ANNUAL REPORT OF THE

VIRGINIA RECYCLING MARKETS DEVELOPMENT COUNCIL

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 92

COMMONWEALTH OF VIRGINIA
RICHMOND
1998

1997 RECYCLING MARKETS DEVELOPMENT ADVISORY COUNCIL

APPOINTEES	REPRESENTING
Mike Dobson Waste Management of Virginia	Solid Waste Collection Industry Chairman, VRMDC
Michael Benedetto Tidewater Fibre Corporation	Paper Industry
Betty H. Boswell Owens Brockway Glass	Glass Industry
John M. Carlock Hampton Rhodes Planning District Commission	Urban Planning Districts
Andrew Carrington Carrington Company	Citizen Member
Edward A. Duffy, Ph.D. AlliedSignal, Polymers Division	Plastics Industry
Diane Jones Stafford County Litter Prevention & Recycling Coordinator	Rural Planning Districts
Robert Kerlinger Innovative Environmental Systems	Organic Waste Industry
Richard M. Lerner Cycle Systems	Scrap Metal Industry
John Mitchell Central Virginia Waste Management Authority	Recycling Industry
Richard S. Weber Office of Technical Assistance, Loudoun County	VA Association of Counties
M. Terry Westhafer Central Tire of Verona	Tire Industry
Douglas C. Wine City Council, Staunton	City Government
Grady S. Wood Amoco	Oil Industry
State Agency Representatives	
Dave Greiner	Dept. of General Services
Michael P. Murphy	Dept. of Environmental Quality
William A. Lindsey	Dept. of Transportation
William Vehrs	Dept. of Business Assistance

1997 Report of
The Virginia Recycling Markets Development Council

To: The Honorable James S. Gilmore, III
and
The General Assembly of Virginia

The Virginia Recycling Markets Development Council, established by the General Assembly in 1993, is directed by statute (Section 9-145.47 Code of Virginia) to develop and monitor the implementation of a plan to strengthen Virginia's recycling infrastructure and markets by: improving the supply and quantity of recyclables available; expanding the capacity of collectors, processors and manufacturers to handle and use secondary materials; and developing strategies to increase the use of specific materials.

In carrying out the charge that the General Assembly provided to the Council, the Council is to undertake the following activities:

A. 1. Promote and coordinate state agencies' and authorities' efforts to enhance markets for recycled or recovered materials;

2. Promote the purchase of products made from recycled or recovered materials;

3. Identify and evaluate financial and other incentives which may attract new businesses that can use recycled or recovered materials generated in Virginia;

4. Identify barriers to the development of markets for recycled material including existing state policies, regulations and procedures, and recommend alternatives to overcome such obstacles;

5. Develop recommendations for the establishment of a regional or interstate marketing system for recycled materials;

6. Encourage the use of uniform recycling definitions and standards throughout the state;

7. Promote and encourage public/private market development initiatives;

8. To report annually its findings and recommendations to the Governor and the General Assembly; and

9. To determine the volume of materials by varying categories or commodities which is being recycled in the Commonwealth and to report its findings in its 1998 report. The Council shall investigate the frequency of situations in which, because of market conditions or other factors, materials collected for recycling are otherwise disposed of, and determine measurers to avoid the recurrence of such situations. The Department of Environmental Quality (DEQ) shall provide staff to the Council for the purposes of this subdivision and shall cooperate with the Council in the preparation of the report.

B. The council shall develop and monitor the implementation of a plan to strengthen Virginia's recycling infrastructure and markets which will (i) improve the supply and quantity of recyclables available, (ii) expand the capacity of collectors, processors, and manufacturers to handle and use secondary materials, and (iii) incorporate strategies to increase the use of specific materials.

1997 Activities of The Council

The Council met several times during the course of the year. Our meetings were held at the following locations:

February 13, 1997
Department of Environmental Quality
629 East Main Street
Richmond, VA 23219

August 18, 1997
Central Virginia Waste Management Authority
Interstate Center
2104 West Laburnum Avenue
Richmond, VA 23227

September 22, 1997
Central Virginia Waste Management Authority
Interstate Center
2104 West Laburnum Avenue
Richmond, VA 23227

December 9, 1997
Central Virginia Waste Management Authority
Interstate Center
2104 West Laburnum Avenue
Richmond, VA 23227

During the course of these meetings, the Council heard several presentations from individuals, state agencies, and businesses from their perspective as to the state of recycling in Virginia.

In an effort to address new legislative issues, several subcommittees were formed. These subcommittees were to address House Joint Resolution 597 and House Bill 2881/Senate Bill 1068.

HJR 597 Subcommittee

House Joint Resolution 597, agreed to by the 1996 General Assembly, directed the Virginia Department of General Services, in conjunction with the Virginia Recycling Markets Development Council, to study ways to increase the State purchase of recycled content products and to study the desirability and feasibility of setting a State goal which increases the States purchase of recycled content products by 1 percent per biennium for 5 biennia.

House Document 26 (1998) was submitted to the 1998 General Assembly (Appendix I - Recommendations)

HB 2881 Subcommittee

This legislation is directed at determining the volume of materials, by category / commodity, which is being recycled in the Commonwealth and to reporting its findings in its 1998 Annual Report. The Council was directed to investigate the frequency of situations in which, because of market conditions or other factors, materials collected for recycling are otherwise disposed of, and determine measures to avoid the recurrence of such situations.

