increases in recovery, in both rate of recovery (i.e. percent of generation which is recovered) and absolute tonnage terms. Other grades are already extensively utilized (e.g., bleached kraft cuttings) or have so few reuse possibilities (e.g., the mixed grades) as to preclude significant increases in recovery rates over the foreseeable future.

Section 3 of this document summarizes current market conditions at a national level for each of the three major grades. Section 4 provides a summary of conditions on a regional basis. In Section 5 future market conditions are discussed. Finally, Section 6 outlines a number of opportunities for government actions and proposes several initiatives.

The complete study report consists of four volumes:

- Volume I - Summary
- Volume II - Waste Newsprint
- Volume III - Fine Paper Wastes
- Volume IV - Corrugated Waste

Where appropriate in this document, references are made to specific sections of these volumes in order to assist the reader in understanding more of the details behind some of the findings presented. The References appear with Volume and Page number(s) in bracketed form. For example, (II, 44-48) is a reference to Volume II, Pages 44 to 48. In addition, a glossary is included at the back of this document.

3. CURRENT SITUATION

3.1 Demand

Table I.1 provides data on annual waste news consumption by paper and board mills and by cellulosic insulation plants over the period 1971 to 1977. During the early seventies, paper and board mill demand dominated the waste news market in Canada. However, with a burgeoning demand for residential insulation, and the resultant opening of a large number of new cellulosic insulation plants across the country, the basic structure of this market had changed considerably by year end 1977. Purchases by insulation plants exceeded paper mill purchases, and overall demand for waste news reached an unprecedented level of 212,000 tons per annum (tpa).

TABLE I.1

NATIONAL WASTE NEWS CONSUMPTION*

(UNIT = 1000 TONS)

<u>Industry</u>	<u>Year</u>						
	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Paper and Board Mills	107	121	130	92	73	89	101
Cellulosic Insulation Plants	17	20	24	24	31	45	111
Total	124	141	154	116	104	134	212

*Includes newsblanks and overissue.

Table I.2 provides similar data for fine paper waste consumption by Canadian paper and board mills. Separate estimates are shown for whites (hard and soft) and printed ledgers, which are the two principal forms of fine paper wastes. The 26,000 ton increase in consumption of these grades over 1977 occurred primarily because of additional deinking capacity being installed in the Ontario-Quebec region and should be taken as an indication of a permanent rise in the level of printed ledger waste demand in Canada.

TABLE I.2

NATIONAL CONSUMPTION OF

WHITES AND LEDGERS

(UNIT = 1000 TONS)

<u>Grade</u>	<u>Year</u>						
	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Whites	39.2	27.1	28.5	N/A	N/A	28.0	N/A
White Ledger	8.2	7.6	7.1	N/A	N/A	19.3	N/A
Col'd Ledger	23.6	20.9	38.5	N/A	N/A	23.3	N/A
Total	71.0	55.7	74.2	46.3	55.8	70.6	96.2

Note: Totals may not agree due to rounding.

SOURCE: (III,7)

Table I.3 displays corrugated waste consumption data. Two major grades comprise this paper waste category - new corrugated waste (clippings and cuttings from box conversion plants) and old corrugated containers. More corrugated waste is consumed than any other grade of waste paper. Since 1975, yearly demand for old corrugated containers has increased sharply, rising by nearly 56% or 200,000 tons. This has been mainly due to the installation of new mill capacity for producing recycled linerboard.

TABLE I.3

NATIONAL CONSUMPTION OF

CORRUGATED WASTE

(UNIT = 1000 TONS)

<u>Grade</u>	<u>Year</u>						
	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
New Corrugated Waste	91.3	117.5	141.9	124.6	104.2	134.3	155.5
Old Corrugated Containers	<u>240.2</u>	<u>296.7</u>	<u>247.6</u>	<u>330.5</u>	<u>256.2</u>	<u>343.0</u>	<u>403.8</u>
Total	331.5	414.2	389.5	455.1	360.4	477.3	559.3

SOURCE: (III,4)

3.2 Generation

Using 1976 as the base year for calculation, estimates were developed for the generation of the three major grades of interest and are shown in Table I.4. For waste news,

separate estimates were also made of the amounts of waste newsprint generated in the conversion sector (blanks and overissue wastes from newspaper companies and commercial printer newsprint wastes), old newspapers and old newsprint products other than newspapers, such as advertising flyers, paperbacks and telephone books, and catalogues. For the whites and ledger wastes, separate estimates were developed for those generated in paper converter, publishing and printing establishments versus those generated in office buildings within the major urban centres across Canada. Finally, the total estimate of corrugated waste generation is divided into new or conversion sector wastes versus old container generation. Old container generation is further broken down according to the amounts generated within Canada's manufacturing and trade (including wholesale and retail establishments) sectors.

