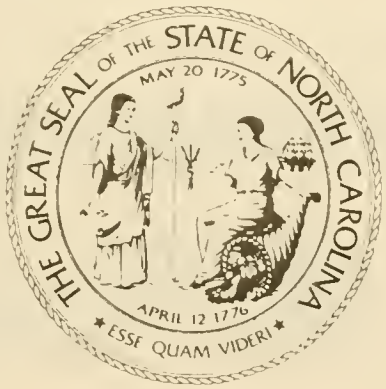
HAZARDOUS WASTE STUDY COMMISSION OF 1983

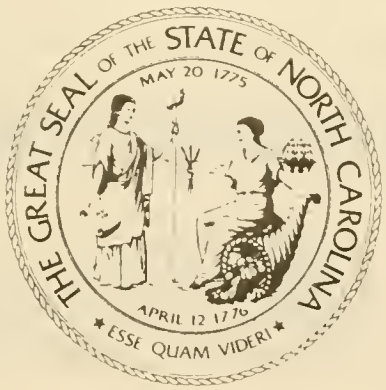
POLLUTION PREVENTION



REPORT TO THE LEGISLATIVE RESEARCH COMMISSION

HAZARDOUS WASTE STUDY COMMISSION OF 1983

POLLUTION PREVENTION



REPORT TO THE LEGISLATIVE RESEARCH COMMISSION

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On May 17, 1984 the Legislative Research Commission met and accepted the report of the Hazardous Waste Study Commission on the matter of the creation of a Pollution Prevention Pays Research Center in North Carolina.

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April 27, 1984

TO: The Members of the Legislative Research Commission:

The Hazardous Waste Study Commission of 1983 herewith reports to the Legislative Research commission on the matter of the creation of a Pollution Prevention Pays Research Center in North Carolina. The report is made in response to the letter of September 27, 1983 from House Speaker Liston Ramsey and Senate President Pro Tempore W. Craig Lawing, Cochairmen of the Legislative Research Commission, to Representative Martin Nesbitt and Senator Joseph Thomas, Cochairmen of the Hazardous Waste Study Commission of 1983, in which the latter commission was requested to "study the matter addressed in Resolution 54 (Senate Bill 653)." Resolution 54 authorized the Legislative Research Commission "to study the desirability and feasibility of creating a Pollution Prevention Pays Research Center in North Carolina."

Respectfully submitted,

Rep. Martin L. Nesbitt Sen. Joseph E. Thomas

Cochairmen
Hazardous Waste Study Commission of 1983

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INTRODUCTION

The Legislative Research Commission, originally created in 1965 and authorized by Article 6B of Chapter 120 of the General Statutes, is authorized pursuant to the direction of the General Assembly "to make or cause to be made such studies of and investigations into governmental agencies and institutions and matters of public policy as will aid the General Assembly in performing its duties in the most efficient and effective manner" and "to report to the General Assembly the results of the studies made," which reports "may be accompanied by the recommendations of the Commission and bills suggested to effectuate the recommendations." G.S. 120-30.17. The Commission is chaired by the Speaker of the House and the President Pro Tempore of the Senate, and consists of five Representatives and five Senators, who are appointed respectively by the Cochairmen. G.S. 120-30.10(a).

Resolution 54 of the 1983 Session Laws (Senate Joint Resolution 653) authorized the Legislative Research Commission "to study the desirability and feasibility of creating a Pollution Prevention Pays Research Center in North Carolina". See Appendix C. By letter dated September 27, 1983, the Cochairmen of the Legislative Research Commission requested that "the Hazardous Waste Study Commission of 1983 study the matter addressed in Resolution 54." See

Appendix D. The Hazardous Waste Study Commission was created by Chapter 926 of the 1983 Session Laws (Senate Bill 701) to "study alternatives to landfilling hazardous wastes including prevention, reduction, treatment, incineration and recycling." The Hazardous Waste Study Commission was to report to the 1984 regular session of the 1983 General Assembly by May 1, 1984. See Appendix B.

The basis upon which the Legislative Research Commission asked the Hazardous Waste Study Commission to undertake the study authorized by Resolution 54 is contained in the letter of September 27, 1983, "the constraints on the Legislative Research Commission's budget, the close alliance of the subjects of hazardous wastes and of the establishment of a pollution prevention pays research center, and the importance of these topics to economic environmental and public health of this state."