PRESENTATIONS

The Construction Waste and Demolition Debris (C&D) Recycling Committee submitted its recommendation that the Department of Environmental Quality be given the necessary funding to do a detailed study of potential markets for the primary recyclable materials that are in C&D debris. The Department of Transportation should cooperate on this project.

Litter Control and Recycling Fund Advisory Board

Rosemary Byrne, Vice Chair of the Advisory Board, described the grant program and its requirements.

DEQ awards approximately $1.3M in non-competitive, formula-based grants to local governments to support local litter control and recycling programs. Approximately $300,000 is available for statewide or regional environmental education projects dealing with litter prevention and recycling topics. These two grant programs are funded from Virginia's "litter taxes."

MACREDO

Evadne Giananni of the Delaware Department of Economic Development explained the origin of MACREDO (Mid-Atlantic Consortium of Recycling and Economic Development Officials). Participants are Virginia, West Virginia, Washington, D.C., Delaware, and Pennsylvania. William Vehrs, Department of Business Assistance, is representing Virginia and the Recycling Markets Development Council (RMDC).

Department of Business Assistance

William Vehrs, Department of Business Assistance, reported on recruiting new business to Virginia and aiding existing companies. Virginia does not single out recycling industries for special recruitment or treatment. Mr. Vehrs reported that in the agency's contact with companies, over 80% are recycling and have a very strong recycling ethic.

A wide variety of incentive programs are available to assist existing Virginia businesses to expand operations, including:

- Work force training
- Infrastructure development and improvement
- Financing
- Tax incentive and enterprise zones
- Technical assistance and consultation
- Export market development
- Business planning and management consultation

State Agency Initiatives

1. DEQ Web Site - http://www.deq.state.va.us
2. Virginia Environmental Network
3. Directory of Virginia's Innovative Environmental Technology Businesses
4. Jobs Through Recycling Data Base
5. State Agency Materials Exchange
6. VDOT Research - Report due
7. VDOT Committee - Report due
8. DGS - Report due
9. DOE - Report due

Developing a Market Plan

Keith Parkinson addressed the Council on his efforts at the "Virginia's Philpott Manufacturing Extension Partnership" to assist businesses.

In-Vessel Composting

Robert Kerlinger introduced a product line for commercial size composting. The method creates a controlled environment with favorable levels of water and oxygen and proper temperature to expedite the composting process with complete pathogen kill.

MARKET UPDATE

STATUS OF RECYCLING IN VIRGINIA

The Virginia DEQ Recycling Report (December, 1993) noted that the majority of the 84 communities reporting, did achieve the 15% recycling rate required by the state statute. Those that did not were rural, less populated areas. Overall, 75% of the localities reported that finding markets for recyclables and staying within feasible program costs was difficult. The report reasoned that for "rural" areas, these problems were even more evident. It cited a lack of population densities and subsequent material generation rates and availability/feasibility of markets due to distance. Effective strategies for recycling in rural areas varies greatly from recycling in urban areas. Due to insufficient quantities of recyclables and fewer marketing opportunities (markets are further away), many communities across the nation have utilized cooperative or regional approaches.

In 1995 localities reported an overall recycling rate of 35%.

GLASS

NATIONAL

Despite consolidation within the glass container industry, glass recycling continues to grow. Recent estimates from the Glass Packaging Institute showed that nationally 38% of all glass containers were recycled in 1996, up from 37% in 1995. This was the eighth year in a row that glass container manufacturers increased their use of recycled materials.

In recent months, new technology has been introduced in this country that allows processors to detect ceramics and color sort post consumer glass. This is an important step forward, particularly given the growing use of commingled collection in curbside collection programs.

VIRGINIA

The cost of transportation continues to hinder recycling of glass in the Commonwealth but markets can be found within a reasonable distance from the majority of the state's population. Owens Brockway, which operates Virginia's only 2 glass container plants in Danville and Toano, set a new record with an average of 21% post-consumer glass cullet.

PLASTICS

NATIONAL

OVERVIEW - The American Plastics Council (APC) estimates that 55% (14,645) of US communities and more than 70% of the population have access to programs that collect one or more types of plastics. High Density Polyethylene (HDPE) is the most recycled plastic and Polyethylene Terephalate (PET) is next.

PET - According to the National Association for Plastic Container Recycling (NAPCOR), recycling of PET was down in 1996 as compared to 1995. In 1996, 572M pounds of PET containers were recycled corresponding to a recycling rate of 26%. This is compared to 622M pounds in 1995 and a recycling rate of 32%. According to NAPCOR, the following three factors were responsible for this decline:

1) Increased capacity of virgin PET reducing demand and price for recycled PET
2) Decline in municipal support for recycling in general
3) Changing dynamics regarding plastic soda drink bottles from 1 and 2 liter bottles to 20 oz containers which are sold thorough convenience stores and not consumed at home. No recycling system was in place to handle these smaller containers.

The APC also related the drop in PET recycling in 1996 to a decreased demand for PET fibers. Textile and carpet fiber is a major market for recycled PET.

PET recycling is expected to rebound in 1997. Due to an increasing demand for PET bottles, the demand and price for recycled PET increased in 1997, approaching historical records. Industry associations have active programs to address factors 2 and 3 above.

