

**Case Studies held by
The Research Library for RCRA
U. S. Environmental Protection Agency, Region 1
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Contractors (Labat-Anderson, Inc.)**

The following annotations are for case studies held at the Research Library for RCRA. Entries in bold type are the subject locations at the Research Library. This list is not comprehensive. Pollution Prevention studies consist of half of the studies listed. Some case studies exist as parts of larger documents, few of which are included here. For further information about an individual case study, call us at (617) 573-9687. An index is provided at the back.

Subtitle D:

APARTMENT BUILDINGS

1. Challenge of Multi-Family Recycling
Written by James Wood, the Director of recycling at Vital Visions Corp. in Freeport, Florida. Discusses the challenges of a recycling program in multi-family housing. Studies how Okaloosa and Clearwater, Florida and Allentown, Pennsylvania approached the problem. The physical structure and management of multi-family complexes requires varying systems and approaches to waste management. (June 1991)

APARTMENT BUILDINGS-MASSACHUSETTS

2. Apartment Building Recycling: A Manual for Apartment Owners and Managers
Prepared by Resources Integration Systems Ltd. for the Division of Solid Waste Management DEQE of Massachusetts. The manual is a general guide for municipal DPW officials to explain how to overcome the barriers and implement workable apartment building recycling programs in Massachusetts. (May 1988)

ASH-ENVIRONMENTAL DEFENSE FUND

3. Environmental Defense Fund vs. City of Chicago
Environmental Defense Fund sued the city of Chicago saying that ash generated from incinerators of municipal resource recovery facilities was subject to regulation as hazardous waste. The Court of Appeals held that the ash generated from such incinerators is subject to regulations as hazardous waste under Subtitle C or RCRA. (1991)

[BOOKSHELF]

4. Making Less Garbage: A Planning Guide For Communities
Written and published by INFORM, a nonprofit research organization, looked around the country for successful source reduction efforts. The guide describes dozens of specific activities to reduce the amount and/or toxicity of solid waste that are being carried out in the states.

These activities include: government source reduction programs--[procurement and operations], institutional source reduction programs [in prisons, hospitals, and schools], government programs to stimulate source reduction action, business source reduction programs, education [for consumers and in schools], economic incentives and disincentives, regulatory measures, and programs aimed specifically at reducing toxics in the waste streams. (1992)

BUSINESS-WASTE

5. Waste Prevention Pays Off: Companies Cut Waste in the Workplace

By the US EPA. The booklet describes the successful waste prevention efforts of a large computer firm, a defense contractor, and ice cream company, and a variety of other businesses. While a program would be tailored to a specific company's needs, a great deal can be learned from other businesses experiences. (September 1993)

CFCS

6. Protecting the Ozone Layer: Safe Disposal of Home Appliances Containing Ozone Depleting Substances

The booklet, by the US EPA, is designed to serve as a practical tool for understanding the issue of safe disposal of ozone depleting substances and creating a national network for sharing ideas, solutions and resources. It includes an outline of the Clean Air Act requirements for disposal of appliances containing refrigerants, case studies highlighting existing or developing programs throughout the country, and an overview of the technical issues associated with refrigerant recovery. (July 1993)

CALIFORNIA-TEMECULA-RECYCLING-CASE STUDIES

7. City Responds to Recycling Mandate

Written by the Solid Waste Program Manager and City Manager of the city of Temecula, CA. It tells of the city's compliance with the California Assembly Bill [AB] 939 which mandated a 25% reduction in the amount of solid waste deposited in landfills by 1995 and 50% by the year 2000. (October 1992)

COMPOSTING-CASE STUDIES

8. US Solid Waste Composting Facility Profiles

Sponsored by the United States Conference of Mayors; the profile make cities aware of who is doing what in solid waste composting. The profile provides information about all operating facilities in the United States. (May 1992)

9. Proceedings National Extension Compost Utilization Conference, June 1993

Proceedings of a composting conference held in Minnesota. The topics discussed all aspects of composting, its use, and markets. Includes case studies on municipal & regional programs, facility design, on farm, yard waste, and

industrial waste composting.

COMPOSTING-FOOD PRODUCTION

10. Application of the Aerated Pile Method for Composting
Municipal Organic Refuse 1980 edition

The composting program was conceived as a means of generating needed topsoil for a large scale "greening" effort without the cost and adverse environmental effects of importing topsoil. The program was conducted in the South Bronx with grants from the National Center for Appropriate Technology, the Fund for the City of New York, the Jesse Smith Noyes Foundation and the Rockefeller Foundation.

COMPOSTING-MASSACHUSETTS

11. Bidding Procedures and Conflicting State Policies

The town of Nantucket, MA developed a privatized solid waste composting facility. But the town had violated the state procurement laws in selecting the developer of the project and the service contract if entered into by the Town would be null and void. (November 1989)

COMPOSTING-SEWAGE SLUDGE

12. Philadelphia's Composting Experiences

Written by the Philadelphia Water Department, the paper describes the steps taken by the City to end ocean dumping of sludge. The paper describes the plants used to compost the sludge and the process used to distribute the end product. (1980)

13. Overview of Compost Research Conducted by the Los Angeles County Sanitation District

The objective of this study, done by the Los Angeles County Sanitation Districts, was to improve the existing windrow composting system. The study also evaluated the aerated static pile process, and two mechanical systems: one enclosed and one not. (1980)

COMPOSTING-YARD WASTE

14. Leaf Composting Program

Describes the procedure used by Falls Township, Pennsylvania for leaf composting. It describes the collection methods, compost facility operations, processing and safety at the facility. (January 1990)

15. Yard Waste Composting: A Study of Eight Programs (EPA 1989)

Discusses high tech, mid tech, and low tech, programs in CA, MI, MO, MA, NB, WA, NJ, and MN.

16. Designing Yard Waste Composting Program

Summary of the report above. An EPA funded study characterizing eight yard waste composting programs in the U.S. to provide design options for these programs. The information provided represents a cross section of many

available options for designing yard waste composting programs." (Oct 1990, Waste Age)

CONTRACTS

17. Solid Waste Contract Negotiation Handbook

Prepared for the US EPA by the Bureau of Governmental Research at the University of Oregon. The case studies illustrate some of the diversity in solid waste agreements. The information in the studies is almost entirely from contract documents and can be used as a useful guideline. The cases are Benton County, Oregon issued a long-term franchise to the owner-operator of a landfill; Pierce County, Washington is similar to Benton County with special attention to tort liability matters in 1987 amendments; Dade County, Florida has a contract with a private firm for collection of recyclable materials. (May 1992)

CURBSIDE COLLECTION-MASSACHUSETTS

18. Curbside Collection of Recyclables: A Planning Guide

Written by Ferrand & Scheinberg Associates for Mass. Bureau of Solid Waste Disposal in 1985. The document provides assistance to Mass. municipalities interested in planning curbside recycling collection programs. The fourteen programs reviewed were selected because each illustrated the use of a different kind of vehicle collection system. (December 1985)

FINANCE-RESOURCE RECOVERY AND RECYCLING

19. Analysis and Financing of Recycling Based Businesses: Case Study Manual

Written by the National Development Council, the manual offers hypothetical scenarios with questions for the reader to answer to determine the best course of action. (June 1993)

HOSPITALS-WASTE

20. Hospital Pollution Prevention Case Study

In this study, the US EPA investigated the disposable used in patient care at the US Department of Veterans Affairs Cincinnati Hospital and Fort Thomas Medical Center to identify future opportunities for minimizing solid waste. Since some hospital waste is similar for each hospital in the country, this report's findings are all reproducible. (August 1991)

HOUSEHOLD HAZARDOUS WASTE-COLLECTION

21. Household Hazardous Waste Management: A Manual for One-Day Community Collection Programs

Published by the EPA, the booklet includes two case studies. The first is of the Public Utilities Department in Raleigh, North Carolina. The Department began a program to educate the citizens of Raleigh about household hazardous waste and proper HHW management methods, and to collect HHW from the

residents and recycle some of the collected wastes. It did this through a one day Household Hazardous Waste collection day. The case discusses the publicity, type of waste collected, and funding and costs involved in the program. The second study is similar except for the location: Rochester, New York. (August 1993)

HOUSING

22. HUD Case Study: Phoenix, Arizona

Study of cost cutting measures in an Affordable Housing Demonstration project. Costs saved through changes in processing procedures and other requirements and using some building practices not normally followed. Not completely reproducible due to differing building codes in each community in the country. (1983)

INTEGRATED MANAGEMENT-SOLID WASTE

23. Systematic Approach for Landfill Siting: A Case Study

A short abstract on the guidelines (also included) in a systematic approach to screening and evaluating a suitable Class 1 landfill site. (January 1988)

INVESTMENT ALTERNATIVES

24. Resources From Waste and Self-Reliant Investment

Written in a book called Doing It Ourselves, by Larry Martin, the case studies give examples of private and public initiatives to recover and to recycle the resource value of waste.