3.3 Recovery

Table I.5 matches 1976 demand and generation estimates, along with import and export estimates, to yield national recovery rates for the various waste paper classifications.

The rapid increase in waste news demand over 1976 was met to a substantial degree by importing from the U.S. Demand did reach a level which could have supported a recovery rate as high as 17% for this form of waste paper had no imports been available. Although not shown, the 212,000 tons of waste news consumption in 1977 led to a national recovery rate of between 18% and 22%. However, old newspaper imports were even larger in that year and thus kept the national recovery rate from reaching a higher level of about 27% (II, 17-22).

A substantial portion of the whites and ledgers generated in the fine paper conversion sector is already recovered, as shown in Table I.5. Even greater quantities of printed ledger wastes from this sector are likely finding their way into reuse within certain mixed grades. Yet, a significant amount of printed ledgers may be generated in many commercial printing establishments yet not reclaimed as a ledger grade.

TABLE I.4

NATIONAL WASTE PAPER GENERATION

(UNIT = 1000 TONS)

YEAR = 1976

<u>Waste Paper Type</u>	<u>Generation</u>
Waste Newsprint (Total)	994.8
- Conversion Sector	82.5
- Old Newspapers	675.6
- Other Old Newsprint	236.7
Whites and Ledgers (Total)	189.8-210.6
- Conversion Sector	52.1-72.9
- Office Bldgs.* (excl. CPO)	99.4
- Office Bldgs. (CPO only)	38.3
Corrugated Waste (Total)	1,235.1
- Conversion Sector	118.4
- Old Corr. Containers (Total)	1,116.7
Manufacturing Sector	393.0
Trade Sector	723.7

*Within major urban areas only.

SOURCE: (II,11) (III,17-23) (IV,7-9,App. A)

TABLE I.5

NATIONAL RECOVERY RATES FOR WASTE NEWS, WHITES AND

LEDGERS, AND CORRUGATED WASTE

(UNIT = 1000 TONS)

YEAR = 1976

<u>Grade</u>	<u>Generation</u>	<u>Net Imports</u>	<u>Total Domestic Consumption</u>	<u>Recovery Rate</u>
Waste News*	758.1	24 - 38	134	12.7 - 14.5%
Whites and Ledgers (Total)	189.8 - 210.6	23.7	70.6	21 - 30%
- Conversion Sector	52.1 - 72.9	-	27.4 - 34.4	38 - 66%
- Office Bldgs. (Excl. CPO)	99.4	-	1 - 3	1 - 3%
- Office Bldgs. (only CPO)	38.3	-	15 - 20	39 - 52%
Corrugated Waste (Total)	1,235.1			
- Conversion Sector	118.4	21.9	134.3	95%
- Old Corr. Containers	1,116.7	97.7	343.0	22%

*Excludes old newsprint products other than newspapers (II,12).

The bulk of Canada's available (i.e. generated but not recovered) ledger waste currently resides in office buildings.

Whites and printed ledger imports in 1978 and 1979 are expected to surpass 40,000 tpa, a level of import reliance which is significantly higher than the 23,700 tpa 1976 figure. Recent deinking mill expansions, for a number of reasons, have turned to U.S. ledger wastes rather than the ledgers not currently being reclaimed from small commercial printers and office buildings in Canada.

Some 95% of the corrugated waste generated in Canada's box plants is currently reclaimed for recycling purposes. On the other hand, about 22% of Canada's total old corrugated container generation was recovered in 1976. Nearly 100,000 tons of old corrugated box imports offset the need to acquire some 30% of Canada's total old corrugated container waste.

