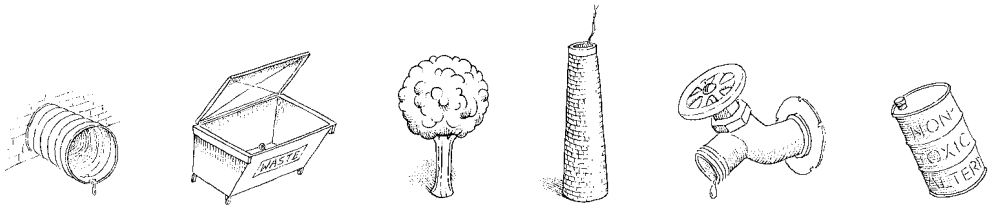
Interagency Pollution Prevention Advisory Team [IPAAT]



Pollution Prevention Summary Report

Consolidated from reports submitted by members of the Interagency Pollution Prevention Advisory Team for the fiscal year 2001

May 2002

POLLUTION PREVENTION
Right From The Start

IPPAT Agency Contacts

Department of Administration
50 Sherburne Avenue, St. Paul, MN 55155
Contact: Lynne Markus (651) 296-9084

Department of Agriculture
90 West Plato Blvd, St. Paul, MN 55107
Contact: Ed Chromey (651) 297-8052

Department of Commerce
121 7th Place E, St. Paul, MN 55101-2145
Contact: Mike Taylor (651) 296-6830

Department of Corrections
1450 Energy Park Drive, St. Paul, MN 55108
Contact: Jim Weiler (651) 779-1449

Office of Environmental Assistance
520 Lafayette Road, St. Paul, MN 55155
Contact: Emily Moore (651) 215-0201

Department of Human Services
444 Lafayette Rd, St. Paul, MN 55155
Contact: Glenn Olson (651) 297-8742

Iron Range Resources and Rehabilitation Board
1006 Highway 53 South, Eveleth, MN 55734
Contact: Gordy Dormanen (800) 765-5043

Metropolitan Airports Commission
6040 28th Ave. South, Minneapolis, MN 55450
Contact: Mark Wacek (612) 725-6428

Metropolitan Council - Environmental Services
230 East Fifth Street, St. Paul, MN 55101-1633
Contact: Mike Nevala (651) 602-1065

Metropolitan Council - Transit Operations
515 Cleveland Ave. North, St. Paul, MN 55114
Contact: John Bryan (651) 349-5080

Metropolitan Mosquito Control District
2099 University Avenue W, St. Paul, MN 55104
Contact: John Thompson (651) 645-9149

Military Affairs
P.O. Box 348, Camp Ripley, Little Falls, MN 56345
Contact: John Ebert (320) 632-7447

Minnesota Technical Assistance Program (MnTAP)
1313 Fifth Street, SE, Minneapolis, MN 55414
Contact: Donna Peterson (612) 624-4653

Pollution Control Agency
520 Lafayette Rd, St. Paul, MN 55155
Contact: Ray Bissonnette (651) 297-8588

Department of Transportation
3485 Hadley Avenue North, Oakdale, MN 55128
Mark Vogel: 651.284.3790

Board of Water & Soil Resources
200 One West Water Street, St. Paul, MN 55107
Contact: Mary Miller (651) 296-0873

EDUCATIONAL INSTITUTIONS

Anoka-Hennepin Technical College
1355 West Highway 10, Anoka, MN 55303
Contact: Thomas Silvers (612) 576-4705

Bemidji State University
1500 Birchmont Drive NE, Box 10
Bemidji, MN 56601-2699
Contact: Richard Marsolek (218) 755-3988

Mankato State University
MSU Box 105, Mankato, MN 56003
Contact: Sheri Prosch (507) 389-5568

Metropolitan State University
700 East Seventh Street, St. Paul, MN 55106
Contact: Thomas Maida (651) 772-3712

Minnesota State Colleges and Universities (MNSCU)
550 Cedar Street, St. Paul, MN 55101
Contact: Allan Johnson (651) 282-5523

Minnesota West Community and Technical College
1011 First Street W, Canby, MN 56220
Contact: Jeff Harms (507) 223-7252