The first study is of Jay Eaton, a recycling entrepreneur. He operates the Portage Recycling Center in Portage, Michigan. Eaton recycles newspaper, glass, cans, engine parts, motors, flowerpots, metals, cameras, books, wood, appliances, furniture, toys, tires, tools, and more. He has added seven years to the city's dump and the dump now salvages 20% of the trash brought to it.

The next group of studies briefly describe how recycling in Palo Alto, Cal., Peterborough, N.H., and all of New Jersey has saved the towns or state money on disposal costs.

A third group of cases tells of how Midwest Plastics, Eaglebrook Plastics, St. Jude Polymer, Inc. and Recycloplast, Inc. all have recycled plastics to make new products.

LANDFILLS-GENERAL

25. Geological Considerations in the Siting of a Sanitary Landfill, Ulster County, New York

Discusses the geological considerations to the proposed landfill site in Ulster County. The site was determined to be unacceptable as a landfill. The authors are geologists from a community college and state college in neighboring towns of the proposed landfill. (September 1985)

LANDFILLS-LINERS

26. Municipal Landfills Using Double Liners: Seven Case Studies
Studies of municipalities using double-lined landfilling. Each case tells the location, size, type of waste and method of double lining of each landfill. The study was done by the magazine Waste Age. Since double lining is becoming the standard each case is reproducible. (October 1985)

LAWS AND LEGISLATION-GENERAL-ENVIRONMENTAL PERMITS

27. Environmental Permitting For A Source Recovery Facility: A Strategic Overview and Case Study Analysis
Illustrates the variability of permitting scenarios that are encountered for resource recovery facilities. Three regulatory frameworks are used: [1] Coordinated Environmental Impact Statement [EIS] and Permit Review with Provision for Scoping, [2] Coordinated EIS and Permit Review with Blanket Application of Regulations, and [3] Operating Permit Format with No EIS Requirement. Since each state has its own regulations regarding Source Recovery Facilities, the case study is more a guideline for in-state permitting in CT, MA, and PA. Study was done by ERT - A Resource Engineering Company.

LEAD-BATTERIES

28. Automobile Workers vs. Johnson Controls, March 20, 1991
A summary of a court case against Johnson Controls for their policy that no women capable of child bearing could have a job where the level from exposed lead in the woman's blood was above the OSHA limit. Automobile Workers said it was discriminatory. Initially the courts sided for Johnson Controls but the decision was overturned.

MINIMIZATION, WASTE

29. Case for Stopping Wastes at Their Source
An article from Environment magazine telling what companies, states, and people can do to reduce waste. The case study involves a plumbing product company, Stanadyne, and how it reduced waste generation by 46% with \$20,000 per year cost savings. (April, 1986)
30. Waste Reduction Through Material and Process Substitutions: Progress and Problems Encountered in Industrial Implementation.
Published in Hazardous Waste & Hazardous Materials, Vol. 4, #1, 1987 by Lisa Gardner, et. al., this article presents a case of the minimization of chlorinated caustic or acidic cleaners and degreasers in industry. Also presents cases of substituting for toxic metals and replacement of inks, paints, and solvents with aqueous substitutes. National, and local, large and small firms were surveyed.

MUNICIPAL WASTE-ECONOMICS-CHICAGO

31. Economics of Municipal Solid Waste Management: The Chicago Case

Using Chicago as an example, the US EPA tried to determine those factors affecting residential solid waste. Though somewhat dated, the study surveyed race, household size, income, and solid waste distribution. (August, 1978)

OIL SPILLS-CONTAMINATION

32. Oil and Water Don't Mix

Written by a commercial firm, the report describes the problem of organic contaminants in groundwater from oil dumping, the solution used, and a list of 11 sites that have organic contamination in groundwater. (1990)

PACKAGING-SOURCE REDUCTION-ECONOMICS

33. Factoring the Value of Source Reduction into Packaging Use/Post Use Economics

Using 9 communities of varied size and demography an analysis was made to determine the total cost of packaging of a product (including recycling) using aluminum, glass, plastics, and steel. Conducted by the American Plastic Council. (1990)

PAINT

34. Paint Recycling: A Case Study

Arnold Hoffman, employed by Major Paint Co., describes how the firm converted its wash water residue and plant call-backs into a new product thereby declassifying the company as a hazardous waste generator. Also describes a program for communities in California to collect latex paint and incorporate used paint into new product. (November, 1990)

PLASTICS-CASE STUDIES

35. The Borough of the Bronx, NY

36. Town of Islip, Suffolk County, NY

37. Town of North Hempstead, Nassau County, NY

38. City of Philadelphia, PA

39. Hilton Head Island, SC

40. Chicago Park District, IL

41. Hennepin County, MN

42. USS Lexington (ATV-16), Pensacola, FL

43. East Rockaway Public Schools, Nassau County, NY

44. Walnut Creek, CA

Each case study above, conducted by The Council for Solid Waste Solutions (i.e. the plastics industry) discusses how each community dealt with the issue of plastic recycling and the action that the Council took to accomplish the program. End results reported.

PLASTICS-RECYCLING-FILM-ECONOMICS

45. Closing The Loop

Written by Rubbermaid, describes how the company uses post-consumer plastic waste in the production of its products. Tells how the firm is able to compete with virgin plastic when using LDPE stretch wrap as the raw material. (1992)

PLASTICS-RECYCLING-HOW TO

46. Plastics in the Municipal Solid Waste Stream

Case studies of strategies communities and firms and associations have used to reduce and recycle plastics. It includes the Council of Northeast Governors (CONEG) strategy to minimize toxics in packaging; Newark, NJ source reduction activities; Rubbermaid remanufacturing of super-market and restaurant plastics; Minneapolis' threat to ban plastics landfilling which forced industry to reduce plastic wastes. Also includes a review of German actions involving producer-pays legislation for managing packaging wastes. (1992)

POLLUTION PREVENTION

47. Research Library for RCRA Subject Holdings

The literature of Pollution Prevention has, until the present (December, 1993) been largely built on case studies. We at Region 1 have dozens of these case studies in subject files and publication files. Noteworthy are case studies done by the Tufts University "Center for Environmental Management" with large national firms. Also we have studies on the following industries and subjects:

Air Conditioning	Biotechnology	Chemicals
Cleaning	Cosmetics	Computer
Construction Industry		Dairy
Drycleaning	Dyeing	Electrical
Farms	Hospitals	Jewelry
Junkyards	Laboratories	Leather
Metals	Motors	Oil
Motor Vehicles	Service Stations	Paint
Paint Removal	Paper	Pesticides
Photography	Plastics	Printing
Refrigeration	Schools	Semiconductors
Service Industries	Solvents	Textiles
Transportation	Wood	

These are some specific holdings. However, should you require a Pollution Prevention subject or industry case study not listed, do contact us. We are aware of many held by the Pollution Prevention Section of US EPA Region 1, by the Northeast Waste Management Officials Association (NEWMOA), and by the Pollution Prevention and toxics reduction divisions of many Northeast states environmental agencies.

48. Profits From Pollution Prevention

Written by the Pollution Probe Foundation, and sponsored by Ontario Ministry of the Environment and other Canadian agencies and firms, this is a book length guide describing how a company can develop a program for waste reduction. It also describes a variety of technologies used in waste reduction in metals plating, photography supplies manufacturing, metals cleaning, the newspaper industry, and chemicals industry. (1990)

49. Pollution Prevention Research Branch: Current Projects

Briefly describes the 41 Pollution Prevention projects that were supported by the US EPA in FY 1991.

POLLUTION PREVENTION - 1,1,1 TRICHLOROETHANE BY AQUEOUS SUBSTITUTION

50. Toxics Use Reduction Case Study

Conducted by a Massachusetts agency's technical assistance staff, two firms implemented chemical substitutions and process changes which completely eliminated the need for this highly toxic material.

POLLUTION PREVENTION-CASE STUDIES

Ohio Pollution Prevention Case Studies for Non-Hazardous Industrial and Commercial Waste

The 25 case studies published by the Ohio EPA were all voluntarily provided by facility contacts. The studies document the efforts of Ohio companies to overcome barriers in implementing non-hazardous Pollution Prevention programs.

Each study provides the following standard descriptors:

Project Name	SIC Code	Products Manufactured
Name of Firm	Location	Contact Person
# Employees	Clean Technology	Category
Project Summary	Economics	Benefits
Obstacles	Problems	Date
Contacts	Citations	Keywords

The cases studied [all in Ohio]:

51] O. M. Scott & Sons Co, Marysville, reduced ammonia emissions in their fertilizer manufacturing plant by 67% since 1987. They manufactured products without phosphorus as was possible, using it as an additive after drying which generated 33-80% less ammonia.