Dr. Melvin Druin of the Center for Processing of Plastic Packaging, estimates that the applications for recycled PET are:

Fibers	44.2%
Food Bottles	4.4%
Non-Food Bottles	9.7%
Strapping	7.1%
Sheet	7.1%
Molding Compounds	3.5%
Export	20.4%
All Other	3.5%

Carpet - There is significant activity in the area of post-consumer (p-c) carpet recycling. DuPont and Wellman have developed programs to collect, sort, and process p-c carpets with nylon 6,6 (N6,6) face fiber and recover the N6,6 as a colored resin. The end-use applications are in automotive parts where p-c content is considered desirable. Wellman is supplying p-c resin to produce the fan grill in Ford's Windstar and DuPont is supplying a p-c resin to produce the oil filter housing in Ford cars. Both received the Society of Plastics Engineers annual recycling award for these projects. It is estimated that about 6 million pounds of carpet are diverted from landfills annually due to this program.

AlliedSignal and BASF have targeted the recycling of p-c carpets with nylon 6 (N6) face fiber back to caprolactam (monomer of N6). In 1997, BASF operated a 10M pound per year depolymerization facility in Canada. In late 1997, AlliedSignal announced a manufacturing joint venture with DSM to recover 100M pounds per year of caprolactam via depolymerization. The commercial facility will be located in Augusta, Georgia and is scheduled to be operational in mid 1999. At full capacity, this process will divert over 250M pounds of carpet from landfills. This

process also reduces energy usage: approximately 5T BTUs of energy will be reduced vs. virgin production. This is enough energy to heat 100,000 average single family homes per year. Various technologies were developed and the depolymerization process was demonstrated at AlliedSignal's Technical Center in Petersburg, Virginia.

VIRGINIA

Virginia has a very active plastics recycling program. Approximately 117 Virginia communities have plastic recycling programs: 24 curbside programs; 62 drop-off programs; and 31 programs which utilize both curbside and drop-off collection. There are 20 plastics processing centers in Virginia: 6 reclaimers (processing plastics through to pellets); and 14 collectors who sort and bale.

The APC has provided marketing and technical support to the following Virginia organizations in 1997 that are involved in plastics recycling.

- **City of Newport News** - APC has provided market information to support the city's start-up plastic strapping recycling program.
- **CVWMA** - APC provided technical and funding to support CVWMA's public education program
- **City of Chesapeake** - APC provided market information and training literature to assist in a plastics recycling program from curbside litter
- **Plastics Plus** - APC provided marketing information to this start-up Richmond based company which is interested in collecting and sorting plastics from automobiles, computers, and bottles.

OIL

NATIONAL

The involvement of the oil industry in used oil is limited. Most facilities have in-house recycling recovery system. Contaminants, mainly metals, restrict the use of used oils from these systems. The metals poison the catalysts used in the refining process.

Most states have oil collection centers. Usually the state's environmental agency has a program or provides guidance on managing the used oil collected.

VIRGINIA

DEQ provides guidance documents. According to VDOT in a report to the General assembly, used oil is handled adequately at the local level except in isolated, rural communities.

PAPER

NATIONAL

Prices increased or remained the same for most major grades of paper in the first half of 1996. By the second half, demand had leveled off and prices declined steadily for the remainder of the year.

VIRGINIA

Virginia has numerous paper mills that are accepting a wide range of paper items including old newspapers, magazines, corrugated cardboard, mixed paper, and office paper. Paper mills have made substantial capital investment and appear committed to using recycled fiber.

The paper industry has committed significant resources in educating consumers especially local businesses as to the advantages of paper recycling.

CONSTRUCTION & DEMOLITION DEBRIS

VIRGINIA

There are several million tons per year of C&D waste material that is currently being landfilled in the Commonwealth. The C&D recycling committee reported that C&D is:

1. a "sleeping giant" of a byproduct of the construction and demolition waste industry which the Committee feels is currently not understood as a strategic material resource;

2. the specific availability and barriers to broader utilization of this material in the Commonwealth are not yet adequately defined;

3. the material is not being tapped to its' full potential by VDOT and general contractors around the Commonwealth due to institutional, economic, and other reasons not yet fully documented at the State level.

SCRAP METAL

NATIONAL

The scrap metal industry has enjoyed a strong demand for it's products due to the high production rate of the "mini-mills". Demand for scrap remains high but will depend on the growth in the US and Asian markets

VIRGINIA

The Commonwealth has enjoyed the same strong market as the nation but the export market has been weak. Virginia should expect continued strong demand due to the announcement of Chaparral Steel locating its new production facility in Virginia.

The Recycling Equipment tax credit has been a good incentive for scrap metal processors investing in processing equipment.

The Commonwealth has experienced a problem with finding a Virginia consumer for steel cans. Virginia based steel mills have decided not to accept this material. Therefore collected steel cans must be sent outside of Virginia for processing. The scrap metal recycling industry has continued to request that mills in the Commonwealth process this material but they have not yet agreed to do so.