Moorhead State University
1104 7th Avenue S, Moorhead, MN 56563-2996
Contact: Alan Breuer (218) 236-2998

North Hennepin Community College
7411 85th Avenue N, Brooklyn Park, MN 55445
Contact: Larry Meyers (763) 424-0772

St. Cloud State University
720 Fourth Avenue S., St. Cloud, MN 56301-4498
Contact: James Williams (320) 255-2266

Southeast Technical College
308 Pioneer Road, Red Wing, MN 55066
Contact: Greg Williams (507) 453-2770

University of Minnesota—DEHS
501 23rd Avenue SE
Minneapolis, Minnesota 55455-0447
Contact: Andy Phelan (612) 626-7744
Gene Christenson (612) 626-1590

Table of Contents

Introduction

The *Pollution Prevention Summary Report* is a consolidation of the summary reports on pollution prevention activities for the fiscal year 2001 submitted by participating Minnesota state agencies—members of the Interagency Pollution Prevention Advisory Team.

Purpose of the report. Every year, state agencies are required to prepare a summary of their progress in preventing pollution. This report fulfills the requirements of Governor's Executive Order 99-4 providing for the implementation of pollution prevention and resource conservation by state government. The full text of Executive Order 99-4 is available on the Office of Environmental Assistance (OEA) web site at http://www.moea.state.mn.us/lc/executiveorder.cfm.

Organization of the report. The *Pollution Prevention Summary Report* is divided into four parts.

- Part 1 describes each agency, including the number of employees, locations of the agencies, and pollution prevention training held during the last year.
- Part 2 summarizes each agency's policy and regulatory activities that have incorporated pollution prevention in its broader sense.
- Part 3 summarizes each agency's efforts toward pollution prevention within specific category headings. It is designed to facilitate greater use of the document by participating agencies and by others seeking information about pollution prevention opportunities.
- Part 4 contains a matrix of the agencies providing activity summaries under the different categories. It allows the reader to identify all the categories in the report for which a particular agency has provided a summary of activities.

Original signed copies of the report from each agency are on file at the Office of Environmental Assistance. For more information, contact Emily Moore at the OEA at (651) 215-0201 or toll-free at (800) 657-3843.

Part 1
Agency Descriptions

Part 1 includes general information about participating agencies, including size of staff, the number of locations, and the amount of pollution prevention training staff have had during fiscal year 2001.

Department of Administration — The Department of Administration (Admin) works to improve the quality and productivity of Minnesota government by providing an essential array of business management and administrative services, including electronic government services. The Department of Administration consists of five bureaus and 24 divisions, with support to nine separate councils. Admin is a department with diverse components yet a common commitment to serving other state departments. The department's primary customers are the executive, judicial, and legislative branches of state and local government.

With jobs as varied as maintaining government buildings and grounds, providing services to manage information technology resources for state agencies, or devising technology policy to meet the needs of the new millennium, the Department of Administration's employees are customer-oriented. They are pledged to making government work better. The department's 900 employees are located in 36 locations. Admin's Materials Management Division and the Plant Management Division's Resource Recovery Office incorporate pollution prevention in their service to state and local agencies.

The Department of Administration manages Minnesota's State Resource Recovery Program, which was established in 1980 to "promote the reduction of waste generated by state agencies, the separation and recovery of recyclable and reusable commodities, the procurement of recyclable commodities and commodities containing recycled materials, and the uniform disposition of recovered materials and surplus property" (Minn. Stat. § 115A.15 Subd. 1). Admin's customer services and program achievements have been publicly recognized with six environmental awards and two scholarships.

Admin's Plant Management Division (PMD) administers the State Resource Recovery Program through its Resource Recovery Office (RRO). This office also provides interagency waste reduction and recycling assistance, on-site consultation and training, recycling progress measurement and reporting, management of recycling collection and marketing systems, and operates the Minnesota State Recycling Center. The RRO also works closely with Admin's Materials Management Division (MMD) to implement the program's environmental purchasing and surplus property requirements.