52] Omega Pultrusions, Aurora, manufacturer of reinforced plastic parts reduced plastic scrap by 28% in a single year by implementing management controls over production and empowering employee decision-making.

53] Neo-Wood Products, Tiffin, turned byproducts from wood machining into raw materials for a new division.

54] Northeast Ohio Regional Sewer District conducted a pollution prevention seminar for the radiator repair industry.

55] The Garber Co., Ashland, converted from an internal laundry service to an outside contractor eliminating pollutants previously discharged into sewers from laundering rags.

56] Franklin Boxboard Corp., Franklin, reduced the amount of waste water it produced and fresh water used in production. Results achieved by modifying the process and equipment in the pretreatment area.

57] American Electric Power, Columbus, promoted the use of coal ash with a marketing and business plan that identified new applications for the ash.

58] Mercy Medical Center, Springfield, started a recycling program for paper, corrugated, tin, steel, aluminum, and glass. As pollution prevention this is questionable.

59] Summa Health System, Akron, implemented a program that decreased biomedical wastes, recycled items from x-ray processes, and reused medical equipment.

60] Miami Mill, West Carrollton, developed and applied deinking technology to produce 210 tons per day of recovered paper utilized in the remanufacture of specialty printing products and paper products. The deinking facility was upgraded three times: 1975, 1990, and 1992.

61] Terramat Corp., Youngstown, developed and patented a method of recycling scrap truck tires into portable road mats used in the logging, mining, construction, railroad transportation, oil, and gas industries.

62] Union Spring & Manufacturing Corp., Chillicothe, implemented a system for collecting nonhazardous waste for remanufacturing. The wastes collected from steel-making processes included dusts, scales, and scrap.

63] Campbell Soup Company, Napoleon, created a new reclamation system for condemned products including tin, glass, aluminum, and vegetables. The vegetables are dried and sold as an animal feed supplement.

64] Columbia Gas Distribution Companies, Columbus, started a recycling program.

65] PMI Food Equipment Group, Hillsboro, recycles raw material scrap cardboard, wood skids, coolant, cutting oil, oil filters, banding material, and empty drums.

66] F. E. Myers Company, Ashland, has an ongoing pollution prevention program that has so far focused on recycling and energy conservation. A compactor separates and compacts corrugated. Myers remanufactures time cards, data processing paper, white paper. Myers separates and sells materials for recycling including steel, brass chips, aluminum chips. Wood skids are returned for reuse; cast iron scrap is melted for reuse in the company foundry. Myers is looking for a use for foundry sand, 95% of which is nonhazardous.

67] Dow Chemical, Findley, started a waste reduction program for scrap cores, scrap metal, film, steel bands, endplates, and packaging materials.

68] Hedstrom Corp., Ashland, started waste reduction in maintenance operations, housekeeping, and training. The firm also improved manufacturing processes in the manufacture of vinyl, rubber, and latex.

69] Ohio Electric Control, Ashland, saves corrugated cartons it receives for reuse and recycles packaging materials. It also salvages metal wastes for recycling.

70] Monsanto Corp., Addyston, began a plant-wide program to segregate pallets, plastics, metals for recycling and reuse in manufacturing. Employee involvement programs recycle household items from domestic use: even if the waste is generated at home, employees bring it to Monsanto for reuse or recycling.

71] Northeast Ohio Regional Sewer District, Cleveland, implemented a comprehensive recycling program for all of the most common contents of municipal solid waste, as well as for lead-acid batteries, wood, used oil which were generated both in company facilities and in employees homes.

72] Stone Container Corp, Coshocton, recovered all paper at its plant for recycling. The firm used all wood waste for fuel in an energy recovery boiler, collected scrap metal and sold it to local scrap dealers. Waste water sludge (mainly wood fiber and biomass) was utilized as fuel as well. Wood ash from the boiler is marketed to farms as an agricultural supplement.

73] GE Superabrasives, Worthington initiated a recycling program for glass, aluminum, corrugated, plastics, aluminum, steel, and paper. Additionally, graphite dust, is sold for reuse after processing from ceramic dust.

74] Crown Equipment, New Bremen, has a solid waste reduction program for its 6 manufacturing plants and 2 office buildings. Its reduction program implemented the reuse of plastic injection molding scrap, coolant recycling in-house, reuse of cutting fluids, in-house reuse of styrofoam packing materials, waste wood and wood pallet reuse and recycling, shot blast dust recycling, and reclamation of other scrap.

75] Ball Metal Beer and Beverage Container, Finlay, started an aluminum recycling and waste minimization program for multimaterials via material, product, and process substitutions, training, and housekeeping.

Pollution Prevention Case Studies in Ohio's Lake Erie Basin
Using the same format as the document above, this document studies 31 cases. (September, 1992). The cases are:

76] Adelphia, Inc., Cleveland, implemented a paint process modification to change from solvent based to water based paint, reducing air emissions, and a nonhazardous water-based cleaner for degreasing.

77] Air Products & Chemicals, Inc., Cleveland, changed the direction of batch process seal pot water used in vinyl acetate polymerization from a local, publicly owned treatment works to a continuous process for raw material feed stocks where the vinyl acetate is converted to a saleable product.

78] Automatic Welding and Manufacturing, Ashland, a 'job-shop' fabricator updated their paint guns to airless guns and substituted high solids paints to reduce hazardous waste generation. They also recycle and reuse all paint thinners onsite.

79] BP Chemicals, Inc., Lima, replaced an old facility with a new one to reduce air emissions by approximately 2,000 tons per year of NOx, and recovered nitrogen oxides, turning them into a saleable product in its nitric acid production process.

80] City Machine and Wheel Co., Stow, changed a conventional wet paint coating operation to a dry powder and a state-of-the-art coating system, eliminating hazardous waste of 85,100 lbs per year. The majority of operations in which this was done were in welding, painting, and tire mounting on wheels for lawn/garden and recreational vehicles.

81] Cleveland Wood Products, Cleveland, makers of brushes for the vacuum cleaner industry, reduced volatile organic compound (VOC) emissions from their painting operations by changing from an electrostatic lacquer system that was mixed on-site to an enamel pre-mixed spray system. The firm later used water-based paint, reducing emissions in other processes.

82] Copeland Corporation, Wapakoneta, replaced 1,1,1, tri-chloroethane cleaning solvent with a petroleum-based product and also replaced xylene-based paint with powder coating, eliminating liability from handling, storage, and disposal of paint-related wastes. Fumes, too have been eliminated. The waste from the petroleum product is reused in the manufacture of new fuel. This firm remanufactures and assembles compressors for residential air-conditioning.

83] Crown Equipment Corp., New Bremen, replaced 1,1,1 tri-chloroethane with an aqueous cleaning solution in its cold cleaning degreasing and vapor degreasing operations.

84] Diebold, Inc., Canton, reduced the use of solvents through paint substitution. They participated in US EPA's 33/50 program.

85] Dietrich Industries, Inc., Warren, a metal fabricating and steel processing facility, mechanically modified a washer and now uses ultrafiltration technology to decrease hazardous wastes and chemicals.

86] Eveready Battery Company, Fremont, implemented process and equipment modifications to reduce the amount of solvents used and eliminated 1,1,1 trichloroethane from a labeling adhesive with a water-based adhesive.

87] General Metals Powder Co., Akron, installed ion exchange columns and modified their regenerating process so as to concentrate and reuse copper laden rinse waters. The new process requires more water and chemicals to de-ionize water. It also requires more electricity than the older process, but the firm is now in compliance with its sewer use permit and does not generate any hazardous waste.

88] Gerity-Schultz Corp., Toledo, substituted synthetic oil for soluble oil in its quench pits. The synthetic oil is used in zinc die-casting resulting in a large reduction of disposable waste.

89] Gerity-Schultz Corp., Toledo had another project which substituted ethylene glycol (the major component of anti-freeze) with diethylene glycol as a hydraulic fluid for a reduction in the production of toxic materials.

90] Guardian Automotive Products, Upper Sandusky, replaced 1,1,1, trichloroethane with a solvent which has a lower evaporation rate and is more environmentally friendly in manufacturing laminated windshields.

91] Kovatch Casting Sompany, Uniontown, reduced the use and emissions of 1,1,1 trichloroethane through improved house-keeping. The solvent still in use is reclaimed off-site and reused by a ferrous and non-ferrous investment foundry.

92] The Lincoln Electric Company, Cleveland, manufacturers of arc welding products and industrial motors, reduced the quantity of 1,1,1 trichloroethane used in paints, coatings, and metal cleaning operations through material substitutions. It has also reduced the releases of barium compounds. Modification of processing allowed the capture and reuse of manganese ore. Also an ion-exchanger strips copper from plating streams for sale to a copper reclaimer.