TIRES

NATION

According to the Scrap Tire Management Council (STMC), which is an independent advocacy organization created by the North American tire industry, there were 266 million new scrap tires generated nationally in 1996. The national recycling rate for scrap tires is 84% (228 million tires). At this rate, recycling of scrap tires exceeds aluminum cans, steel cans, newsprint, glass bottles, and PET plastic bottles. Uses for the used tires is shown below in Figure 1. The most significant use for used tires is in Tire Derived Fuels (TDF). According to Goodyear (supplement to Scrap Tire Recovery, An analysis of Alternatives), 41 Portland Cement Kilns, 29 paper and pulp plants, and 47 Electric Generation Plants were using TDF as of March, 1998. The goal of the STMC is to create a market capacity to consume 110% of the annually generated scrap tires by the year 2002 (see Figure 2). At this time not only new scrap tires will be recycled but also those tires that are presently in stockpiles. According to the STMC there are 800 million tires currently in stock piles.

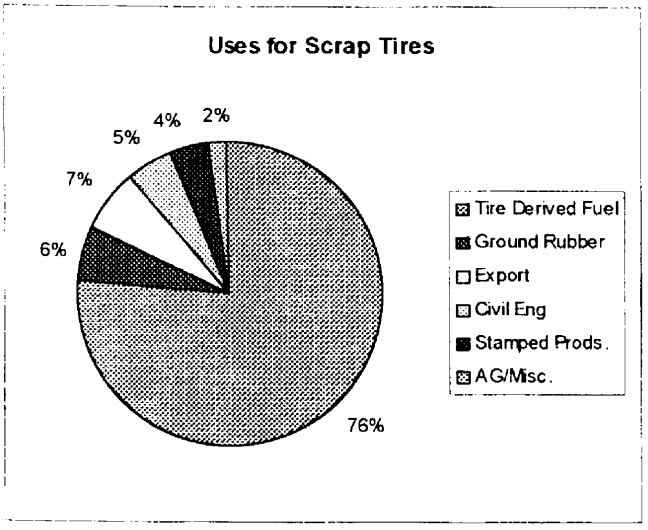

Figure 1

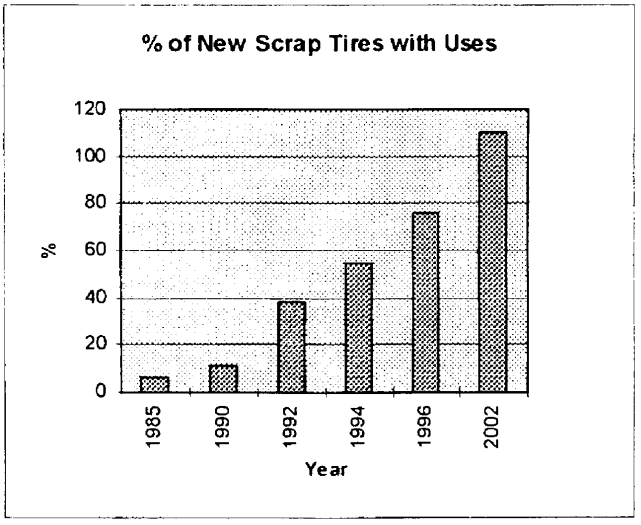

Figure 2

VIRGINIA

Virginia's Waste Tire Management Program (WTMP) is recognized across the country as a leader in the development, implementation, and support of waste tire management networks and markets for its waste tires. Information is available on DEQ's web site www.deq.state.va.us.

Since 1990, the Department of Environmental Quality (DEQ) has used the resources of the Waste Tire Fund (WTF) to foster the clean up of illegal waste tire piles, the clean up of waste tire piles at permitted landfills, the establishment of locality-based collection centers within regionally managed waste tire projects, and increased competitive access to processing systems for waste tires from the Commonwealth.

Since 1995, DEQ has worked to strengthen the markets for Virginia-derived waste tire material with its End User Reimbursement (EUR) program, providing a financial rebate to those who use Virginia tire material in their products or processes. During 1995, the first full year of operation, 71 reimbursement applications were filed with the DEQ. Payments of $1,705,575 were made for the use of 5,830,300 passenger tire equivalent units. Calendar year 1996 showed 99 applications and $2,210,196 was paid for the use of 7,606,200 passenger tire equivalent units. The Annual Report by the Director of the DEQ has not been published for 1997. However the semi-annual report for the first half of 1997 exhibits continued progress and growth of the program. The 6 months ending June 1997, when compared to the same period in 1996, marked a 78% increase in the volume of material used and an 88% increase in funds disbursed.

The use of scrap tires in Civil Engineering projects continues to dominate end-user reimbursements with 67% of the volume. The majority of the civil engineering usage is for daily landfill cover, leachate collection media, or other improvements in landfills. A new promising application approved during 1997 was as a replacement for stone in septic system drain fields.

Energy recovery through the use of tire derived fuels continues as the second most prevalent category of use. The semi-annual 1997 report shows energy recovery continuing at the same 29% of total volume used as the average reported in the first 2 years of the End-User Reimbursement Program.

The clean up of the tire storage piles has steadily increased. Both the End-User Reimbursement program and funds in the Waste Tire Trust Fund that accumulated before the inception of the End-User Program were used to remove the equivalent of 1,719,100 passenger tires from piles during the first 6 months of 1997. Of particular note was the progress made on the Sealston pile in King George County, the largest in the State. Since the change in the End-User Reimbursement rate for pile abatement in 1996 (from $30.00 to $50.00 per ton), 3,160,000 passenger tire equivalent units have been removed from the 8 primary piles in Virginia. There is some concern that this momentum may not be maintained. A significant percentage of the stabilization and clean up of the Sealston pile were paid through pre-End-User Funds. The funds that were in the Waste Tire Trust Fund prior to the inception of the End-User Program are now depleted. The End-User Reimbursement program limits the support payment to $50.00/ton and most of the remaining piles on the list will require considerably more than that amount to affect a clean-up effort. This leaves End-User Reimbursement as the only source of financial support.