This report represents the report of the Hazardous Waste Study Commission of 1983 in response to the request of the Legislative Research Commission, as contained in the letter of September 27, 1983. The separate report of the Hazardous Waste Study Commission can be obtained through the Legislative Library.

Committee Proceedings

The Hazardous Waste Study Commission of 1983 ,met six times between its formation and the approval of this report. At its first meeting in October of 1983 in Asheville, the Commission adopted a three tiered "hierarchy of alternatives" in management of hazardous waste. At the first level of management are in-plant processes through which the potential generator of waste can alter manufacturing operations of recycle materials on site to eliminate or prevent the generation of hazardous waste. Much emphasis was placed on the need to discover and share methods of prevention at this first level of hazardous waste management. To eliminate or prevent hazardous waste before generation was shown to be safer and more economical than treatment or disposal of such waste.

At its third meeting, the Commission spent a substantial portion of its time listening to proposals dealing with "pollution prevention pays" and how pollution prevention programs can be implemented and shared in North Carolina. Speakers included representatives of the North Carolina Board of Science and Technology, the university system and the Division of Environmental Management within the Department of Natural Resources and Community Development. These entities and others, notably the Governor's Waste Management Board, the Solid and Hazardous Waste Branch of the Division

of Health Services in the Department of Human Resources and other state agencies, have been and will continue to be involved in pollution prevention efforts which involve regulation of waste generators, dissemination of information and other assistance to those generators and research to determine how best to make pollution prevention pay. The level of coordination and cooperation with which these agencies have pursued their goals impressed the members of the study commission, as did the cooperative nature of the relationship between the various government agencies, and those in the private sector.

Despite this extraordinary degree of cooperation, the Commission became aware of differences in perception of how a "Pollution Prevention Pays Research Center" should evolve and be structured. Several questions were raised in the course of discussion as the commission became more specific in carrying out to "study the desirability and feasibility of creating a Pollution Prevention Pays Research Center in North Carolina" through, in part, analysis of "the advantages and disadvantages of centralizing information, resources, and expertise in a Pollution Prevention Pays Research Center or such other organizational arrangement as may seem appropriate." Resolution 54, 1983 Session Laws (Senate Joint Resolution 653). In the context of this charge, the Commission began to ask questions of those testifying, questions designed to define the rules of the various agencies and boards involved in North Carolina's pollution prevention

effort. Among the issues with which the study commission dealt are questions about the role of estate regulatory agencies, particularly the Departments of Human Resources and Natural Resources and Community Development: How can we make best use of the agencies' close day-to-day awareness of specific industry problems without violating the legitimate privacy of the industries and without sacrificing the distance between industry and agency which is necessary for effective and even-handed regulation? The commission also considered the role of advisory boards, particularly the Board of Science and Technology and the Governor's Waste Management Board, which are not regulatory in nature but which cannot themselves conduct technical research. Thus far, both boards have effectively conducted programs designed to spread information and increase awareness on the part of the public and in the industrial community and both boards have cooperated in grant programs through which pollution prevention research has been funded (See findings). Whether these roles should be expanded, or others undertaken, remains at issue.

Finally, and most important, the commission heard discussion of how a Pollution Prevention Research Center might be structured: whether as a loosely knit information network of state agencies and boards and voluntary participants from industry; a research referral operation focusing on liaison between industries seeking effective methods of pollution prevention and university or other research

organizations which might, on a contract basis, perform the necessary research; an extension service operation with a small central staff and a series of regional operations (research or referral); or a major centralized facility, with technical laboratory research capability and/or extensive relation with industry and research organizations, to be funded, to a major extent, by participating industry, individually or in groups or associations.

On the basis of the discussion at the commission's third meeting, the various agencies involved, particularly the Department of Natural Resources and Community Development, those representing the university system and those representing the Board of Science and Technology, were asked to work with legislative staff to generate a proposal on which all groups could agree (and in which all could continue to participate) but which would not involve extensive commitment on the part of the General Assembly to substantial appropriations during the short 1984 legislative session.

At its fifth meeting, February 24, 1984, the commission heard from James Summers, Secretary of the Department of Natural Resources and Community Development. Mr. Summers outlined to the commission an expanded pollution prevention effort consistent with the commission's instructions (See recommendations). The Hazardous Waste Study Commission of 1983 completed the Pollution Prevention Pays Study

authorized by Resolution 54 of the 1983 Session Laws on April 26, 1984 with approval of this report.