93] Luke Engineering & Manufacturing Company, Wadsworth, is reducing and eventually will eliminate the use of 1,1,1 trichloroethane by replacing it with biodegradable, water-based alkaline cleaners in its aluminium finishing plant.

94] Manufacturers Enameling Corp., Toledo, converted all painting jobs from liquid to powder paint.

95] Neo-Wood Products, Tiffin, a wood furniture manufacturer redissolves nitrocellulose lacquer overspray dust on a lacquer thinner solvent blend for reclamation and reuse. This enhances housekeeping and fire safety.

96] Perfection Finishers, Inc., Wauseon, eliminated the use of 1,1,1 trichloroethane as a degreaser, changing to a citrus-based cleaning compound made from orange peels in its plating, painting, finishing, and decorating of glass plastic, and metal.

97] Plasticolors, Inc., Ashtabula, manufacturer of dispersions, additives, and colorants, implemented a waste minimization program that reduced waste generation by 43% during its first year. The reduced wastes were chiefly resins. The firm additionally participated in recycling office paper and corrugated.

98] PPG Industries, Cleveland, uses an ultrafiltration/reverse osmosis process water reclamation unit to reclaim cleaning water for reuse in production cleaning of automotive coatings. The firm also has installed water-based topcoats and primers for solvent based topcoats.

99] Premix, Inc., North Kingsville, created a solvent replacement task force to make substitutions that are less hazardous. It also investigated substitutions for its thermoset molding compounds.

100] Republic Engineered Steels, Inc., Canton eliminated waste streams containing 1,1,1 trichloroethane by modifying processes and equipment in manufacturing high quality bar steel and specialty steels.

101] Textileather Corp., Toledo, makers of vinyl coated fabrics and film analyzed excess cleaning oil, reducing its solids level. The processed oil is filtered and sold to a client.

102] Ultra Forge, Inc., Cuyahoga Falls, completely removed 1,1,1 trichloroethane and tetrachloroethylene from its manufacturing facilities by installing spray wash equipment and by using alkaline-based solutions in its production of aluminum wheels and hubs for trucks.

103] Van Dorn Plastic Machinery Company, Strongsville, eliminated the use of chlorinated solvents for a cleaning operation by substituting an alkaline soap solution that is applied by a steam cleaner for cleaning of plastic injection molding machines.

104] Walbridge Coating Company, Walbridge, implemented a metal recovery and sludge recycling plan to reduce the amount of hazardous waste generated. An electro-galvanizing facility recovered zinc and nickel sulfate from waste water streams and generated a commercially useable by-product for modifying equipment and processes.

105] Whirlpool Corp, Marion Division, Marion, a metal finishing appliance manufacturing facility implemented a variety of source reduction activities to reduce emissions, avoid disposal costs and create safer working environments. It installed new paint guns to reduce paint and emissions, a cleaner regeneration system to reduce the amount of cleaners used, and changing to cathodic paint from anodic electrostatic painting to eliminate ketones.

106] York International Corp., Elyria reduced emissions by 90% over 4 years through process modifications and materials substitutions to its heating and air conditioning manufacturing operations.

POLLUTION PREVENTION-DIRECTORIES

107. Waste Minimization Issues and Options

Study by Versar, Inc. and Jacobs Engineering Group for the US EPA's Waste Treatment Branch lists 115 companies, the product the company makes, a description of the waste minimization method used, the percent and quantity of waste reduction, SIC Code, number of employees, project objective, capital investment, annual cost savings, and payback period for each entry. (October, 1986)

POLLUTION PREVENTION-EPA-PUBLIC INFORMATION

108. Three Case Studies: An Introduction

In EPA Journal, July/September, 1993 the entire issue is devoted in Pollution Prevention. These case studies discuss the results at 3 companies, Xerox Corporation, Borden Chemical Company, and Hyde Manufacturing Company. Rather than simply complying with environmental regulations each firm took steps to reduce pollution at the source.

POLLUTION PREVENTION-FREON BY NITROGEN

109. Toxics Use Reduction Case Study: VOC and Freon Reduction at Galileo Electro-Optics Corp.

A study by the State of Massachusetts describes how the Sturbridge, MA firm substituted chemicals in its production and quality inspection areas to reduce VOCs. Trichloroethylene usage and emissions were reduced by 95% by recycling freon in-process, and emissions were reduced by 60%.

POLLUTION PREVENTION-LABORATORIES

110. Laboratory Waste Disposal: Five Cases of Model Practices

This study is in an article in Pollution Engineering by a consultant to laboratories which characterizes 5 successful lab waste management programs that can be used as models for other facilities. Covers a variety of lab situations. (April, 1985)

POLLUTION PREVENTION-SOLVENTS

111. Toxics Use Reduction: Case Study

Done by the Office of Technical Assistance in the Executive Office of Environmental Affairs for the State of Massachusetts. It is a summary of Kilmartin Tool Co. The company devised a method for minimizing CFC losses. The change permitted the company to reduce its use of CFC by 80%.

PROCUREMENT-BIDS

112. BidTRAX Best Buys Report and User Guide for Sample City, California

The package five Best Buys Reports is custom designed to each municipality. These reports tell how well the municipality is doing and how the municipality can potentially do better. The five reports are: [1] Municipality Overview: Price, [2] Municipality Overview: Volume, [3] National Category Detail, [4] Regional Category Detail and List of Participating Cities in Your Region, and [5] Peer Category Detail. The reports present data for six product categories: copy and bond paper, computer paper, paper towels, film, auto and van tires, water/waste water treatment chemicals.

PUBLICATIONS

113. About Recycling: Case Studies from Europe

Case studies concerning the industrial remanufacture of municipal solid wastes from the previous issues of the WARMER Bulletin. (UK) The document is of especial interest since it talks about cases of recycling throughout Europe for nonferrous metals, glass, paper, plastics, as well as tires, industrial chemicals, industrial wastes, and toxic materials. (1992)

114. Austria Recycles

The case of utilizing an optical scanning system for separating plastics in an MRF in Austria, utilizing a Swedish company's technology, results in a 93% separated waste stream.

115. Assessment of Wet Systems for Residential Refuse Collection An older document by US EPA evaluates the potential applications of wet system for residential refuse collection in a case study of Springfield, MA. (August, 1974)

116. Charging Housholds for Waste Collection and Disposal: The Effects of Weight- or Volume-Based Pricing on Solid Waste Management

Prepared for the US EPA, three case studies were conducted to determine the role of unit pricing in municipal solid waste generation and disposal. The three towns were Perkasio, Pennsylvania; Ilion, New York (both small suburban communities), and Seattle, Washington. All three

communities had to have a mandatory unit pricing program, available existing data, a recycling program, and community and program variations to be considered for the case studies. (September 1990)

117. Foreign Practices in Hazardous Waste Minimization. (1986)
In a report to the US EPA, three faculty members of a Tufts University Center for Environmental Management provide case studies of hazardous waste minimization. The report looks at both policy-creation, government support for waste minimization in the form of grants, loans, tax breaks, and technical assistance to industry and municipal government in Japan, Canada, Germany, Sweden, the Netherlands, and Denmark. It also goes into how the most troublesome waste streams in the Netherlands, Denmark and Sweden have been minimized or have planned to minimize. The report considers industrial waste streams, agricultural waste streams, mining, fishing, construction, wholesale and retail trade & MSW. Hazardous wastes that were given particular attention were:

- oil
- solvents
- paints
- adhesives
- acidic/alkaline wastes
- cadmium, mercury antimony, arsenic, barium, beryllium, lead, cobalt, copper, chromium, nickel, selenium, silver, thallium, tin, vanadium, and zinc
- cyanide containing waste
- PCB containing wastes
- Pesticide containing wastes
- Chemicals
- Laboratory wastes

118. Public Private Partnership: Case Studies: Profiles of Success in Providing Environmental Services
The report, done by the US EPA, examines 23 case studies of public-private partnerships throughout the US. They are organized into three areas: solid waste, wastewater treatment, and drinking water. Topics covered in each study included characteristics of the community and the project, public decision-making process in the selection of a private partner, financing responsibilities of the private partner and the public, procurement arrangement used to secure private involvement, division of responsibilities for project implementation, description of how project was implemented, evaluation of project success, lessons learned, and contact information. (September 1989)

119. Industrial Waste and Pretreatment in the Buffalo Municipal System

The objectives of the study done by the US EPA were to establish an industrial waste control program, to establish an equitable cost recovery and user charge system, and to evaluate the effects of the local, state and federal requirements on the industrial users of Buffalo's sewage system. (January 1977)