4. REGIONAL CONDITIONS

4.1 Atlantic Canada

Although demand for waste news in Atlantic Canada has traditionally represented less than 10% of the waste news generated in this region, recent openings of cellulosic insulation plants are currently creating a dramatic increase in local demand. In fact, total waste news consumption in this region is expected to reach nearly 10,000 tpa this year or next. This level is slightly greater than the total amount of waste news considered potentially recoverable from the major urban areas of Atlantic Canada (II, 60-62).

Regional demand for whites and ledgers is, however, minimal.

Old corrugated container usage within the region's boxboard and moulded pulp production plants currently permits the reclamation of between 10% and 15% of the region's total generation.

4.2 Ontario-Quebec

The Ontario-Quebec market has undergone several significant changes over the last few years.

First, waste news demand in this region rose from about 70,000 tpa in 1975 to nearly 130,000 tpa in 1977. This level of demand could have supported a regional recovery rate of nearly 25%, but , a significant amount of imported waste news reduced the actual recovery level achieved. Between 35-40% of this region's waste news market is currently created by cellulosic insulation production (II, 68).

Second, deinking expansions in Quebec have resulted in a growing reliance on imported printed ledgers from the U.S. Imports of whites and ledgers into this region may reach 40,000 tpa by year end 1978.

Third, additional expansions in recycled linerboard production in Ontario have increased regional demand for corrugated waste considerably. Over 1977, some 45,000 additional tons of corrugated waste was needed in Ontario alone. A considerable level of corrugated waste imports already existed in this region in 1976. Coupled with the fact that old corrugated recovery rates of 35% to 40% and 30% to 35% had at that time been reached within the major urban areas of Quebec and Ontario, the recent expansion in corrugated waste requirements has resulted in growing pressure to either recover more old corrugated locally or to increase imports further. In fact, recovery rates of over 45% would currently be required within this region's urban areas to significantly reduce current corrugated waste import levels (II, 7-15).

4.3 The Prairies

The Prairies waste news market is distinctly different from other regions in Canada. Cellulosic insulation production in this area has significantly exceeded levels of production elsewhere in the country. In 1977 it was greater than the production rates in Ontario and Quebec combined. Well over 75% of the current waste news used in the Prairie region is presently processed into cellulosic insulation. Demand has been exceptionally high relative to local waste

news availability. Recovery rates of 50% have been attained in certain urban areas; yet a large amount of importing has still been required (II, 19 and 76-77).

On the other hand, regional demand for whites and printed ledgers is minimal.

The urban centres in the Prairie region exhibit the lowest recovery levels for old corrugated containers in Canada, owing principally to a relatively low regional demand for this waste. For example, reclamation in the city of Winnipeg in 1976 represented only 17% of local generation. Recovery rates of about 19% were achieved in Edmonton and Calgary (IV, 11).

4.4 British Columbia

Market conditions in British Columbia indicate that increases in cellulosic insulation production in that region may soon offer an opportunity to recover nearly all of the province's potentially recoverable waste news (II, 82). In addition, the off-shore market for waste news strengthened considerably over 1977.

A sizeable local demand for printed ledgers exists here but is readily met, for the most part, by local conversion sector generation. However, the Far East market also appears to provide a sizeable outlet for quality ledger grades.

A combination of a considerable regional and a growing off-shore old corrugated container demand has likely raised recovery rates for this grade in the major urban areas of B.C. above the 35% rate which was attained in 1976 (IV, 11).

5. FUTURE CONDITIONS

5.1 Waste News

Despite the boost cellulosic insulation production has given waste news recovery in the last two years, the limitations

of the residential retrofit market and plant expansions by mineral wool insulation producers will result in a constant decline in waste news demand through to the mid-eighties unless new markets develop. Figure I.1 graphs expected overall waste news consumption and consumption within paper and board mills and within cellulosic insulation plants. Due to some uncertainty over the future operations of certain existing boxboard producers, two future growths in paper and board mill waste news consumption are illustrated. The lesser growth rate (1.5% per annum) reflects this uncertainty.