FINDINGS

The Hazardous Waste Study Commission of 1983 finds:

1. It is environmentally, technically and economically superior to eliminate the sources of pollution before cleanup problems are created.

2. The pollution prevention approach provides a positive and non-regulatory framework for industry, state and local governments, the research community and citizen groups to work cooperatively in addressing the problems of toxic and hazardous substances by emphasizing the prevention of accumulated wastes through the modification of production, processes and the use of less hazardous inputs to these processes and by promoting the use of technologies that recycle, recover, detoxify and destroy hazardous waste. The pollution prevention approach provides a unifying theme through which to protect the public's health and the integrity of our ecosystems because the approach can be applied generally to management of toxic substances whether these substances are defined as substances, materials or waste and regardless of whether they are discharged into the air, water, land or the workplace.

3. A strong regulatory program is essential for the success of a pollution program. It raises the costs of managing residuals and provides incentives for waste generators to attempt to minimize costs. An effective and fairly administered regulatory program wherein the regulators work with industry on a cooperative rather than adversary basis to maximize voluntary compliance and beyond-minimum efforts can also generate a data base through which we can analyze where common problems exist and what kinds of technical assistance are most needed by the regulated community.

4. Research, education and technical assistance are also essential to successful pollution prevention, as mechanisms for identifying and developing technical solutions to pollution problems, for increasing awareness of both problems and solutions on the part of generators and for transferring knowledge of solutions from those who have it to those who do not, particularly smaller industries without resources to generate solutions without assistance.

5. Any analysis of waste streams that emphasizes or incorporates pollution prevention technologies must be based on reliable information concerning volumes and types of wastes, chemical composition, production processes, management practices, environmental and health effects of the substances and economic political and institutional

constraints on management options, while taking into consideration legitimate business needs to protect proprietary business information.

6. A Pollution Prevention Research Center must incorporate, through a structure and relationships based on an as yet incomplete information base, certain essential features or characteristics. It must be non-regulatory and distinct from the regulatory agencies; yet operate in conjunction with existing agencies and institutions (regulatory and otherwise) in carrying out its activities. It must provide service and assistance through research, education and technical assistance and must serve the general public as well as the industrial community, particularly those members of the industrial sector whose resources and size do not permit extensive and independent pollution prevention efforts.

7. Before a Pollution Prevention Research Center is established to pursue a comprehensive and integrated approach to environmental management, the structure and functions of such a center need to be clearly defined. Specifically, more complete information must be available in relation to the needs of the industrial sector, how these can be satisfied through the research community and how best to structure an institutional link between these communities. Through the Pollution Prevention Pays program

program operated by the Board of Science and Technology, with participation on the part of the Governor's Waste Management Board and various state agencies, through grants to members of the research community, such an information base can be developed. Further, the Pollution Prevention Program within the Division of Environmental Management of the Department of Natural Resources and Community Development provides an excellent opportunity to increase awareness on the part of the industrial community of the need for pollution prevention. Such a program, operated in a spirit of cooperation between the regulatory agency, will facilitate generation of base of information on what specific and common problems exist in the industrial sector, problems to be investigated and solved through a Pollution Prevention Research Center. A central program within the agency, with adequate staffing and funding, is required to accelerate the process of information collection, organization, application and evaluation. Through this process, and that underway in the research community, a proper foundation can be created on which can be structured a Pollution Prevention Research Center which meets real documented needs through practical and available research capability.

RECOMMENDATIONS

The Hazardous Waste Study Commission of 1983 recommends:

1. That the General Assembly endorse and provide resources for a Pollution Prevention Program within the Division of Environmental Management through which the department will be able to focus on ways to reduce and eliminate causes of pollution and through which adequate information can be generated in relation to what common obstacles to pollution prevention exists within the regulated community and, thus, what technical, research or other services should be provided to overcome these obstacles. Consistent with the requirement of G.S. 143B-216.13(2) requiring the Governor's Waste Management Board to "periodically review the state's comprehensive waste management system and make recommendations to the governor, cognizant state agencies, and the General Assembly on ways to improve waste management; reduce the amount of waste generated; maximize resource recovery, reuse, and conservation; and minimize the amourt of hazardous waste and low-level radioactive waste which must be disposed of," the committee endorses the Board's recommendation that the Department of Natural Resources and Community