Department of Agriculture — The Minnesota Department of Agriculture (MDA) currently employs approximately 500 personnel. There are 26 different MDA facilities located throughout the state. This report is primarily for the St. Paul office complex located at 90 West Plato Boulevard.

Department of Commerce — The department employs approximately 314 staff in downtown St. Paul and an additional 38 staff in Roseville. This report covers agency pollution prevention activities at both locations. Department of Commerce staff has not received any pollution prevention (P2) training during the past year.

Department of Corrections — Approximately 3,683 staff work at the Department of Corrections throughout 11 locations. This report is for nine locations. Department of Corrections staff has received some pollution prevention training during the past year. Physical plant staff from both the Minnesota

Correctional Facility-Stillwater (MCF-STW) and Oak Park Heights (MCF-OPH) were trained and recertified in asbestos abatement in fiscal year 2000.

MCF-OPH plant engineers and electricians attended training on boiler efficiency and generator maintenance and regulations, the latter because OPH will be getting a new generator this year. The general maintenance workers attended training on new, safer products and energy savings equipment. For MCF-RC, hazardous waste prevention is addressed at the Rush City Academy orientation. On the whole the correctional facilities do not generate significant quantities of hazardous waste or use significant quantities of resources and/or toxic chemicals.

Office of Environmental Assistance — The Minnesota Office of Environmental Assistance (OEA) was established on July 1, 1994. OEA's predecessor agencies, the Minnesota Office of Waste Management and the Minnesota Waste Management Board, had been in existence since July 1, 1980. The OEA employs a staff of 62 people in the St. Paul office and one staff person in each of the five regional offices. OEA's mission is to help Minnesotans make informed decisions and take actions that conserve resources and prevent pollution and waste to benefit the environment, economy and society. OEA works in partnership with businesses, local governments, schools, community organizations, and individuals to apply innovative approaches to Minnesota's environmental issues.

In addition, the OEA provides funding for the Minnesota Technical Assistance Program (MnTAP) at the University of Minnesota. MnTAP helps industrial service and manufacturing businesses maximize resource efficiency, prevent pollution, and reduce costs. Rather than focus solely on end-of-pipe treatment or control solutions, MnTAP helps Minnesota companies reduce or prevent—at the source—the amount of waste they generate and find alternatives to using hazardous materials. By implementing waste reduction techniques, Minnesota companies can achieve or go beyond compliance with environmental regulations, reduce their disposal and raw material costs, and make conditions healthier and safer for employees. MnTAP works not only with businesses and generators of waste, but also with business organizations such as trade associations, local governments, and chambers of commerce that themselves provide assistance or service to businesses. OEA and MnTAP staff have planned and participated in pollution prevention training events throughout the year.

Department of Human Services — The Department of Human Services has about 6,700 employees. The department has seven regional treatment centers, over 100 state operated community services (SOCS), Minnesota extended treatment options (METO) sites, and the central administrative offices at eight St. Paul locations. This report includes pollution prevention efforts at all of the regional treatment centers and the central administrative office. The SOCS are operated as households and comply with the solid waste requirements of their host communities. More than thirty maintenance workers and safety officers received annual asbestos training that included proper repair, handling and disposal of asbestos containing materials.

Metropolitan Airports Commission — The Legislature created the Metropolitan Airports Commission (MAC) in 1943 as a public corporation and established as its mission to "provide a system of airports that promotes regional, national and international transportation of passengers and cargo. This system shall be operated, consistent with the public interest and promote the overall goals of the state's environmental policies and minimize the public's exposure to noise and safety hazards around airports." MAC is governed by 15 commissioners, thirteen of whom are appointed by the governor and the other two are the mayors of Minneapolis and St. Paul or their designees.

MAC owns and operates six reliever airports and the Minneapolis/St. Paul International Airport (MSP). While MSP handles commercial air traffic, the reliever airport system handles the majority of the general aviation traffic. In 2000, MSP serviced more than 36 million passengers and supported 523,000 flight operations. The reliever airport system supports more than 875,000 flight operations per year.