120. Resource Recovery Planning Model: A New Tool For Solid Waste Management

Published by the US Department of Commerce/National Bureau of Standards. A case study of a hypothetical region is used to carefully illustrate the types of analysis which can be performed by RRPLAN (Resource Recovery Planning Model). Once the user has worked through the study, they should be able to handle a variety of solid waste management problems. (July 1983)

[The following "Guides" were commissioned by the California Department of Health Services and published by the US EPA]

121. Guide to Pollution Prevention: The Commercial Printing Industry

The waste minimization assessment studies used two printing plants. Plant A was a medium sized commercial printer handling a wide range of commercial printing, including advertising inserts, business forms, brochures, pamphlets, and circular. Plant B was a large scale printing operation with several plants printing circular and advertising inserts for many major and minor newspapers in Southern California. (August 1990)

122. Guide to Pollution Prevention: The Fabricated Metal Products Industry

Plant selection emphasized small businesses which generally lack the financial and/or internal technical resources to perform a waste reduction audit. One relatively large plant was selected to offer the opportunity to evaluate a wide variety of operations, as well as a number of in-place waste reduction measures. Plant A manufactured metal laboratory furniture. Its operations included sheet metal cutting, shearing, notching, punching, forming, cleaning, welding, and painting. Plant B (the large plant) performed contract work for aerospace companies, computer firms and other businesses. The shop specialized in high quality, close tolerance work, using all types of metal. Plant C was a decorative chrome electroplating shop. (July 1990)

123. Guide to Pollution Prevention: The Printed Circuit Board Manufacturing Industry

The waste minimization assessment for all three plants followed the same protocol which included: planning and organization, assessment phase, and feasibility analysis phase. All three plants were prototype circuit board manufacturers that specialized in jobs involving limited production and fast turnaround. Manufacturing operations included drilling and routing, layering, photoresist printing, plating, etching, and stripping. (June 1990)

124. Guide to Pollution Prevention: The Paint Manufacturing Industry

The waste minimization assessments were concerned with waste generated within the plant boundaries and not with waste derived from paint application or disposal of painted parts or stripped paint. Plant A produced water-based architectural coating and Plant B produced solvent-based industrial coatings. (June 1990)

125. Guide to Pollution Prevention: The Pesticide Formulating Industry

The objectives of these studies were to gather site-specific information concerning the generation, handling, storage, treatment, and disposal of hazardous waste, evaluate existing waste reduction practices, develop recommendations for waste reduction through source control, treatment, and recycling techniques, and assess costs/benefits of existing and recommended waste reduction techniques. The two plants studied were [1] a plant mainly formulating granule and dust fertilizers, as well as, three herbicide/fertilizer mixtures in dust/granule form and [2] a plant mainly engaging in the formulation and distribution of solid fertilizer, as well as, formulating small quantities of liquid fertilizers. (February 1990)

126. Guide to Pollution Prevention: Metal Casting and Heat Treating Industry

The three studies summarize not only waste reduction alternatives, but also treatment alternatives that would lead to sludge and waste water reduction. The three plants were [A] a brass foundry that manufactures cast brass plumbing fixtures. The raw materials for the brass operations come mainly from recycled automobile radiators. Plant B is a commercial heat treating plant designed for handling ferrous and non ferrous metal workpieces. And plant C is an iron foundry that manufactures gray, ductile, and alloy iron castings from scrap iron including scrap engines. (September 1992)

127. Guide to Pollution Prevention: The Metal Finishing Industry
The comprehensive study views the finishing plant as a single system and identifies the relationships between material usage, production processes, and waste generation. The three shops studied were: [A] a manufacturing operation which included plating, anodizing, stripping, etching, cleaning, tooling, and other finishing processes using both manual and automated process lines operating 8 hours a day, [B] same as plant A but that all processes are manual operating 24 hours a day, and [C] specializes in zinc plating and anodizing operating 2 and sometimes 3 eight hour shifts per day. (October 1992)

128. Guide to Pollution Prevention: The Mechanical Equipment Repair Industry

The guide provides the mechanical equipment repair industry with waste minimization options. The 12 studies conduct assessments to determine waste minimization alternatives. The shops studied were two boiler repair shops, an appliance repair shop, a lawnmower repair shop, two air conditioning repair shops, two electric motor repair shops, a tool repair shop, a millright repair shop and a rental repair shop. (September 1992)

129. Guide to Pollution Prevention: The Marine Maintenance and Repair Industry

The guide is designed to provide marine maintenance and repair yards with waste minimization options appropriate for the industry. The case studies are summary results of the assessments of three marineyards and the potentially useful waste minimization options identified through the assessments. (October 1991)

130. WARMER Bulletin, November 1993

Articles throughout the magazine on a variety of topics. An Italian city Prato tries alternative collection method for recyclables, the Body Shop sets standards for environmental management and sustainable development, recycling in Bangalore, India managed by ragpickers, and composting in Britain and America and new facility in Germany.

PROCEEDINGS FOR FIRST UNITED STATES CONFERENCE ON MSW MANAGEMENT (June 1990)

131. Seattle: A Case Study in Integrated Planning

Three years earlier, the Seattle Solid Waste Utility was in chaos and economic crisis. By 1990, it was leading the nation in recycling. The study tells how garbage became one of the top four public issues in the Puget Sound region and how the experience can be duplicated by other cities.

132. Municipal Solid Waste: Composting in West Germany: Three Case Studies

The paper is a presentation of a fact finding tour in 1989 by Camp Dresser & McKee Inc. of three municipal solid waste composting plants in West Germany [Duisburg, Aurich, and Bad Kreuznach]. The plants produced three basic output streams: compost, recyclables, and residue. It points out a number of important factors to consider when evaluating a solid waste composting plant: composition of incoming waste, recovery of non-compostable recyclables, end uses of the compost product, and residue and reject disposal.

133. Urban Landfill Siting Studies: A Case History

The Department of Environmental Protection for Montgomery (County) Maryland discusses the process the county went through in choosing a site for a new landfill to serve its 700,000+ residents.

PYROLYSIS-CASES

134. San Diego County Demonstrates Pyrolysis of Solid Waste
Sponsored mainly by the US EPA and Garrett Research and Development Company of LaVerne, California, this paper describes the process Garrett developed for pyrolysis of solid waste. (1975)

135. Scrap Tire Pyrolysis

Describes the process of tire pyrolysis using Conrad Industries Inc. in Centralia, Washington as the example. Describes various types of pyrolysis reactors. Not completely reproducible since the plant had no pollution controls and had no local regulations applying to the facility. The type of reactor used was not mentioned. The paper was done by the US EPA Control Technology Center. (December 1991)

136. Low Temperature Pyrolysis of PVC Backed Carpet Waste

This paper, done by Eindhoven University of Technology Department of Chemical Technology, discusses the question of using low temperature pyrolysis on PVC backed carpet waste to make fuel. The project was carried out under contract by the European community. A spoutfluid reactor was used. Being strictly experimental, the process is reproducible. The experiment was not a success because the end product, tar, contains chlorine at unsafe environmental values. (1985)

137. Pyrolysis as a Means of Recycling Thermoset Composites

Sponsored by the SMC Automotive Alliance and the SPI Composites Institute, this paper talks about the general feasibility of a pyrolysis process on the non-metallic content of automobiles. (February 1991)

138. Kinetic Studies of Primary Pyrolysis of Municipal Solid Waste in a Pyroprobe 1000
This paper is about the quantity of products yielded by municipal solid waste at incremental temperature changes. (1992)

RECYCLING-CONNECTICUT-PUBLIC INFORMATION

139. Recycling in East Lyme, Connecticut: A Program That Works
Written by the Department of Environmental Protection of Connecticut. East Lyme was the first town in the State to reach the state's goal of 25% reclamation of the waste stream through recycling. The paper describes the steps taken by the town to reach its goal. (1988)

RECYCLING-ENERGY-SAVINGS

140. Municipal Solid Waste and Energy Recovery
Presented by the Institute for Recyclable Materials at Louisiana State University funded by the Petroleum Violation Escrow account funds approved by the Department of Energy. In all there are nine case scenarios. The reference case assumes 100% recycling of all MSW material that can be recycled; the Most Likely case assumes a 25% across the board recycling and 100% exclusion of yard wastes from landfills; the Maximum Btu Recovery case assumes a 25% reduction in landfill utilization: components were then chosen based upon relative energy savings to maximize total energy recovery through recycling; a Minimize Landfill Utilization case also assumes a 25% reduction for the first year: components were chosen based upon volume to weight ratio to minimize landfill utilization rates. Another group of scenarios was made similar to the those above but included the potential impact of plastic incineration. And the last case scenario is where yard waste is excluded, aluminum is 100% recovered and a large percentage of plastic is incinerated. (April 1991)

RECYCLING-HOW-TO-PUBLIC INFORMATION

141. Promoting A Municipal Recycling Program
Compiled by International City Manager's Association (ICMA) Environmental Programs, the packet shows how Seattle, WA, Takoma Park, MD, Modesto, CA, Dakota County, MN, Prairie Village, KS, and Homewood, IL promoted and educated their residents about recycling. (January 1990)
142. Recycling Solid Waste
MIS Report by ICMA introduces the idea of an integrated approach to waste management and describes the components of a successful recycling program. The towns discussed are Newark, NJ, South Berwick, ME, and San Jose, CA. (June 1989)

RECYCLING-MASSACHUSETTS-CASE STUDIES

143. Longmeadow, Massachusetts Recycling Program

144. Suggested Reading

A Massachusetts Department of Environmental Protection publication listing to assist in planning and implementing composting and recycling in a community and region includes case studies.