Development be the lead agency in Pollution Prevention efforts and specifically recommends that the General Assembly endorse a program within that Department which incorporates the following elements:

a. Establishment of an information clearinghouse on pollution prevention efforts, to include all references, including articles, research papers, and case studies relating to pollution prevention will be obtained, reviewed and categorized by Standard Industrial Code (SIC) process, and EPA Waste Code as appropriate. Such organization will make information transfer much easier and more specific to the user. The clearinghouse be based on existing, published work from Europe, Canada, and the United States and be supplemented by work already underway regarding North Carolina cases in pollution prevention. References be made available on call, and an annotated listing widely distributed.

b. Specification of ways to incorporate pollution prevention information and philosophy into all program activities of the Department of Natural Resources and Community Development as well as those of other state agencies noticeably the Departments of Agriculture, Human Resources and Labor. The Division of Environmental Management is unique in having daily contact with industries and municipalities throughout the State. Programs in water, air, and groundwater affect existing industry and new industry locating in North Carolina. Specific, positive

ways and procedures should be developed to help exchange information on pollution prevention with industrial and municipal representatives in the following areas: water quality discharge permits (NPDES); non-discharge permits; air quality permits; municipal and industrial pre-treatment programs; industrial revenue bond reviews; facilities planning; groundwater monitoring; and compliance monitoring. Close coordination with related programs in the Department of Human Resources is essential to assure multi-media waste reduction perspectives.

c. Categorization of all regulatory documents by Standard Industrial Code. Where possible, the Division's computerized system for tracking permits should be modified to include the four-digit Standard Industrial Code reference, thus making it possible to match specific pollution prevention research and information to particular industrial users. Such an information network will also provide a way and help to identify steps industry is taking to prevent pollution. Referrals of information and places for technical assistance can also be made. This organization will enable further coordination with the Department of Commerce in getting PPP information to new industry locating in the State.

d. Development of a series of training sessions throughout the state on pollution prevention technologies, applications and case examples. Several successful workshops and training sessions have been held in North

Carolina. These should be built upon to focus on the respective industrial mix in a particular region and the positive ways in which regional staff can work with industries and municipalities on pollution prevention efforts. Industries in the respective region should be encouraged to participate, particularly those implementing pollution prevention strategies in the region. This will further aid in establishing a local working network between the Division and industry. Joint workshops with the Department of Human Resources regarding solid and hazardous wastes should be part of this effort.

e. Development of an effective public information program describing and encouraging effective pollution prevention efforts and introducing the program to a broad audience. Such a program will assure continued exchange of information on the program and should incorporate success cases in the State; annotated references to articles, research, or technical assistance; announcements of workshops and training programs; and other information should provide a broad network of communication among industries, trade associations, public interest groups, universities, and government agencies.

f. Identification and compilation of case studies on pollution prevention efforts on the part of North Carolina industries. Industries nominated for the Governor's Award of Excellence in Waste Management can provide a first step in compiling case studies through contacts in each of the

seven Regional Offices across the State, additional examples can be identified and documented. Such North Carolina specific success stories can significantly increase local awareness of economic and environmental benefits of pollution prevention efforts. Specific studies could be published as a single document available through the clearinghouse and used in workshops and training sessions statewide.

g. Conducting of an on-going survey of industrial and municipal needs and opportunities in pollution prevention. A simple survey form should be developed and used during each contact with industries and municipalities relating to pollution prevention. The brief survey should be conducted by respective staff in Raleigh and each Regional Office as part of usual, daily contact with industry. This will provide a uniform method of collecting data on information needs, gaps in research, success stories, technical assistance needs, and other information on pollution prevention from the perspective of the user. Success stories would be followed-up as example case studies for the particular industry and distributed statewide by use of the clearinghouse, newsletter, workshops. Information on data gaps and research/technical assistance needs would be exchanged by liaison with trade associations, universities, public interest groups, and other government agencies. The SIC identification of EPA waste code should be used to cross-reference case studies and related research to further expand the clearinghouse information base.

h. Development of a positive incentives program which encourages implementation of pollution prevention efforts. This program could be developed in conjunction with trade associations, business community, and other agencies. Incentives related to opportunities and constraints posed by regulations should be identified as will economic incentives. In addition, demonstration projects of innovative or test case approaches should be encouraged and assisted which advance pollution prevention technology and its implementation across the State.

i. Encouragement of the application of environmental auditing systems as a tool in pollution prevention. Environmental Auditing, similar to financial auditing can provide a way to identify environmental risks, reduce compliance difficulties, and document pollution prevention pays opportunities. Successful approaches in North Carolina, supplemented by other examples, should be compiled in an information package and widely distributed. The concept of an Environmental Auditing Roundtable could be developed as a positive means to foster public and private sector discussions on environmental auditing efforts.