MAC presently employs approximately 520 people who are responsible for a wide variety of duties. The airport system has been likened to "running a small city." The organization can basically be divided into three areas—landside, airside, and administration. Landside includes Ground

Transportation, the Airport Director's Office, Energy Management, and Facility Management. Airside consists of Operations, Carpentry, Communications, Electrical, Fire, Police, Maintenance (field and mechanical), and the Paint Shop. Administration includes Airport Development, Environment, Commercial Management, Executive, Finance, Human Resources, Insurance/Risk, Labor Relations, Legal, IS, Public Affairs, and Purchasing.

This summary reports for the agency as a whole. Staffed facility locations include the Lindbergh and Hubert H. Humphrey terminals at MSP International, as well as Maintenance, Trades, and two administrative locations. MAC continually reevaluates and updates all pollution prevention methods and practices. Communication and topic-specific training is ongoing. All items listed in Part 3 are ongoing processes and will be reviewed and updated regularly to reflect improvements in the program/operations. This will be accomplished through increased awareness of MAC staff and its tenants of environmentally friendly products/processes that reduce waste and minimize environmental hazards.

Metropolitan Council – Environmental Services — The Metropolitan Council Environmental Services (MCES) is a division of the Metropolitan Council, the public agency which coordinates regional planning and guides development in Minnesota's seven-county metropolitan area. MCES operates the regional wastewater collection and treatment system in most of that same seven-county Twin Cities metropolitan area. Additional regional environmental responsibilities include industrial wastewater pretreatment and management, air and water quality monitoring, regulatory compliance, environmental education, water resources planning, and non-point source pollution abatement.

MCES operates eight treatment plants in addition to three maintenance facilities, a field office, and administrative headquarters for a total of 13 staffed facility locations. MCES has approximately 710 staff (full-time equivalent positions). This report describes pollution prevention activities for the entire MCES. A separate report will cover pollution prevention for 2000 for Metro Transit, the division of the Metropolitan Council, which provides public transit, i.e. bus service and a planned light-rail system, for Minneapolis, St. Paul, and surrounding suburban areas including 78 cities.

MCES is an active member of the Interagency Pollution Prevention Advisory Team (IPPAT). Michael Nevala, P2 contact for MCES, also has been a member of the Minnesota Office of Environmental Assistance's (OEA) Prevention, Reduction, and Recycling Advisory Council (PRRAC) since its beginning in 1997. In addition to this professional contact and resulting internal sharing of information, some informal P2 training occurs at the treatment plants related to maintenance, and all employees in the industrial waste section have been formally trained. P2 Week was publicly observed in September 1999 with a breakfast, keynote speech, and awards presentations, all organized by the OEA with MCES participation.

Metropolitan Council – Transit Operations — Metro Transit is the major supplier for mass transit in the seven-county metropolitan area, operating more than 900 buses over 109 routes. To accomplish this service, Metro Transit operates five service garages, one overhaul facility, one police station, and an office building with a total staff of 2,340 employees. During the past year, Metro Transit has increased its ridership by 2 percent and is upgrading its fleet with newer buses. This report covers all of the buildings that are operated by Metro Transit. During the last year, no formal P2 training was conducted by Metro Transit, but opportunities were given to staff to attend programs put on by other agencies pertaining to pollution prevention.

Metropolitan Mosquito Control District — The Metropolitan Mosquito Control District (MMCD) controls mosquitoes and black flies in the metropolitan counties of Anoka, eastern Carver, Dakota, Hennepin, Ramsey, Scott, and Washington. The district employs 46 full-time staff and approximately 170 part-time staff during the mosquito and black fly breeding season. The district currently operates a warehouse facility, six field operations facilities, and a central administration building. The district

also owns and operates a small fleet of vehicles. This report covers P2 activities for all the facilities operated by Metropolitan Mosquito Control District for the 2001 fiscal reporting period.

Minnesota State Colleges and Universities (MnSCU) — MnSCU is a network of 34 two-year and four-year state colleges and universities, serving about 140,000 students each semester.

Bemidji State University — Bemidji State University includes two locations: the BSU main campus and the Center for Research and Innovation. BSU employs approximately 474 faculty and staff, and 615 student employees during the academic year, and approximately 428 faculty and staff, and 170 student employees during the summer. This summary reports on both locations.