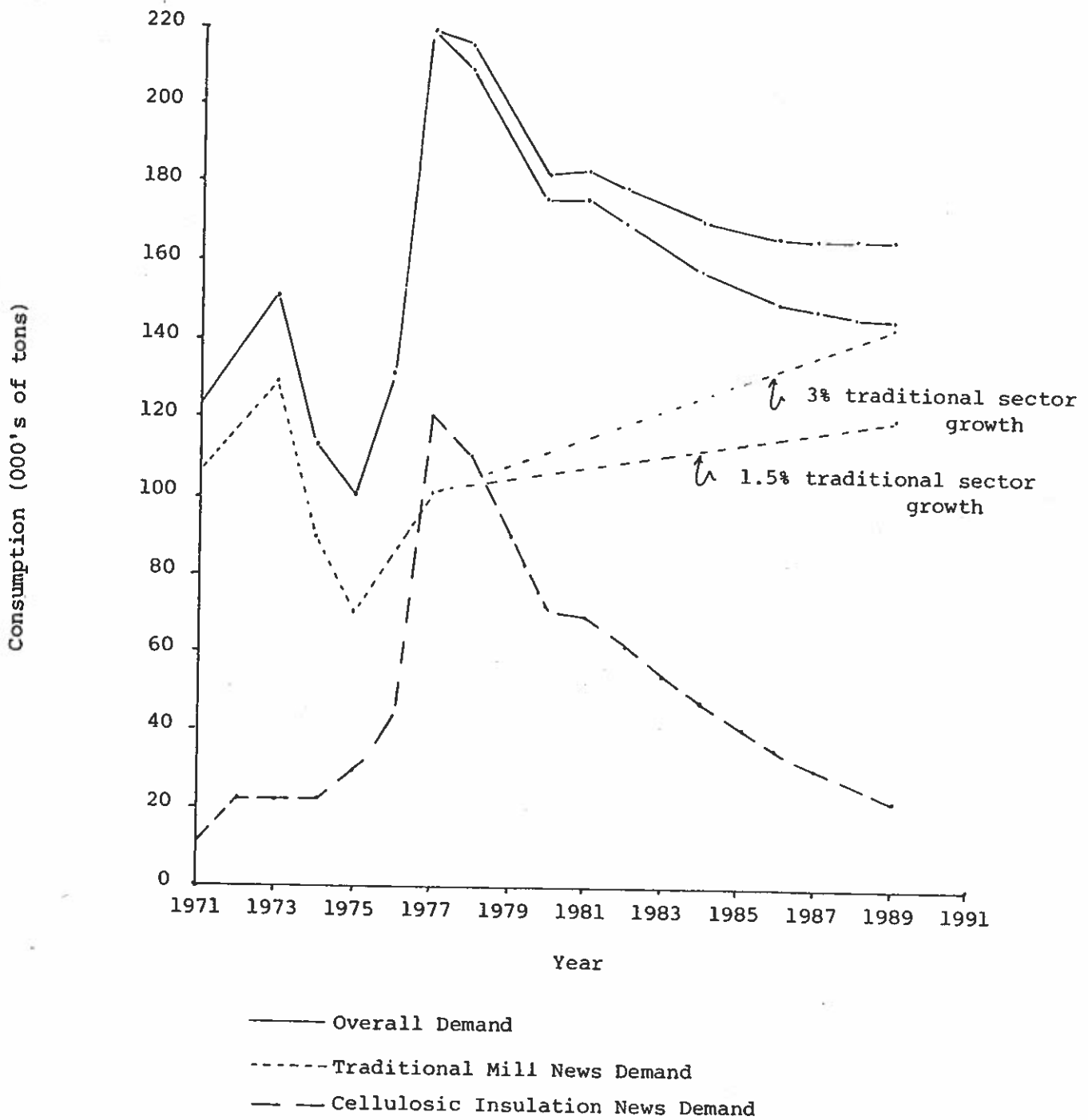
Barring the development of additional outlets for waste news the maximum (i.e. no imports) attainable recovery rate in Canada will be about 17% in 1985. Allowing for expected increases in waste news generation, the creation of over 70,000 tons of annual demand will be needed by 1985 to sustain the national recovery rates recently achieved. In order to achieve a higher national recovery rate of 40%, about 230,000 tons of additional annual demand will have to be created (II, 23-28).

Several possibilities exist for new market development. These are:

- (a) the use of waste news as a spray-on insulation material for commercial and industrial applications,
- (b) the use of shredded newsprint as an animal bedding,
- (c) the use of waste news as a material for treating municipal sewage sludge before incineration,
- (d) the use of cellulosic insulation in existing and/or newly constructed walls,
- (e) the use of deinked waste news as a complete or partial newsprint furnish component,
- (f) the use of undeinked waste news as a partial newsprint furnish component.