j. Development of pollution prevention indices. The great amount of available data on pollution and environmental quality should be reviewed in light of the program's objectives to reduce, eliminate or recycle pollutants. In addition to environmental quality indices, information from industry on cost savings and economic benefits should be

compiled. By effectively combining information on environmental benefits and economic benefits into easily understood indices, the efforts of the program can be evaluated and fine-tuned. The pollution prevention indices could be approached initially on a prototype rive basin and then expanded statewide.

k. Establishment of a Governor's Award program for excellence in pollution prevention for industrial and municipal categories. The awards would be given to top entries of industrial and municipal examples of successful pollution prevention programs. Awards would be made to significant entries representing each Regional Office and top entries among those showing statewide importance. Nominations and awards recipients would expand the cooperative network in the Regional Offices and provide North Carolina cases for information exchange.

l. Coordination, liaison and support to public and private institutions in pollution prevention efforts, particularly the Governor's Waste Management Board; the Department of Human Resources; the Department of Commerce; Trade Associations; the N.C. Board of Science and Technology; Universities and related Institutions; and Public Interest and Environmental Groups.

The committee recommends that the Division of Environmental Management within the Department of Natural Resources and Community Development, the lead agency in pollution prevention efforts, report to the 1985 General Assembly on

the need for a Pollution Prevention Research Center as well as the location, functions and structure recommended for such a center; these recommendations to be based on the information gathered through the expanded program described in this recommendation.

2. That the General Assembly endorse and continue pollution prevention demonstration projects funded through the North Carolina Board of Science and Technology. Examples of successful applications of pollution prevention technologies in North Carolina industries would provide other industries in the state with specific technical and economic information on pollution prevention strategies. In addition this type of information is valuable because it provides a level of confidence in these technologies that is not always achievable with words and figures presented in a text. Exemplary cases of successful applications of waste reduction can be developed through demonstration projects.

The goals of pollution prevention demonstration projects are to (1) provide industries with examples of successful applications of prevention technologies; (2) perform analyses to identify activities with the greatest potential for waste reduction and cost savings in a particular industry; and (3) promote cooperation between the business community and the research community. These

demonstration projects are a fundamental component of the overall program and they provide information that can be incorporated into the industry specific or waste stream specific pollution prevention guides and workshops. In addition, they can aid in the development of a more general technical assistance program for industries in the state.

3. That the General Assembly endorse and continue pollution prevention workshops funded through the Board of Science and Technology.

In April 1983, pollution prevention workshops for the electroplating and metal finishing industries were held at UNC-Charlotte and North Carolina State University. More than 150 representatives from electroplating firms operating in North Carolina attended. Participants were generally enthusiastic about the workshops and requested future workshops be held to focus on specific technical and economic issues related to waste reduction programs.

Industry specific (e.g. textile, furniture and chemical industries) or waste stream specific (e.g. solvents, electroplating sludges) workshops are needed in addition to these already held for the electroplating industry in order to facilitate the flow of information from the research community and between firms. The workshops also serve as a valuable forum for researchers and educators to identify additional industry needs. As more information becomes available on small generators, the chemical composition of

specific waste streams, the workshops can be more narrowly focused for particular audiences. It would seem appropriate to conduct initial workshops at a level of specificity similar to the workshop for the electroplating and metal finishing industries. These initial workshops would be followed by more technically specific workshops that incorporate information from the demonstration projects, the industry specific pollution prevention guides, and other aspects of this program.

4. That the General Assembly endorse, encourage and support initiatives forthcoming from the university system and other elements of the research community to conduct and expand research efforts designed to augment pollution prevention, whether funded through other government agencies, contractual arrangements with industry or direct state appropriations to the university system. Recognizing that our university represents an invaluable statewide system for conducting the "hands on" technical investigation necessary to make pollution prevention pay, this investigation must be encouraged.