No specific pollution prevention training was implemented during the last fiscal year. However, procedures and opportunities for participating in waste reduction and recycling activities, both on and off campus, are communicated through a faculty/staff computer information list, the campus newspaper, and information provided by the BSU Environmental Advisory Committee.

North Hennepin Community College — Approximately 350 staff members work at two locations: North Hennepin Community College campus, with off-campus classes occurring at Buffalo High School in Buffalo, Minnesota. This report covers only the North Hennepin Community College campus. P2 training is required of Plant Services staff and certain other staff, and is voluntary on part of other staff.

St. Cloud State University (SCSU) — St. Cloud University employs approximately 1500 administrative, teaching, clerical, and technical maintenance personnel in both full- and part-time positions. The campus consists of 42 buildings and is situated on over 100 acres. For purposes of this report, all campus locations will be included.

Pollution Control Agency — The Minnesota Pollution Control Agency (MPCA) has approximately 730 staff located in the central office in St. Paul and seven district offices in Duluth, Brainerd, Detroit Lakes, Mankato, Marshall, Rochester, and Willmar. This report covers activities of the agency at the central office. Some staff has received pollution prevention training, but most have not.

Department of Transportation — The Minnesota Department of Transportation (Mn/DOT) has approximately 5,700 employees. Mn/DOT is a decentralized organization with one central office, seven districts, and one metropolitan division. Mn/DOT has 16 major truck stations (A and B headquarters located in each district and the metropolitan division) with 135 additional truck stations. Mn/DOT has numerous remote salt sheds and gravel pits. The department maintains approximately 12,800 miles of highway (28,837 lane miles) and 4621 bridges. This report represents Mn/DOT as a whole with respect to Mn/DOT's efforts in pollution prevention.

University of Minnesota — The University of Minnesota has 30,823 employees and 59,185 students on four major campuses: Crookston, Duluth, Morris, and Twin Cities (the Twin Cities campus, which is counted as a single campus, includes both the Minneapolis and St. Paul campuses) and operates the University Center Rochester in cooperation with MnSCU.

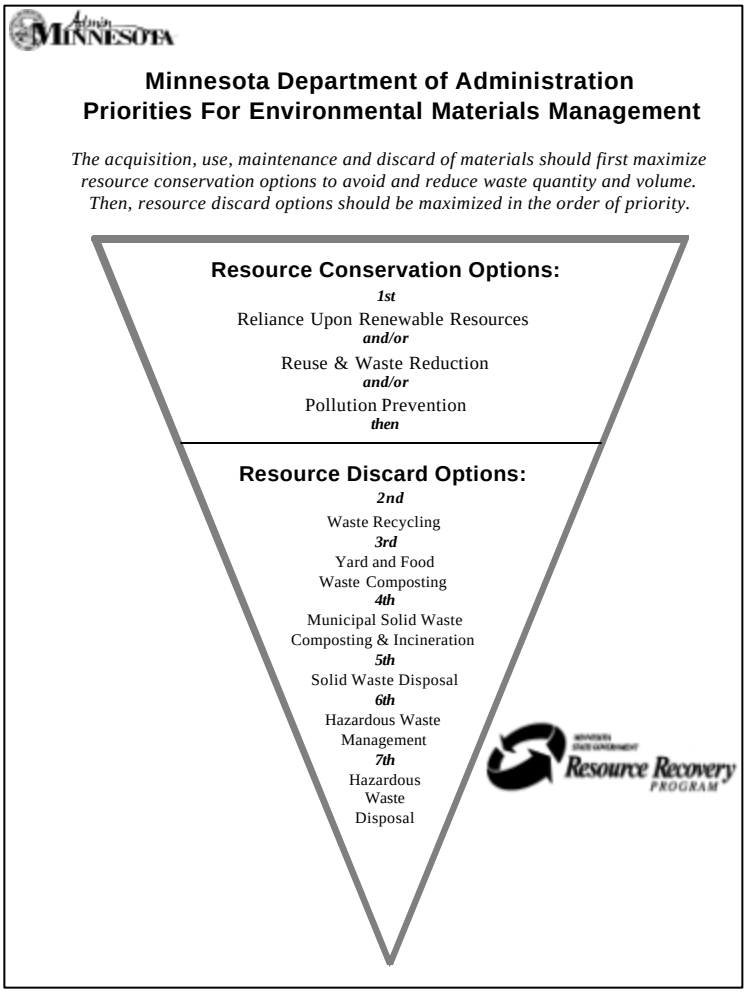
The university has approximately 22 experiment or research stations, extension agents in all 87 counties in Minnesota, and has approximately 50 EPA ID numbers for hazardous waste generator sites around the state of Minnesota. This report covers the university as a whole. Approximately 2,500 staff and faculty received pollution prevention training during the past year.