RECYCLING-MASSACHUSETTS-MUNICIPALITIES

145. Phase One Needs Analysis for the Millis Consortium

Sponsored by the Mass DEP and prepared by Alternative Resources, Inc. The report describes the results of the Phase One Needs Analysis with the purpose being to assess collection and processing options, and to determine the most cost-effective and appropriate mix of recycling facilities and services needed for the implementation of recycling. (February 1991)

RECYCLING-NEW YORK

146. Intensive Recycling Feasibility Study for the City of Buffalo, 1988

Under contract by the Common Council of the City of Buffalo and Citizen Action-New York, the Center for the Biology of Natural Systems (CANS) studied the feasibility of applying the CANS Intensive Recycling System to the disposal of Buffalo's household trash. Currently, Buffalo's trash disposal system is based on collection of unseparated trash from households and brought to a transfer station. The proposed plan is to provide four containers; three for recyclables and one for non-recyclables. (April 1988)

RECYCLING-RHODE ISLAND-COMMERCIAL SOLID WASTE

147. Mandatory Commercial Solid Waste Recycling: Rhode Island Case Study

The study was conducted by Brown University's Center for Environmental Studies and the Rhode Island Department of Environmental Management with funding provided by the US EPA and DEM. The report discusses the findings of Rhode Island's mandatory commercial recycling program and makes recommendations for improving on it. (September 1992)

RECYCLING-RURAL

148. Case Studies in Rural Solid Waste Recycling: The Minnesota Project, November 1987

Prepared by the Ford Foundation for the Minnesota Project. Cases include collection, and creating economic incentives to recycle from WI, MI, CA, NH, and ME. (November 1987)

149. A Case Study of a Rural Recycling Marketing Cooperative Sponsored by the Tennessee Valley Authority Regional Waste Management Department and the EPA Region VI Office of Municipal Solid Waste. By pooling recovered materials processed to market specifications, rural recyclers can compete for better markets and higher prices for their materials. This report describes such a project formed by the Recycling Services Institute, Inc. over a three year period. The study discusses the development, community interest, legal structure, service area, start-up, operation, collection, processing, labor, marketing, finances, communications and lessons learned of the project. (June 1993)
150. Rural and Small Town Recycling: Annotated Bibliography A publication of the National Recycling Coalition in cooperation with the National Soft Drink Association. An annotated bibliography of case studies, reports and papers on rural and small town recycling. (September 1991)

RECYCLING-VERMONT

151. Vermont Pilot Recycling: Collection Programs Prepared by the Vermont Department of Environmental Conservation to show the results of the pilot recycling collection programs sponsored by the Vermont Agency of Natural Resources. The purpose of the programs were to assess the relative merits of various recycling collection systems and techniques. The report summarizes those results. (December 1990)

RESOURCE RECOVERY-SOLID WASTE-GENERAL

152. Dade County, Florida: A Resource Recovery Success Story Written by The senior vice president of Resource Recovery (Dade County) Inc. about the successes of the solid waste TMRF that the company built in Dade County Florida.

RURAL-AREAS-SOLID WASTE

153. Solid Waste Management For Rural Communities/ Special Program Presented at the ASTSWMO 1989 National Solid Waste Forum on Integrated Municipal Waste Management by SCS Engineers. With the changes to the regulations regarding waste disposal, Charles City County, Virginia sought an alternative to their past solid waste practice. The paper describes the new regulations for the rural town and the alternatives accessible to the town concluding with the final decision made by the County. (July 1989)

SLUDGE-REUSE-REGULATIONS

154. 1992 EPA National Excellence in Wastewater Treatment Awards
Awards given to individuals, municipalities, and companies concerned with maintaining overall environmental quality in the fields of O&M programs, improved plants, industrial pretreatment and beneficial use of bio-solids programs, and substantial efforts in stormwater and combined sewer overflow control. The listing provides the name of the winner in each category and the steps taken to win the award. (October 1992)

SOLID WASTE-EMPLOYMENT

Economic Development through Scrap Based Manufacturing
This study, written by the Institute for Local Self-Reliance and funded in part by the US EPA, presents 25 case studies of successful state-of-the-art scrap-based manufacturers. Analysis of waste-based production containing a summary of scrap-based manufacturing's benefits, as well as overview of the major industries involved, and a survey of public policy approaches to aid manufacturers, precedes each case. The studies cover the most common materials of the waste stream, and detail each venture's background, feedstock needs, process, products, financial situation, and reproducibility. (1992) The cases studied are:

155] Cycleclean, Inc., Los Angeles uses reclaimed asphalt pavement to make asphalt concrete hot mix.

156] ReClaim of New Jersey, Inc. uses asphalt roofing debris to produce asphalt paving material, pothole patch material and hot-mix asphalt modifier.

157] Optimum Art Glass, Inc. of Eaton, Colorado uses container cullet and plate cullet to make colored sheet glass.

158] Owens-Brockway, Portland, Oregon uses container cullets in the production of glass containers.

159] Stoneware Tile Co. in Richmond, Virginia uses furnace ready plate glass, windshield glass, and industrial scrap glass to make glass-bonded ceramic tiles.

160] AMG Resources Corp. of St. Paul, Minnesota uses source-separated ferrous cans and magnetically-separated ferrous material to make steel, tin and non-ferrous metals.

161] American Cellulose Manufacturing, Inc. located in Minonk, Ill. uses newspapers, corrugated containers, magazines, office waste paper, and phone books in the production of cellulose building insulation, animal bedding, hydro-mulch, and cellulose absorbent.

162] American Environmental Products, Elkwood, Virginia uses newspaper, phone books, and corrugated containers to make cellulose building containers, hydro-mulch, and cellulose fiber asbestos replacement.

163] The Chesapeake Paperboard Co. in Baltimore uses mixed paper, corrugated containers, and newspaper to make boxboard.

164] Fibreform Containers, Inc of Germantown, Wisconsin uses newspaper, mixed paper, and corrugated container to produce protective packaging products and molded nursery products.

165] Garden State Paper Company, Inc in Garfield, New Jersey use newspaper to make newsprint.

166] Homasote Co., West Trenton, NJ use newspaper in the production of structural fiberboard, roofing insulation, and packaging material.

167] Marcal Paper Mills, Inc. in Elmwood Park, NJ uses mixed paper to make bath tissue, facial tissue, paper towels, and napkins.

168] Ohio Pulp Mills, Inc., Cincinnati uses poly-coated paper to make market pulp.

169] Paper Service Limited of Ashuelot, NH reuse mixed paper to produce packaging paper, toilet tissue and napkins.

170] Patriot Paper Corp. In Hyde Park, MA use high-grade office paper to make printing and writing paper.

171] Somerset Fiber, Recycling Systems Corp., Cowpens, SC resuses corrugated containers to produce linerboard, corrugated medium, and bag paper.

172-Coon Manufacturing located in Spickard, MO uses natural high-density polyethylene in the production of plastic sheet and related products as well as rotational molded plastic products.

173] Landfill Alternatives, Inc., Elburn, Ill. reuses polystyrene fabrications to make polystyrene granules and pellets.

174] Polly-Anna Plastics Products, Inc. located in Milwaukee recycles polyethylene terephthalate, high-density polyethylene, high-impact polyethylene, polycarbonate, acrilontrile butadiene styrene, and acrylic in the production of high-density polyethylene recycling bins and flakes and pellets of other resins.

175] Turtle Plastic Co. in Cleveland reuses polyvinyl chloride, high-density polyethylene, and polyethylene terephthalate to make floor mats, urinal screens, and resin pellets.

176] Webster Industries of Montgomery, Alabama recycles low-density polyethylene, linear low-density polyethylene and high-density polyethylene to produce trash bags.

177] Aquapore Moisture Systems, Phoenix, Arizona uses ground rubber to make soaker hose.