FIGURE I-I

FUTURE WASTE NEWS DEMAND - BASE SCENARIO



SOURCE: (II, 28)

The most promising of these possibilities appears to be (e). Rising pulpwood and energy prices, along with escalating capital requirements for traditional groundwood and semi-chemical pulping facilities have sharply increased the economic attractiveness of waste news deinking for newsprint production (II, 72-73). More importantly, the unexpected surge in newsprint consumption in the U.S. over the last year has Canadian producers operating at capacity. Expansion initiatives have already begun.

Future supply capabilities in the Ontario-Quebec region and the northeastern U.S. indicate that availability should be sufficient to support one or perhaps two waste news deinking installations in this part of Canada (II,71). Furthermore, there is considerable evidence to support the assertion that the economics of increased waste news collection are well matched to those required to make a deinking investment attractive (II, 48-59, 73).

The magnitude of demand which would be created by one or two deinking installations and the expected demand level for other existing waste news uses in the Ontario-Quebec region would provide an opportunity for achieving this region's maximum potential recovery rate.

Waste news supply capabilities and/or a lack of accessible resident virgin newsprint production capacity indicate that domestic waste news deinking has no role to play in increasing recovery levels elsewhere in Canada. However, supply capabilities are sufficient to support the use of undeinked waste news in newsprint production in these other areas, with the exception of Alberta and Saskatchewan (II, 64-67, 79-81, 83-84). Barring the installation of sizeable deinking capacity in either Ontario or Quebec, a number of southern Quebec newsprint mills could significantly raise regional recovery levels by adopting the practice of utilizing undeinked waste news to make up between 2% to 5% of their newsprint furnishes (II,73-75).

Although a great deal is as yet unknown about the feasibility of a shredded newsprint animal bedding, the sheer magnitude of current cattle bedding usage suggests that minimal market penetration of such a product could produce substantial

increases in recovery rates all across Canada. This is particularly true for the Prairie region where a 3% share of cattle bedding usage in the three provinces would create nearly 30,000 tons of new waste news demand each year. If attained, this size of new market would be great enough to support over the future the high recovery levels which already have been attained in this region (II, 76-81).

For several reasons, the other possible new uses for waste news are not as attractive at this time as the three discussed above. The principal limitation is that each offers the potential for a relatively small market, or an episodic market, or both.

5.2 Whites and Ledgers

The future potential for increased ledger waste recovery from commercial printing establishments and office buildings in Canada involves several factors.

To date, dealers and paper mills have been reluctant to initiate or encourage new recovery programs involving small commercial printers or office employees. There are a number of reasons for this reluctance. For instance, these sources present a range of uncertainties over program set-up costs, source separation education procedures, attainable volumes and, perhaps most important of all, contamination levels (III, 64-68).

However, the need for industry members to adopt a more aggressive stance in terms of developing additional domestic ledger waste recovery capabilities has to a large extent been mitigated by the availability of U.S. ledger and white imports. Any significant reductions in this availability could have dramatic effects on industry interest and support for additional domestic ledger recovery efforts. For instance, expected whites and ledger import levels in 1978-79 in the Ontario-Quebec region will represent over 50% of the quantity of ledgers potentially recoverable at current ledger price levels from office buildings in this area (III, 72-73). Thus, import availability will play a key role in determining the extent to which additional fine paper waste

recycling in Canada will progress.

Deinking expansions in the State of Washington, the East North Central states and New York State over the next two years should begin to increase the competition for the ledger wastes currently available to Canadian mills. Over the longer term, the rate of deinking capacity installation in the Northern U.S. may be increased significantly if the U.S. product charge legislation presently under consideration is enacted.* Even without this indirect incentive for installing deinking rather than virgin fibre pulping systems, the economic advantages of tissue and fine paper deinking have been established for some time. Rising energy and wood prices will continually enhance the manufacturing cost advantages deinking offers.

Thus, expansions in U.S. deinking operations will continue where availability permits and will likely have a pronounced effect on demand for the ledger wastes currently available to Canadian mills.