Part 2

Policy and Regulatory Activities

Department of Administration — The Department of Administration specifically addresses pollution prevention as a top priority in its Policy on Environmental Materials Management and its Priorities for Environmental Materials Management. The Resource Recovery Office promotes the adoption of environmental values by Plant Management, and the mission statements of both divisions specifically include leadership in environmental stewardship. Consequently, Plant Management Division employees are directed to use resource conservation and pollution prevention practices in the maintenance of buildings, grounds, support operations, and during their daily service to customers.

Resource Recovery Office developed Admin's Priorities for Environmental Materials Management that have been in effect since adoption in 1991 (see sidebar). The Materials Management Division and the Resource Recovery Office distribute this list of priorities to public employees during purchasing training and other opportunities. Admin also facilitates paper waste reduction and information transfer through the Internet at http://www.admin.state.mn.us/ and http://www.mmd.admin.state.mn.us/.



Admin's focus on environmental partnerships during the past decade has helped to leverage resources and contribute toward a more sustainable quality of life. Sustainability requires a balance between economic, community, and environmental considerations.

The Plant Management Division's mission statement encompasses pollution prevention and other environmental concepts (see following page). The Resource Recovery Office in the Plant Management Division encourages pollution prevention and promotes the preferred waste management practices contained in Minnesota Statutes § 155A.02 during the acquisition, use, maintenance, and discard of materials.

Plant Management Division
Mission Statement

Our mission is to deliver consistent quality services to ensure clean, safe and environmentally sound buildings, grounds and operations.

Our customers are all people who use our services throughout the state of Minnesota.

The services we provide are a continuum of building, grounds and professional services specific to the customers' needs. They include building maintenance, cafeterias, energy management services, grounds, janitorial, materials transfer, parking, administration of the state resource recovery program and special use of state facilities permits.

Our core values are

High quality professional staff with:
- accountability
- honesty and ethics
- loyalty
- integrity
- commitment to teamwork
- respect of others and ourselves
- knowledge

Responsiveness to our customer needs through:
- communication
- efficiency
- timeliness

Provide quality work through:
- modern technology
- employee training

Responsible business practices that encourage:
- professionalism
- cost effectiveness
- open communication

Plan for the future, considering:
- technology
- employee development
- establishment of long-term goals
- involvement of clients

Environmental stewardship with:
- conservation of resources
- prevention of pollution
- promotion and education
- integration into all work places and services

Created 1/92

The Plant Management Division continually revises and updates employee position descriptions, requiring each employee to be individually accountable for achieving environmental stewardship as a function of his/her job responsibilities. Employees are to follow state and federal requirements and shall identify opportunities to implement environmental values.

Department of Agriculture — The Laboratory Services Division continues to research ways to reduce the amount of hazardous waste it generates by purchasing new technology that reduces the use of hazardous chemicals. In addition to new technology, they look for alternative methods that will help in the reduction of hazardous waste streams. The department has an ongoing waste reduction program

and actively looks for ways that it can reduce the amount of non-recyclable/reusable products used on a daily basis. The department continues to educate the public on the responsible use of pesticides and fertilizers within their environment.

Department of Corrections

Minnesota Correctional Facility-Lino Lakes (MCF-LL) — As part of an ongoing effort to reduce pollution, the MCF-LL is committed to keeping pollution producing activities to an absolute minimum. The categories indicated in Part 3 represent areas where there are no other options available to reduce or eliminate the pollution potential; however, they are dealt with through recycling efforts either through an outside contractor or in-house staff.