PURCHASE OF RECYCLABLES

NATIONAL

It appears that recycled product availability and quality are improving and pricing is becoming more competitive. Plastic products, such as lumber, are still considerably more expensive than wood but last longer with less maintenance.

VIRGINIA

Virginia's experience generally reflects that of other states. A full line of recycled paper and a wide selection of office products are available on state contract. The Department of General Services surveyed state agencies on their recycled purchases in 1996 and found that a large number of these products are being used but few accurate records on volume are being maintained.

SOLID WASTE INDUSTRY

NATIONAL

According to the National Solid Waste Association (Washington, DC), over 7,000 communities currently have multi-material curbside collection service to over 110,000,000 people. Over 10,000 communities have drop-off programs, either single or multi-material, providing service to even some of the most remote rural locations in this country. The recycling rate may hit 30% in 1997 due to continued expansion in the last 2 years. Paper recycling continues to fuel the rise in the recycling rate. Approximately 50% of the increase between 1990 and 1995 came from paper recycling and another 25% came from increases in grass and leaf recycling.

VIRGINIA

The private sector of the solid waste industry continues to provide opportunities for recycling throughout the Commonwealth. Haulers offer services to cities and counties including collection, hauling, materials recovery facilities, curbside recycling, drop-off centers, and disposal. According to the Steel Recycling Institute, 79 cities, municipalities, and counties have curbside collection, serving 1,035,113 households and a population of 2,886,628. There are also 596 drop off sites.

RECOMMENDATIONS

Further Study by the Council

1. "Buy Recycled" - Successful recycling programs require a viable collection program, as well as, an outlet for the recovered material. The Commonwealth of Virginia can have an impact on the market for recycled materials. Two recommendations that the State can pursue to increase this market are as follows:

a) Virginia should make a commitment at the highest levels to purchase recycled content products. This can be accomplished by establishing and adequately funding a recycling program similar to those of states such as Maryland, Florida, and Georgia. The use of recycled materials by State agencies needs to be documented and incentives provided to agencies on their commitment to purchasing recycled content products.

b) Sufficient funding should be made available to promote consumer education on the benefits of using products with recycled content. Through their participation in collection program, the public has shown its environmental focus. Consumers need to be educated on the value of having a market for these materials and the importance of "Buying Recycled" to close the loop.

2. Reduce Cost of Recycling

a) Encourage efforts to improve transportation of recycables to make programs cost efficient. A recommendation, see Appendix II, has been made to offer a computerized transportation / logistics system that would allow Rural areas to link up with haulers to maximize loads and thereby reduce transportation and storage costs. The computerized network would have the added value of providing immediate access of rural suppliers with brokers.

b) Increase taxes and provide other incentives to reduce the cost of recycling

3. Post-Consumer Carpet Recycling

Initiate a pilot program focused on recovering nylon 6 post-consumer carpet at Virginia landfills. A successful program could significantly reduce the amount of waste carpet in Virginia's landfills. It is estimated that waste carpet represents 0.75% of the solid waste in Virginia. A proposal for a pilot collection program is presented in Appendix III.

Respectfully submitted,

Members of the Virginia Recycling Markets Development Council - 1997

Appendices

I - House Document 26 (1998) - Recommendations

II - Proposal from the University of Virginia and the Virginia Recycling Association to electronically link the State of Virginia to facilitate Litter Prevention, Recycling, Repurchasing, and Commerce.

III - Proposal to collect post-consumer carpet at landfills and via "special collection."

IV - Recommendations from the Construction and Demolition subcommittee of the Virginia Recycling Markets Development Council.

REPORT OF THE
DEPARTMENT OF GENERAL SERVICES IN
CONJUNCTION WITH THE VIRGINIA RECYCLING
MARKETS DEVELOPMENT COUNCIL ON

WAYS TO INCREASE THE STATE PURCHASE OF RECYCLED PRODUCTS

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 26

COMMONWEALTH OF VIRGINIA
RICHMOND
1998

Recommendations

DGS recommends the following:

- Expand the established Recycling Coordinator positions to include collecting and reporting on the volume of products being recycled and the use of purchased recycled materials through a standardized reporting system.

- Study successful recycling programs in other states to determine the impact on funding and staffing levels.

- If necessary, revise existing specifications for bids to allow the use of more recycled materials.

- Identify funding sources to cover the cost of increased prices for certain items if purchasing recycled materials is to be strongly encouraged or mandated.

- Develop a plan to address customer satisfaction issues.

- The Virginia Recycling Markets Development Council will assist DEQ in creating and maintaining a home page on the Internet that promotes "buy recycled".

APPENDIX II

Presentation to the Recycling Markets Council on December 12, 1995 By the University of Virginia and Virginia Recycling Association

The University of Virginia and the Virginia Recycling Association have brought forth a proposal to electronically link the the State of Virginia together to facilitate the broader use of Virginia's natural resources, improve waste management operational efficiency, and reduce costs. The University of Virginia would create the program and provide ongoing consultation for it while the Virginia Recycling Association would oversee its daily operation and promotion.