178] Process Fuels, Inc. in Spokane, Washington uses scrap tires to produce polymer oil, fuel gas, and scrap metal.

179] Evanite Fiber Corp. of Corvallis, Oregon uses wood chips from pallets, shakes and utility spools and industrial plywood scrap to make hardboard.

180. Elwyn Recycling Venture Study

Written by the Institute for Local Self-Reliance and funded with a grant from Region III US EPA, the eighteen studies outline companies from across the country that hire people with disabilities to work in the facilities. The facilities are categorized by the work that is done there (six companies in each): collection/processing, processing centers, and manufacturing/remanufacturing. (April 1993)

SOLID WASTE-FACILITIES-ENERGY RECOVERY

181. A Report on Construction of a Solid Waste Energy Recovery Facility: New England Regulatory Guide

By the New England Federal Regional Council Energy, Resource Development Task Force and Energy Recovery Work Group, this dated report tries to identify planning, environmental, and regulatory requirements that must be satisfied during the planning, design, and construction, and operation of a solid waste recovery project. The types of facilities that are assumed in the report are dry fuel processing plants, waterwall incinerators producing steam and electricity, and pyrolysis facilities. Although important, requirements concerning solid waste storage, collection, haul, transfer, and land disposal are not discussed. (July 1976)

SOLID WASTE-GENERAL

182. Privatizing Municipal Waste Services: Saving Dollars and Making Sense

Published by the National Solid Wastes Management Association, the paper praises the benefits of privatizing waste collection, recycling, disposal, and street cleaning. Short case studies summaries for each of the topics show the benefits of private contracting for these services over being preformed by municipalities. [Street sweeping case studies: Southern California, Newark, NJ; Recycling case studies: Chesapeake, VA, Seattle, WA.; Disposal case studies: Knoxville, TN, Tampa, FL., Halifax, Nova Scotia.] (1991)

SOLID WASTE-REGIONAL APPROACHES

183. Teaming Up on Trash: Cost Savings Through Reorganization of Landfill and Transfer Systems

Published by Arthur Andersen and Malcolm Pirnie, the report is a 40+ page packet showing the benefits of regionalizing landfill and transfer systems using realistic, hypothetical scenarios.

SOLID WASTE-STUDIES

184. Long Island Town Takes Integrated Approach: Babylon, NY Written by Shirley Hawk, a former consultant to GBB, the consultant to Babylon, NY on this project, the article describes the steps taken by the town to comply with the new Long Island landfill laws and the New York State Environmental Conservation Law. The steps taken were the creation of a commercial and residential recycling facility and a WTE plant. (Waste Age, April 1992)

SOLID WASTE STUDIES-VIRGINIA

185. Economic Feasibility Study of Alternative Solid Waste Disposal Methods

The report was done by ICF Technology, Inc. for the City of Charlottesville, Virginia. It presents a financial feasibility study of alternative disposal methods for solid waste generated in Charlottesville and Albemarle County, Virginia. It includes information on waste generation, landfill costs, waste management alternatives, waste management scenarios, results comparisons, and conclusions and recommendations. (January 1990)

SOLID WASTE-VOLUME AND UNIT BASES

186. Unit Pricing Roundtable

Done by the US EPA, the paper discusses unit-pricing. The areas of concern identified were: community relations and citizen education, rate structure design, operational issues, illegal dumping, and multi-family units. Each topic is discussed by representatives from around the nation on how their town handled the situation. (December 1992)

SORTING

187. Evaluation of an Automated Sorting Process For Postconsumer Mixed Plastic Waste

The study done by Rutgers University Center for Plastics Recycling Research for the US EPA, qualifies the system's ability to identify and separately recover five types of plastic containers representative of those found in plastics recycling programs. It also discusses the system's potential for full-scale commercial application. (September 1993)

SOURCE SEPARATION-AUSTRALIA

188. Source Separation Recycling: A Case Study

In this paper, written by David Clouser of Tasmanian College of Advanced Education, an overview is given of resource recovery projects in Sydney, Melbourne, and Perth in South Australia. Finally a source separation recycling case study using the city of Glenorchy. (1982)

THIRD WORLD-WASTE PROGRAM

189. Simulation Model For Reuse Collection

Published in the 2nd World Congress on Engineering & Environment by the University of the Philippines, the paper attempts to use simulation models in the management of solid waste collection of a typical city in the Philippines. The city used is Iloilo City. The study tries to examine the socio-economic impacts or responses of a refuse collection system. (November 1985)

TIRES-ASPHALT [TIRES-CRUMB RUBBER]

190. Demonstration Project For Utilizing Crumb Rubber, Glass, and Plastic in Cold Mix Asphalt

Conducted by Asphalt Materials, Inc. and Heritage Research Group, this case study shows the feasibility of cold-mixing asphalt pavements with glass, plastics and rubber to reduce landfilling the waste and overcoming the performance related issues found in hot-mix asphalt when using these waste. (September 1992)

WASTELESS PRODUCTION

*[All of the **WASTELESS PRODUCTION** case studies were published in Non-waste Technology and Production: A Seminar of the United Nations Economic Commission for Europe by Pergamon Press for the United Nations in 1978. The "Case Studies" are summaries of each industry or process with no specific example used to show how it works.]*

191. Iron and Steel Industry: Pollution Control and Recycling

A summary of the various processes in the iron and steel, industry. It compares the old processes to a new one where pollution controls were added. (France)

192. The Outlook for Progress and Technological Methods in a Paper Industry Confronted with Environmental Problems
Summaries where pollution originates in the paper and pulp (mainly) production. Looks at waste-treatment problems and possible economically viable solutions. (France)
193. Non-waste Production of Bleached Kraft Pulp
Discusses the four main areas in which pollution occurs in the production of bleached kraft pulp [from the wood room, from spent cooking liquor left in the partially washed unbleached pulp, from the spent cooking liquor evaporator condensates, and the bleach effluent], and then discusses the steps involved in eliminating the waste streams from the production. (Canada)
194. Displacement Bleaching
First discusses the conventional technique for bleaching paper and then a new process called displacement or dynamic bleaching which drastically reduces the amount of bleach plant effluent and without the need for treatment. (Finland)
195. Pollution Prevention in Groundwater Using Sulfate Displacement Bleaching
[IN French]
196. Biological Method for Purifying Kraft Pulp Mill Condensates
Describes the Enso-Gutzeit's Research Centre's development of treating condensates from kraft pulp production by biological means. (Finland)
197. Packaging Alternatives For Wine
With the increase in the consumption of wine in Holland, and the wine being packed in non-returnable bottles, a paper-aluminum laminate substitute for the glass bottle has been proposed. Since both are non-returnable, an energy/resource consumption and the environmental impact of the two packages are compared. (Holland)
198. The Recovery of Glass in Switzerland
"From the point of view of the protection of the environment against pollution and degradation, a system of production without waste holds no advantage if it automatically entails a system of consumption with a high level of waste." In this context, the paper discusses the pros and cons of using postconsumer glass as the raw material in the glass industry. (Switzerland)

199. The Status of Non-waste Technology in The United States Steel Industry
Reports on the non-waste technology [NWT] efforts in the major phases of steel and steel-product manufacture, use, and discard. Summarizes NWT applications in basic steel-producing process, material design, product design and use, and product disposal and reuse. (USA)
200. The Status of Non-waste Technology in The United States Packaging Industry
The paper provides some examples of significant trends and developments in the US packaging industry with regards to waste reduction and resource recovery. (USA)
201. Nonwaste Technology: The Case of Tyres in the United States
The paper is devoted to an explanation of how engineering and economic efficiency are of use in understanding and correcting the scrap tire problem in the market economies, and a brief review of past, present, and future research on the problem that has been conducting in the US. (USA)
202. Two Examples of Low Emission Technologies in The Pulp and Paper Industries
This report describes the importance of production, structure and emissions of the pulp and paper industry in Germany. Low-emission manufacturing methods for each industry in Germany are briefly explained. (West Germany)
203. The Applications of Material-saving and Low-waste Technologies in the Metal Container Industry With Special Reference to Drawn and Wall-Ironed Beverage Cans
As the title suggests, the paper discusses various ways of material saving and low waste technologies in the metal container industry. The primary use of the research and development of the metal container industry is directed at an economical use of raw materials. (West Germany)
204. Disposal Of Ironworks Waste
The report shows how Mannesmann AG Huttenwerke approached the methodical re-use or recycling of waste products according to their types, volume, and place or occurrence. (West Germany)
205. The Heye-EPB Process, A Low-waste Technology
Discusses the Heye-EPB process for glass blowing. The process allows for less material to be used than convential glass blowing production. (West Germany)

WOOD-RECYCLING

206. Wood Waste Recovery Case Study (August 1991)
Published in Resource Recycling, this short article describes the Fibre Fuel Products, Inc. of California processing of waste wood [not treated with creosote or copper naphthalene] for use as fuel in wood energy plants.