MCF-Oak Park Heights (MCF-OPH) — Over the past few years, the institution has installed energy saving equipment in various areas in an attempt to lower its utility bills. This year during a remodeling project, water-saving showerheads were installed in one complex, and one or more complexes are scheduled for the fiscal year 2002. Water-saving, electronically timed showers, water saving aerators on sinks, and electronic flush controls on the individual room toilets are scheduled to be installed in the coming year. Gas-fired kitchen appliances were installed several years ago as part of a joint NSP and Department of Administration energy program to lower electric costs. As the equipment wears out, newer, more efficient gas equipment is being installed. MCF-OPH continues to pursue the goal of energy efficient equipment, while still providing adequate services to offenders.

In an attempt to lessen the amount of materials being landfilled, MCF-OPH has instituted a food-recycling program with Stratton Farms through which food scraps and remains are saved and used to feed pigs. In this manner, approximately 110 tons of food waste were recycled in fiscal year 2001. Additionally over the course of the year, the facility has decreased trash pickups to approximately one per month due to the food-recycling program.

Since inception, the MCF-OPH has had the policy of using the safest possible product, with the lowest capability of generating hazardous waste and polluting the environment. The purchasing office has followed this policy to the best of its ability. The policy is due not only to recognition of the need to protect our environment, but also to the type of offenders housed at this facility, and for the protection and safety of both staff and offenders. Potentially unsafe products, i.e. rating more than 0 or 1 on HMIS or NFPA scales, are replaced with a suitable product which will accomplish the same end. MCF-OPH staff places a high priority on using techniques, methods, and products that are nonhazardous or less hazardous to reduce pollution and waste at its source. Our facility is considered a very small quantity generator (VSQG) by Washington County and the MPCA, shipping only approximately 100 gallons of hazardous waste each year.

MCF-Red Wing — To reduce paper load, the safety officer at MCF-RW has transferred all Material Safety Data Sheets to electronic copies.

MCF-Shakopee — MCF-SHK encourages staff to use e-mail for communication instead of paper. The facility purchases recycled products when available and has a recycling program for paper, plastic, aluminum, glass, lamps, cardboard, oil, antifreeze, scrap metal, batteries, and used rechargeable batteries when possible. Old computers are donated to the MCF-STW's program, which recycles computers for schools.

To conserve energy, policy requires windows to remain closed. The entire facility is climate controlled. Lighting, heating, cooling, and ventilation equipment operate only when needed.

MCF-Stillwater — MCF-STW has worked with the Washington County Hazardous Waste Inspector, the state authorized hazardous waste contractor, vendors, and staff to reduce the hazardous waste generated at the facility. MCF-STW reduced waste generation to the point that

the facility has been downgraded from a large quantity generator to a small quantity generator. To accomplish this downgrade, annual training covered the purchase, use, and disposal of hazardous materials. On an ongoing basis, all staff are expected to review the hazardous materials that they use and recommend changes to use safer products and processes as they become available. For example, the paint shop added a powder coating line, which has helped to reduce the generation of waste solvents and VOCs into the air. The upholstery shops and furniture shops changed to a non-flammable adhesive in their operations and developed procedures to minimize waste.

Office of Environmental Assistance — The OEA concentrates on pollution prevention policy and outreach. MnTAP focuses the vast majority of its efforts on technical assistance to other organizations and companies with a goal of preventing pollution. Pollution prevention programs in Minnesota have had a distinct advantage over many other states by having stable, well-funded programs for the past ten years. The Toxic Release Inventory and other data sources have shown a decrease in emissions and waste generation.

A whole host of new information and tools is available that expand our original "pollution prevention vision," including environmentally preferable purchasing, green buildings, design for the environment, and Environmental Management Systems (EMS). MnTAP uses all these tools in their assistance to Minnesota businesses. With help from MnTAP site visits and intern projects over the last two years, companies have eliminated 8.7 million pounds of waste and reduced their use of water by 89 million gallons, resulting in company savings of $4.2 million.