Such a system would provide Litter and Recycling Coordinators and Public Works Directors immediate access to such information as regulations and laws, case studies of existing programs (so they do not waste time reinventing), existing environmental libraries (e.g., EPA, Library of Congress), educational programs and materials, and vendors for recyclable commodities and transportation. Information would be simply a click of a mouse or arrow key away.

This information could lower costs in many ways. Purchasing agents, for instance, could share Requests for Bids/Proposals. Currently, four Authorities (Rivanna Solid Waste, Central Virginia Waste Management, Southeastern Public Service, Virginia Peninsular Public Service) have begun to meet three times a year in order to combine just these efforts. But by clicking an icon on a screen, each jurisdiction will have that same opportunity without expending the time and labor to meet. Presently, eight major universities in the State of Virginia are attempting to create a mechanism to greater improve the probabilities of combining purchases and RFP/Bs. This electronic link is that system.

The benfits only begin with purchasing agents. Rural recycling markets would benefit by having immediate access to brokers of post consumer material and transportation vendors who traverse this state. Rural locations, due to their disperse populations and lack of funds, often do not have the tonnage to warrant an enduser to dedicate a trailer for pickup, and these same rural areas often do not have the financial resources to allocate a building to store the required tonnage. With the proposed electronic environmental link system, a rural locality can post its need to have a transportation vendor pickup five tons of baled paper and deliver it to, for instance, an enduser in Richmond. A transportation vendor who is sending a partially filled truck to, or through, Richmond would click on the transportation category of the system and see that he could maximize his load and lower his cost by picking up the paper. Both parties would benefit. Commerce would be increased through this electronically friction free capitalism.

The benefit to the state is not just in the financial savings or lowering purchasing costs and increasing environmental commerce, however. The state's environmental regulatory agency's ability to reach out to Virginia's jurisdictions would increase exponentially. Through this electronic environmental link system, the Department of Environmental Quality would have direct access to each

jurisdiction. It could inform jurisdiction of potential grants, regulatory news, potential legislation. With this system, DEQ simply electronically mails the information and maintains a record of when it was viewed. Questions to DEQ could be sent immediately and responses processed and sent back much faster than it is today. The bureaucracy becomes even leaner and more responsive to Virginia's environmental concerns.

This system does work. The University of Virginia has done something similar with all the universities in North America (Mexico, the United States, and Canada). The internet has been working since the early 1960s and its infrastructure is in place. It is this aspect that makes the University of Virginia and Virginia Recycling Association's proposal so appealing. The startup cost is low.

Virginia's universities and colleges already are tied to the internet. If each of these colleges allowed the VRA to place a phone line and modem into its system, then each locality could access the UVA/VRA server at the price of a local phone call. Some colleges may fear that such a phone line and modem may provide users with uninhibited access to that school's system. This can easily be prevented by fire-walling its system out. Users, in other words, of the UVA/VRA system could only use that system. Jurisdictions that find themselves on a tight budget could use a 1982 Apple computer to utilize this system. The cost of access for communities would be negligable.

Starting up the electronic environmental link system would take very little machinery (a server and modems), some phone lines, massive amounts of inputting of data, and a lot of publicity and education. For less than a hundred thousand dollars, the system could be operating, information placed in the system, and publicity and education conducted around the state. Environmental vendors, always wanting to go where the customers are, would provide funds to place their information on the system. Within two years of operation, this system would be self-sufficient. For less than a hundred thousand dollars, Virginia would take a quantum environmental and bureaucratic leap past any other state in the nation and provide a foundation that could be expanded at minimal cost.

The University of Virginia and the Virginia Recycling Association are asking Governor Allen's Administration to utilize its resources to allow these two organization to work closely with the Departments of Education and Environmental Quality in order to maximize an existing electronic infrastructure, to maximize practical environmental activities, and to maximize commerce.

Proposed Activities for 1997 & 1998
Post-Consumer Carpet Demonstration Collection Program:
Landfills and Special Collection

AlliedSignal estimates that carpet waste accounts for 0.75% of Municipal Solid Waste (MSW) disposed of annually in Virginia. While carpet is a benign material and not a significant part of the solid waste stream, it offers the potential for an economically sustaining recycling program and the creation of significant number of jobs.

NYLON is one of the highest valued recycled plastics material currently available in the market! Over 75% of the nylon manufactured in the United States is used as face fiber in carpets. Based on these 2 factors, several major companies, including AlliedSignal, are evaluating post-consumer carpet recycling programs. DuPont and Wellman are supplying nylon parts to Ford with 25% post-consumer material recovered from carpet through mechanical separation.

AlliedSignal is evaluating the feasibility of recovering caprolactam - the monomer or basic building block for nylon 6 - from waste nylon carpet. Caprolactam is currently manufactured in Hopewell. The recovered caprolactam would be used to produce virgin quality products at the Chesterfield facility. Based on a life cycle analysis, caprolactam recovered through depolymerization requires 75% less energy than from the current manufacturing process utilizing crude oil as the raw material. Not only does carpet recycling reduce solid waste, but it also has major environmental benefit.