As noted previously, current demand for whites and ledgers within the Prairies and Atlantic Canada is relatively low and is readily supported through reclamation from paper converting establishments. Nonetheless, demand for source separated ledgers provided from commercial printing establishments and office buildings in these two regions could increase over the future. First, deinking expansions in the East North Central U.S. could draw upon quality ledger made available in Manitoba. Second, a reduction in the future availability of imported ledger to Ontario and Quebec mills could result not only in an increased demand for locally generated printer and office fine paper wastes but also in an increased demand for similar wastes from Manitoba and the Atlantic provinces. Transportation costs will, of course, tend to work against this possibility, although ledger waste prices allow for significantly greater transportation costs than the prices for the other bulk grades such as waste news and old corrugated. The key to enabling

* This legislation would result in the imposition of a \$30 waste disposal tax on each ton of virgin pulp processed in the U.S.

the hauling of fine paper wastes from these areas to deinking markets will be the quality of the ledger waste recovered. This consideration applies equally to future fine paper waste recovery efforts in Alberta. Increasing demand for deinking ledger grades within the Pacific Northwest region and in the Far East could serve as an outlet for a quality ledger waste recovered from printers and office buildings in Alberta.

There is one other possibility which might create more local demand for printed ledgers within the Prairies and Atlantic Canada. Some industry development effort is being directed towards the substitution of ledger waste for higher priced hard and soft whites within boxboard and tissue mills (III, 37-38). Some boxboard mills which may be able to adopt such a practice are located within the Prairie and Atlantic regions.

5.3 Corrugated Waste

The future prospects for increased old corrugated container recovery are similar in some ways to the prospects for increased ledger waste reclamation. The availability of corrugated waste imported from the U.S. has to date offset the need to extend recovery efforts in local retail and manufacturing establishments within British Columbia, Ontario and Quebec. Reductions in U.S. corrugated waste availability and the price increases which would accompany these reductions would significantly raise the potential for more old corrugated container recycling in these provinces. In addition, these reductions could also result in higher reclamation levels in those parts of Canada which currently have very low recovery rates owing to limited local needs (i.e. the Prairies and Atlantic Canada). However, unlike ledger wastes, distance to market and resulting transportation costs are major constraints to increased corrugated waste reclamation in the Prairie and Atlantic regions.*

The current trend towards increased corrugated waste usage by U.S. linerboard mills could result in significant

* This conclusion is largely based upon the assumption that if recovery rates of 35-40% are achievable in major urban areas where a strong, regional demand for corrugated waste exists, similar rates can be attained elsewhere if the limitations imposed by distance to market are removed.

reductions in the availability of this waste in the northern U.S. by the early and mid-eighties. In fact, the potential new demand for this waste would necessitate unprecedented recovery levels within the north-eastern U.S. and elsewhere (IV, 16-19). In addition, the U.S. product charge legislation previously noted, if enacted, is expected by many to have a pronounced effect on the demand for corrugated waste. Thus, competition for the U.S. corrugated waste currently available to Canadian mills is expected to continually intensify over the future.

6. OPPORTUNITIES FOR GOVERNMENT ACTIONS

The findings of this study suggest a number of opportunities for government initiatives which will assist in a progression to higher waste paper recycling levels in Canada.

6.1 Waste News

The waste news market is in a predicament at this moment. Recently attained demand levels and resulting import rates suggest that encouragement and support for additional collection efforts are required. However, without the development of additional waste news markets, excess supply situations are expected to occur at various times within the near future across Canada (II, 60-85). At the same time, newsprint producers across the country are now operating at capacity levels. This situation dramatically improves the possibilities for deinking investments and/or extended uses of undeinked waste news in Canadian newsprint production. The government can play an important role in both stimulating the *timely* development of additional waste news demand and assisting in a smooth transition from current market conditions.*

Thus, the following government actions are recommended:

- encourage deinking investment in Ontario and Quebec
- investigate and encourage the use of undeinked waste news in newsprint production

* It is felt that a collapse of existing waste news collection programs due to the expected decline in cellulosic insulation demand could jeopardize future supply capabilities (II, 89).

- support efforts to supply Foreign Markets
- support the development of a program to ensure that the use of shredded newsprint for animal bedding is not a health hazard (II, 90-93)
- support stocking arrangements in order to maintain collection programs until new demand materializes (II, 94)
- sponsor research into collection systems (II, 95)
- encourage and support collection programs (II, 96).