The Committee specifically recommends initiation of a pollution prevention pays project through North Carolina State University, a project which incorporates the following tasks and goals:

a. Detailed study of various production processes that

generate hazardous waste in the chemical industry. Much information on the nature of the wastes exists; thus the major effort of this task will be to assemble the data in a useful form. A very important part of this activity, one requiring close interaction with industry, will be to obtain detailed information on processes that generate wastes.

b. Determination of which processes should be the focus of further work and development of interactions with industrial locations using these processes.

c. Determination of appropriate methods to reduce, eliminate or recycle the wastes generated by these processes. North Carolina's chemical industry is characterized by a large number of small and technically unsophisticated companies. An important part of the project will be an effort to use technology developed by large companies, with their engineering capability, to help solve the waste problems of the small companies.

d. Implementation of several pollution prevention techniques in the chemical industry; through project implementation and information dissemination involving direct involvement with industry, workshops and technical meetings, reports and manuals.

The Committee endorses and supports University budget requests totalling approximately $145,000 to initiate the pollution prevention program at North Carolina State University.

MEMBERS

LEGISLATIVE RESEARCH COMMISSION 1983-84

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STATE OF NORTH CAROLINA

LEGISLATIVE RESEARCH COMMISSION

STATE LEGISLATIVE BUILDING

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September 27, 1983

Senator Joseph E. Thomas, Cochairman
Hazardous Wastes Study Commission
P.O. Box 337
Vanceboro, North Carolina

Representative Martin L. Nesbitt, Cochairman
Hazardous Wastes Study Commission
Suite 814, Northwestern Bank Building
Asheville, North Carolina 28801

Dear Cochairmen:

By Resolution 54 (Senate Bill 653), the General Assembly authorized the Legislative Research Commission to study the feasibility of establishing a Pollution Prevention Pays Research Center in this State. The Commission has determined that it has insufficient funds to study all of the matters which it is authorized to study.

The Commission in reviewing the matter of a pollution prevention pays center has noted the charge to the Hazardous Wastes Study Commission of 1983 "to study alternatives to landfilling hazardous wastes" and "of what can be placed in a hazardous waste landfill without posing a threat to the environment or to the health and safety of the general public." (Chapter 926 (Senate Bill 701) of the 1983 Session Laws.) In view of the constraints on the Legislative Research Commission's budget, the close alliance of the subjects of hazardous wastes and of the establishment of a pollution

prevention pays research center, and the importance of these topics to economic environmental and public health of this State, the Legislative Research Commission would respectfully request that the Hazardous Wastes Study Commission of 1983 study the matter addressed in Resolution 54 (Senate Bill 653), copy attached.

Respectfully,

W. Craig Lawing
Cochairman

Liston B. Ramsey
Cochairman

Copy to: Jim Blackburn

GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 1983
RATIFIED BILL

CHAPTER 926
SENATE BILL 701

AN ACT CREATING THE HAZARDOUS WASTE STUDY COMMISSION OF 1983.

The General Assembly of North Carolina enacts:

Section 1. Creation of commission; membership. There is created in the General Assembly the Hazardous Waste Study Commission of 1983. The Commission shall consist of 10 members appointed as follows:

(1) Three members of the Senate appointed by the President of the Senate;

(2) Three members of the House of Representatives appointed by the Speaker of the House of Representatives;

(3) Two environmentalists, one appointed by the President of the Senate and one by the Speaker of the House of Representatives; and

(4) Two representatives of industry, one appointed by the President of the Senate and one by the Speaker of the House of Representatives.

The President of the Senate and the Speaker of the House of Representatives shall each designate one of his appointees to serve as cochairman of the Commission.

Sec. 2. Duties of Commission. The Commission shall study alternatives to landfilling hazardous wastes including prevention, reduction, treatment, incineration and recycling. The Commission shall also study the issue of what can be placed in a hazardous waste landfill without posing a threat to the environment or to the health and safety of the general public. The Commission shall report to the 1984 Regular Session of the 1983 General Assembly by May 1, 1984. The report shall include any draft legislation necessary to carry out the recommendations of the Commission.

Sec. 3. Staff; meeting rooms. The Legislative Services Officer shall provide necessary professional and clerical assistance to the Commission. State departments, commissions, boards and agencies shall provide all professional and technical assistance requested by the Commission. The Commission may contract for assistance from non-State personnel as it deems necessary.

The Commission may hold its meetings in legislative buildings with the prior approval of the Legislative Services Commission.

Sec. 4. Subsistence and travel expenses. Members of the Commission who are also members of the General Assembly shall be paid subsistence and travel expenses at the rate set forth in G.S. 120-3.1. Members of the Commission who are officials or employees of the State shall receive travel allowances at the rate set forth in G.S. 138-6. All other members of the Commission shall be paid the per diem and allowances at the rates set forth in G.S. 138-5.