The major barrier to a successful recycling program is the collection process both from a cost as well as volume perspective. A significant portion of the waste carpet is returned to the carpet retailer where the new carpet was purchased. Currently this material is landfilled but AlliedSignal has identified and piloted several viable collection scenarios involving retailers. Other significant disposal processes for post-consumer carpets are: direct disposal at a landfill by carpet installers as well as the consumer; and curbside collection via special collection or "white goods" collection. Usually these special collection programs involve city or county governments. These latter scenarios can involve significant amounts of material especially in larger cities such as New York where curbside collection is offered for free and some of the material is disposed of in Virginia.

This proposal involves a joint program between the VRMDC, AlliedSignal, and a local county, preferentially Chesterfield, to evaluate the feasibility of collecting

carpets at landfills and from "Special Collection" pick-ups. The model developed in this study can be utilized throughout Virginia as well as the rest of the country to support the waste carpet market creation and, as a result, increase jobs and reduce solid waste.

Virginia already has a vested interest in the front end of nylon production! Both DuPont and AlliedSignal have major nylon manufacturing facilities in Chesterfield, Hopewell, and Waynesboro. This proposed pilot effort, focused on the end of the nylon "Life Cycle", can breath new / additional life into nylon and support the recycling programs undertaken by these two major Virginia companies.

APPENDIX IV

Recycled paper

BFI Waste Systems™
BROWNING-FERRIS INDUSTRIES

Dulles District

June 5, 1997

Paddy Katzen
Department of Environmental Quality
629 E. Main Street
Richmond, VA 23219

RE: **Recommendation for the Recycling Markets Development Council**

Dear Paddy:

Attached please find a recommendation that DEQ be given the necessary funding to do a detailed study of potential markets for the primary recyclable materials that are in C&D debris. The proposed study we think would be best conducted by the DEQ with close coordination by VDOT.

This recommendation has been approved by the Committee as a recommendation that could have a substantial positive impact on the state of C&D recycling in Virginia. Before serving as chair of the C&D Recycling Committee, I was a member of the VDOT Recycling Committee that resulted from SB 469 in 1994. The detail and depth of work can be performed by voluntary committees has its limits. While such committees are an important source of recommendations, a funded, professional study is a better tool to do such a market study.

Our presentation from Bob Horan from VDOT impressed upon the committee the high potential that exists to consume materials from the C&D waste stream in State construction projects. Properly identifying and acting on these opportunities can lead to strong private sector demand for these materials.

As part of our charter to make recommendations that will promote the recycling of C&D materials, the committee would like to ask the Council to consider endorsing this proposal, and presenting it to the Governor, General Assembly, and DEQ.

Thank you for considering this matter.

Sincerely,

Paul Gilbert
Chair, C&D Recycling Committee

SUBMITTED
8/18/97

Construction and Demolition Debris Recycling Committee

At the September 19,1996 Virginia Recycling Markets Development Council meeting in Lynchburg, the Council's Item IV of the agenda was a review of " Opportunities for New Directions in Reuse and Recycling ." In addition to presentations on Carpets and Textiles, the Council also heard a national overview and presentation on the subject of Construction Waste and Demolition Debris Recycling (C & D Debris Recycling).

As a result of action taken by the Council, a five member C & D Debris Recycling Committee was set up (see Attachment A for the members names) and conducted their first meeting on November 21,1996. As background to the meeting the legislation that set up the Council was distributed so as to inform the new Committee of the eight functions or goals of the Council.

To date, the Committee has had three substantive meetings with sessions devoted to two-hour meetings with representatives of (1) the Department of Environmental Quality (DEQ); (2) the Virginia Department of Transportation (VDOT) and, (3) the National Association of Homebuilders (NAHB) Research Center.

The primary information that has been received by the Committee includes:

The 1996 Annual Report of the Virginia Recycling Markets Development Council that was prepared for the Governor and the General Assembly of Virginia;

The November 15, 1996 DEQ Draft Solid Waste Management Regulations

September 30,1996 "Final Report of the States' Use Of Waste and By-Product Materials" compiled by the Association of State and Territorial Solid Waste Management Officials

1994 Report of the Virginia Department of Transportation (Senate Document No. 53) titled "The Use of Recycled Materials in Highway Construction"

Certain handouts by VDOT that included excerpts on different material specifications from their 1994 VDOT specifications handbook

While the next formal meeting of the Committee is not scheduled until June 19 at the Prince William County Solid Waste Department Offices, the Committee does feel very strongly that at least one specific issue should be brought to the table at the June 10 Council meeting for your consideration and possible action. As an attachment to this brief overview of the Committee's activities to date, please find this recommendation and a short background prospective that has also been discussed by the members of the Committee.

Construction and Demolition Debris Recycling Committee Recommendation

C & D Materials Quantification and Market Assessment

Recommendation:

Based on the background information shared by the VDOT representative that spoke to the Committee on January 9, 1997, and the review of the 1994 VDOT report on "The Use of Recycled Materials in Highway Construction", it is the observation of the Construction and Demolition Debris Recycling Committee that VDOT is in an excellent statewide position to influence, expand and incorporate additional raw materials derived from the processing and recycling of waste materials originating from new construction and demolition projects. The Committee feels that a more pro-active role of VDOT and the use of recycled materials into their traditional construction activities, and the many related ancillary physical projects undertaken by many contractor's around the Commonwealth, (i.e. berms, mounds, mulching, pipe-bedding backfill, pot-hole patching, etc.) that are not necessarily traffic nor major loading bearing structures, can be an excellent market for these otherwise landfilled waste materials.