* * *

Subtitle C:

C POLLUTION PREVENTION-JEWELRY MANUFACTURING

207. Toxic Use Reduction Case Study:
Wastewater Treatment and Metal Recovery at the Robbins Co.
Written by the Office of Technical Assistance, Executive Office of Environmental Affairs of Massachusetts. The Robbins Co. installed a new wastewater treatment and metal recovery system to create a closed looped plating process. The company now produces very little hazardous waste and discharges nothing but domestic waste and non-contact cooling water from its annealing furnaces.

C POLLUTION PREVENTION-METALS MANUFACTURING

208. Finding Green in Clean: Progressive Pollution Prevention at Hyde Tools
Published in Total Quality Environmental Management by Joseph Paluzzi of Massachusetts Office of Technical Assistance and Timothy Greiner, an MIT graduate student. It describes how Hyde Tools Inc., of Southbridge, Massachusetts, makers of industrial and trade blades and knives, eliminated the use of 1,1,1 trichloroethane, eliminated wastewater discharges, recycled all quench oil used, and ended the use of kerosene for removing polishing compounds from their products. It also implemented other improvements, e.g. replacement of fluorescent lighting with metal halide lighting. (Spring 1993)

C POLLUTION PREVENTION-PRINTING

209. Case Studies from the Pollution Prevention Information Clearinghouse
Published by the US EPA Office of Environmental Engineering and Technical Demonstration and the Office of Pollution Prevention. Fifteen case study summaries, from around the country, describe how printing companies eliminated waste by adding recovery units, ink substitutions, and recycling spent ink. (November 1989)

C PUBLICATIONS

210. Data User's Guide to the United States EPA Long-term Monitoring Project: Quality Assurance Plan and Data Dictionary

Describes the process for sampling and analytical procedures, quality assurance, and quality control procedures with specific procedures and methods added for the Maine, Vermont, Adirondack, Upper Midwest, Colorado, and Catskill regions. (December 1991)

210 1/2. Design and Construction Issues At Hazardous Waste Sites: Conference Proceedings

The two volumes were published by the US EPA and contain 17 case studies dealing with hazardous waste. Other papers on community relations, construction management issues, groundwater remediation, health and safety, policy/management issues, pre-design issues, design issues, and treatment technologies were also presented. (May 1991)

211] Tom Ambalam of Kaiser Engineers talks about use of composite concrete liners for radioactive wastes.

212] R. Tom Clark and Diane Gow of Camp Dresser & McKee Inc. and Jon Bornholm of Region IV US EPA discuss fast-tracking remedial design at the Cape Fear Wood Preserving Site.

213] Bruce Dumdei and Nancy Bryant of ENSR Consulting and Engineering, Ted Davis of French Limited Task Group, Inc. and Judith Black at US EPA Region VI report on ambient air quality management at French Limited Superfund Site.

214] Santanu Ghose and Garret Bondy from the US EPA wrote about remedial construction at the industrial waste control site in Fort Smith, Arkansas.

215] Robert Griswold and Stephen Gilrein from Region VI of the US EPA presented a paper on Bayou Bonfouca Superfund Site in Slidell, Louisiana.

216] Edward Hagarty of C.C. Johnson & Malhotra, Inc. and others introduce soil remediation in the New Jersey Pinelands.

217] Bryon Heineman from Region VI of the US EPA writes about when is a superfund remedial action complete and uses as a case study the Crystal City Airport remedial action implementation and transition to operations and maintenance.

218] Tinka Hyde from Region V and William Dudley of B&V Waste Science and Technology Corp. describe WEDZEB Enterprises remedial action.

219] Victor Janosik of the US EPA tells of Lansdowne Radiation Site and how it was a successful cleanup in a residential setting.

220] Kevin Klink and Jeffrey Obert of CH2M Hill writes about remedial design approach and design investigations at the Bayou Bonfouca Superfund Site.

221] Amy Monti and Vern Singh of URS Consultants, Inc. describe value engineering studies of the Helen Kramer Landfill Superfund Site.

222] Timothy Rehder and Erna Acheson, both from US EPA Region VIII tell of remedial action in and around light industrial activity at the Denver Radium Superfund Site.

223] Debbie Richardson and Harry Perry of Chem-Nuclear Geotech Inc and J.E. Virgona of the US EPA introduce streamlining remedial design activities at the Department of Energy's Monticello Mill Tailings NPL Site.

224] Cliff Schexnayder of Nello L. Teer Co. and Harvey Wahls of North Carolina State University Dept. of Civil Engineering describe the construction of a kaolin clay cap for buried nuclear waste.

225] Vern Singh and James Lanzo of URS Consultants, Inc. tell of the lessons learned from remedial design of the Helen Kramer Landfill Superfund Site.

226] James Steed of IT Corp. and Earl Hendrick of US EPA Region VI discusses contract security in Superfund and the need for an open dialogue between government and the remedial construction industry.

227] Robert Zaruba from the US Army Corps of Engineers and David Dickerson from Region I US EPA write about remedial design and construction at the Charles George Landfill Superfund Site.

228. Guidelines for Delineation of Wellhead Protection Areas
The document was prepared by the US EPA to furnish technical guidance to states to protect areas surrounding wells in their jurisdiction against contaminants that may effect human health. It provides state examples, specifically in Florida, Massachusetts, and Vermont, European examples in the Netherlands and West Germany, and comparative analysis of Cape Cod, Southern Florida, Central Colorado, and Southwestern Connecticut. The comparative analysis include hydrology of the study area, method application, data requirements, and comparison of resulting Wellhead Protection Areas (WHPA's). (June 1987)

229. RCRA Facility Assessment (RFA) Training Course

Done by the US EPA, the three case studies in the manual are outlines to follow in a facility assessment. The first is a preliminary review, the second a visual site inspection, and the third is a sampling visit. (1986)

RCRA Public Involvement Manual

This manual, published by the US EPA, provides instruction on how to plan and carry out successful public involvement in RCRA permitting and corrective action programs. Two case studies are included.

230] Chemical Manufacturer in the Northeast

The case illustrates how the EPA might have avoided a frustrating permitting process by anticipating problems, educating the public about the other agencies involved in regulating the facility, and focusing on problems/workload adjustments.

231] The Ensco Hazardous Waste Management Facility in Mobile, Arizona

This case shows a facility permitting effort that would have benefitted from the implementation of a concerted public involvement program early on in the process. It also points to the value of taking advantage of what other EPA and state personnel have learned from meeting with the community on similar permitting projects. (1993)

C RECLAMATION-LAND-EUROPE

232. Reclamation and Redevelopment of Contaminated Land: Volume 2 European Case Studies.

Published by the US EPA, the report highlights programs dealing with reclamation and redevelopment of contaminated land in England, Wales, Sweden, the Netherlands, and West Germany. The studies addresses site assessment and reclamation programs, available funding sources, and guidelines established to assist in the reclamation. Each study describes the land use history and redevelopment objectives, remediation activities, site reuse, and criteria for cleanup. (April 1992)

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RECYCLING-MUNICIPALITIES-UNITED STATES

233. Recycling In America: Profiles of the Nation's Resourceful Cities

Compiled by the U.S. Conference of Mayors and sponsored by the H.J. Heinz Foundation, this document provides brief documentation of the recycling programs of over 100 cities and towns, large and small. The document tells you what the population served is, what materials are collected, what type of recycling system is used and whether it is voluntary or mandatory. Of special note is a contact address and the waste disposal cost per ton. Some entries tell what percentages of waste are landfilled and incinerated, participation rates and special features of the program. (June, 1991)

Capturing the Local Economic Benefit of Recycling: A Strategy Manual for Local Governments (1993)

Published by the Local Government Commission, with inputs by the National Recycling Coalition and the National League of Cities this document provides strategies for the milestones that cities must attain to integrate recycling to waste management on a profitable basis. The 43 case studies revolve around central issues:

Issue 1: Localizing Collection and Processing

- 234. Boulder, CO gives the curbside collection and processing contract to a for-profit hauler and a nonprofit recycler.
- 235. Seattle, WA creates a self-funded solid waste utility to administer garbage and recyclable collections.
- 236. Pittsburgh, PA uses unionized city workers to collect recyclables.
- 237. Minneapolis, MN gives a hauling contract to an 'umbrella' corporation.
- 238. Portland, OR awards collection franchises to numerous small and large private companies.
- 239. New York City's sanitation department contracts with a for-profit enterprise of a local development corporation.
- 240. Broome County, NY owns and operates its own MRF.

Issue 2: Recycling as a Tool for Employment Development

- 241. Santa Clara County, CA helps to start a community-based youth recycling program.