Sec. 5. Appropriation. There is appropriated from the General Fund to the General Assembly the sum of ten thousand dollars ($10,000) for the 1983-84 fiscal year to carry out the provisions of Sections 1 through 4 of this act.

Sec. 6. This act is effective upon ratification.

In the General Assembly read three times and ratified, this the 22nd day of July, 1983.

JAMES C. GREEN

James C. Green
President of the Senate

LISTON B. RAMSEY

Liston B. Ramsey
Speaker of the House of Representatives

APPENDIX D

GENERAL ASSEMBLY OF NORTH CAROLINA

SESSION 1983

RATIFIED BILL

RESOLUTION 54
SENATE JOINT RESOLUTION 653

A JOINT RESOLUTION AUTHORIZING THE LEGISLATIVE RESEARCH COMMISSION TO STUDY THE CREATION OF A POLLUTION PREVENTION PAYS RESEARCH CENTER IN NORTH CAROLINA.

Whereas, the safe management of hazardous and low-level radioactive wastes is one of North Carolina's most urgent problems; and

Whereas, the Waste Management Act of 1981 found and declared prevention, recycling, detoxification and reduction to be the waste management techniques which best protect human health and the environment; and

Whereas, pollution indicates waste, and several industries have saved resources, conserved energy and made more profit by preventing and reducing pollution; and

Whereas, North Carolina industrialists, engineers, scientists, citizens and regulators want to make Pollution Prevention Pay in North Carolina;

Now, therefore, be it resolved by the Senate, the House of Representatives concurring:

Section 1. The Legislative Research Commission is authorized to study the desirability and feasibility of creating a Pollution Prevention Pays Research Center in North Carolina. The study shall include an analysis of:

(1) the amount, availability and dissemination of technical information on technologies that prevent, reduce, recycle, treat, incinerate, detoxify and store hazardous and low-level radioactive waste;

(2) the research needed to help North Carolina industries prevent and reduce water and air pollution and the generation of hazardous and low-level radioactive wastes;

(3) the effectiveness and desirability of conducting Pollution Prevention Pays conferences for industry groups such as the two conferences for the electroplating and metalfinishing industry in April, 1983;

(4) the transfer of waste management technologies to North Carolina industries;

(5) how to effectively utilize the resources and expertise of the Governor's Waste Management Board, Board of Science and Technology, the Department of Commerce, Commission on Health Services, Department of Human Resources, Environmental Management Commission, Department of Natural Resources and Community Development, Pesticide Board, Department of Agriculture, industry, University of North Carolina system, private universities and colleges, community college and technical college system, industrial associations, professional groups and others; and

(6) the advantages and disadvantages of centralizing information, resources, and expertise in a Pollution Prevention

Pays Research Center or such other organizational arrangement as may seem appropriate.

Sec. 2. This resolution is effective upon ratification.

In the General Assembly read three times and ratified, this the 22nd day of July, 1983.

JAMES C. GREEN

James C. Green
President of the Senate

LISTON B. RAMSEY

Liston B. Ramsey
Speaker of the House of Representatives

APPENDIX E

Bibliography

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2. "Making Pollution Prevention Pay in North Carolina: Opportunity Challenge and Obligation" by Donald Huisingh, John Runkle and W. Lee Fleming; reprinted from "A Healthy Economy in a Healthy Environment", 1983 proceedings of the North Carolina Environmental Affairs Conference. 17 pages.

3. "Low or Non-Pollution Technology Through Pollution Prevention - An Overview", Prepared by 3M Company for the United Nations Environmental Programme. Office of Industry and the Environment. St. Paul, Minnesota. 35 pages.

4. "Positive Incentives for Pollution Control in North Carolina: A Policy Analysis" by Dr. Carlisle Ford Runge; prepared for the "Pollution Prevention Pays " Symposium, sponsored by the N. C. Governor's Waste Management Board, Winston Salem, N. C., May 26-27, 1982. 46 pages.

5. "1983-85 Board of Science and Technology Proposed Research and Education Program for Toxic and Hazardous Substances". 21 pages. And the Board's Fiscal Year 1984 Plan for the Pollution Prevention Pays program (with list of projects). 15 pages.

6. "Discussion Paper. Planning for Pollution Prevention: A Workshop to Determine Research and Education Activities To Support an Integrated Program". North Carolina Board of Science and Technology. 24 pages.