Therefore, the Committee recommends that the State immediately provide $100,000 to the DEQ for the commissioning of a C&D constituent based materials markets study focusing on the following four specific C&D waste stream derived materials: wastewood, gypsum wallboard, asphalt roofing shingle tearoffs, and screened fines from C&D waste processing materials. Due to the statewide origin of these waste materials, the Committee feels that the DEQ should be the lead agency soliciting the study and VDOT should be a task force member providing input on their markets based data, materials use and cost information, specifications, project guidance and strategic review of the information.

Background

At the present time, large quantities of virgin materials are being consumed in VDOT projects around the Commonwealth while several million tons of locally generated materials and waste products from a myriad of publicly and privately financed new construction, renovation and demolition projects are being abandoned and landfilled as "unusable waste materials". Because of either the small quantity of materials generated on a specific project or there actual characteristic, these materials may indeed be of no value, be unsalvageable, be unusable or otherwise be non-recoverable to the specific construction or demolition project that generated these materials. But that does not mean that private entrepreneurs or regional handlers, e.g. C&D waste processors and recycling companies, could not collect, accumulate, process and refine certain of these C&D based materials for local VDOT projects, and other commercial construction projects that are otherwise consuming vast arrays of materials on projects taking place all over the State.

Because of the broad responsibility of VDOT, the Committee believes that VDOT can and should be taking a much more active role in the State in order to enhance the "potential markets" drive for C & D waste based recycled products. VDOT should be much more aware of the current information database and material options available from the C&D waste material as a way to reduce the consumption of virgin materials on the myriad of VDOT projects. Additionally, many of the private engineering firms and commercial contractors look to the VDOT specifications for their guidance in materials selection.

It is within this framework that the Construction and Demolition Debris Recycling Committee recommends that the Commonwealth of Virginia, through the DEQ, perform a state-of-the-art report specifically for the Commonwealth of Virginia pertaining to the four primary materials within the C & D waste stream that are the largest components of the C&D waste stream and could offer the highest and best uses of this material within the confines of the VDOT charter of responsibility and material use specifications.

As the Construction and Demolition Debris Recycling Committee members discussed with the VDOT representative in January, the issue is not recycled asphalt pavement (RAP) and crushed concrete. The bulk of these materials are usable and typically being deal with unless the problem is a marketing issue that somehow is creating a recycle based feedstock in a region of the State where new construction based needs do not exist. The Committee does not believe RAP or the use of crushed concrete to be a priority "waste oriented" issue. Rather at a minimum, the types of materials that the Committee feels that the Commonwealth should evaluate for both a quantitative review and end-use market opportunities include discarded woodwaste, gypsum drywall, asphalt roofing shingle tear-offs and screened fines from construction, renovation and demolition related projects.

When the Committee heard the January presentation / overview of VDOT's research and end-use activities in the utilization of some of these secondary materials, at least one Committee member familiar with the C&D waste recycling industry at a national level indicated that there has recently been, and continues to be, a considerable amount of activity in the utilization of these materials in commercial products as well as certain roadway oriented projects, including uses as sub-base, embankments, tree planting programs, asphalt substitution, pot hole patching, road noise barriers, hydro-mulch products, etc.

While the Federal Highway Administration (FHA) and other transportation groups publish certain technical research reports and other more generic data on the reuse of asphalt and concrete as it pertains to federal highway oriented projects and specifications, and literature searches may be acceptable for certain background and introductory levels of information on these lessor utilized materials, the alternative uses and integration of the latter materials have not been a priority FHA issue. They are primarily the focus of waste

management officials and not a key transportation oriented issue. Hence, a lot of the current and most relevant cutting-edge information on the C&D waste generators and users of these secondary materials tends not to be readily distributed within the nationwide transportation sector of the economy.

Therefore, due to the recent evolution of the C&D recycling sector of the waste industry, the competitive edge base of information and ongoing product improvements are sometimes only known by a small inside segment of the waste industry that travels in that C&D waste circle. For these reasons, many of the newer facilities, market applications and strategic information, including the vendors making these products or equipment as well as contractor data on applications in nontraditional transportation but not road surface uses, is kept close-to-the-vest or only regionally known.

Investigating, compiling and evaluating the uses of this markets and products database, as they may be directly applicable for use in the Commonwealth, including, in part, VDOT and other privately funded road and related construction projects (e.g., commercial parking lots subbase or other projects allowing the use of recycle content materials incorporation into berm/plantings and barrier designs), as well as the background on the manufacturers of these new products, is recommended by the Committee for compilation and evaluation by the DEQ.

In summary, the Committee feels that the several million tons per year of C&D waste material that is currently being landfilled in the Commonwealth of Virginia is (1) a "sleeping giant" of a byproduct of the construction and demolition waste industry which the Committee feels is currently not understood as a strategic material resource; (2) the specific availability and barriers to broader utilization of this material in the Commonwealth are not yet adequately defined; and (3) the material is not being tapped to its' full potential by VDOT and general contractors around the Commonwealth due to institutional, economic and other reasons not yet fully documented at the State level.