6.2 Whites and Ledgers

As indicated earlier, the future need for new ledger recovery capabilities involving small commercial printers and office source separation programs in many parts of the country rests with the future availability of U.S. whites and ledgers.

With the real possibility of reduced import availability in mind, the following government actions are recommended:

- promote additional recovery from conversion establishments (II, 80-81)
- promote recovery in office buildings (II, 81-82)

- establish a contaminant control program (II, 82-84).

Four other actions which would raise printed ledger demand in various parts of the country are available to the government for consideration (II, 85-86). However, given that the major constraints to additional printed ledger recovery will be supply related, the actions listed above should receive primary consideration.

6.3 Corrugated Waste

Domestic demand for corrugated waste is expected to continue at a level which could theoretically absorb close to 40% of Canada's total old corrugated container generation. The attainment of a 40% national recovery rate would likely be achieved by recovering about 50% of the old corrugated waste presently generated in twenty-three major urban centres across Canada . But, as previously noted, the need to reach these remarkably higher levels of recovery (which are close to twice the 1976 levels) has to date been offset by large imports of U.S. corrugated waste. However, the relief these imports have provided may be temporary given expectations of increases in corrugated waste usage within American mills.

Increasing needs for more domestically reclaimed old corrugated containers can likely be met to a significant extent within the near future through additional source separation techniques, which will not necessitate substantial corrugated waste price increases. The most interesting new supply source possibility is Canadian shopping malls. Over 132,000 tons of old corrugated containers are currently generated each year in these malls. Given old corrugated container imports will likely top 100,000 tons in 1978, recovery programs in Canadian malls could play an important role in relieving some of the supply problems which may be created over the future as a result of reductions in import availability (II, 19-24).

There are basically two programs which the government could adopt to increase domestic corrugated waste recovery. These are:

- the improvement of local recovery capabilities in British Columbia, Ontario and Quebec
- the reduction of freight costs for moving old corrugated waste from low recovery areas, such as Alberta, Manitoba and New Brunswick to areas of high demand such as British Columbia, Ontario and Quebec.

Thus, the following government actions are recommended:

- promote recovery from shopping malls and smaller manufacturing plants
- obtain endorsement and support for such efforts from current corrugated waste users
- reduce transportation costs for corrugated waste moving from the Prairie and Atlantic regions through either promoting back-haul arrangements or lowering freight rates (III, 25-28).

GLOSSARY

- Bleached kraft cuttings - a high quality, ink-free conversion sector waste containing strong, bleached fibres produced using sulphate (kraft) pulping.
- Converting establishments - locations where paper and board products are cut, trimmed, printed or otherwise processed after mill production and before purchase by end-user.
- Corrugated waste - a board waste containing bleached or unbleached kraft fibres. Usually available as a combination of linerboard and corrugated medium which is the fluting material used between layers of linerboard. New corrugated waste refers to cuts and clippings from manufacturing corrugated containers. Old corrugated waste refers to containers, with or without a medium, which are made using bleached or unbleached kraft fibres, and which are ready for discard into the waste stream.
- CPO - short form used to refer to computer print out paper. As is currently used within the paper industry, includes only non-groundwood print out.
- Groundwood pulping - a mechanical process which reduces wood to a low strength pulp by pressing on a revolving grindstone.
- Ledger wastes - unprinted or partially printed printing and writing papers containing at least 50% bleached chemical fibres. May be white or coloured.
- Mixed grades - heterogeneous combinations of waste papers. Can include combinations of corrugated waste, waste news, printed printing and writing papers, and other forms of waste paper.

Semi-chemical pulping - a process in which woodchips are partially softened under steam pressure with chemicals and reduced to pulp by mechanical action.

Waste news - various forms of waste newsprint including printed or blank waste newsprint originating from newspaper companies and commercial printers as well as daily and weekly newspapers ready for discard into the waste stream. As used in this study, the term *excludes* other post-consumer products made partially or entirely from newsprint papers (e.g., advertising flyers, telephone books and catalogues).

Waste news deinking - a process in which waste news is pulped, cleaned and chemically treated to remove ink.

Whites (hard and soft) - a high quality conversion sector waste, free of inks or coatings and containing bleached chemical fibres.