The OEA's product stewardship policy and initiatives also employ a preventive approach to conserving resources, and reducing waste and toxicity. Product stewardship encourages people to think differently about the products they make, buy and use, so that manufacturers, retailers and consumers think about and treat products as resources rather than waste. Product stewardship means that everyone involved in designing, manufacturing, selling and using products takes responsibility for the environmental impacts at every stage of a product's life. In particular, product stewardship asks manufacturers to share in the financial and physical responsibility for recovering and recycling products when people are done using them.

The OEA's product stewardship policy creates partnerships between government and industry to reduce the environmental impacts of manufactured products throughout their life cycles in an economically efficient and environmentally beneficial manner. When manufacturers share the costs of recycling products, they have an incentive to use recycled materials in new products and design products to be less toxic and easier to recycle, incorporating environmental concerns into the earliest phases of product design. Minnesota is the first state to develop and implement a product stewardship policy.

Department of Human Services — The Department of Human Services (DHS) produces a very small amount of hazardous waste from campus maintenance and client work programs. Most activities involve recycling programs at the regional treatment centers that provide work therapy for our clients and a source of funds for their work therapy programs. The central office buildings continue to achieve a recycling rate above 60 percent.

The Moose Lake SOCS facility has mandated the use of water-based finishes in its woodworking program and has eliminated solvent-based finishes. DHS is also moving toward the elimination of mercury containing medical devices on all campuses.

DHS has implemented an electronic benefits transfer program (EBT). The EBT program replaces paper transactions with an electronic debit card at the point of sale. The program started in the metro area and is now statewide.

Metropolitan Airports Commission — The Metropolitan Airports Commission (MAC) recognizes pollution prevention as an integral part of its services. MAC's strategic plan reflects its commitment to environmental protection with the stated goal of establishing sound environmental strategies that lessen adverse environmental impacts on the natural environment and the surrounding communities. The commission encourages tenants to do the same. MAC also promotes taking a proactive approach to environmental protection and supports cooperation with other regulatory agencies.

Purchasing/procurement. MAC has been able to prevent pollution by implementing several purchasing policies. Policy dictates that recycled content paper is used with few exceptions. For instance, reuse is promoted internally through a policy of the purchasing department, and a procedure has been established outlining the steps to take when MAC-owned property is no longer needed by a particular department. MAC's new p-card program allows employees to purchase goods and services with a credit card, eliminating invoices in most cases, as well as the paperwork required to process thousands of payments. This program has streamlined the purchasing/accounts payable process. In addition, the new procedure has dramatically reduced the amount of paper used. Surplus equipment was previously sold by sending lengthy descriptions, bid sheets, as well as terms and conditions, to numerous recipients on a mailing list. More recently, the use of an Internet auction site has allowed MAC to reach a great many more potential bidders, eliminate the large and frequent mailings, thereby reducing paper usage. It is probable that selling prices are higher using this method. (See also sections 21, 22, 28 and 30 in Part 3.)

Technology and accepted practices. With the advent of internal and external electronic mail capabilities, MAC has embraced its use for many purposes. E-mail is a quick and efficient means by which people within and outside organizations communicate. Yet, it is also an effective way, when used properly, to reduce the amount of paper consumed. It has become MAC's accepted practice to use e-mail in this manner for notices such as job postings, organizational updates, press releases, human resource announcements, etc. Before MAC had e-mail available (only 3 1/2 short years ago), every organization-wide notice was sent through interoffice mail on paper to each employee. Not only was this cumbersome, but a waste of paper as well. Now with the ability to instantly send messages via e-mail, paper notices have become essentially obsolete.

Similar to the use of e-mail is MAC's Intranet site. Here employees can electronically access many internal documents previously only available on paper. Multiple copies become unnecessary and employees can access them only if they are in need of the document. Not only is this more efficient and time saving, it also saves paper.

Regulatory activities. With the many and varied activities at MSP, as well as at the reliever airports, it is essential that MAC staff work closely with a variety of regulatory agencies in order to ensure pollution prevention. For instance, MAC works on an ongoing basis with the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Health to help the reliever airport tenants maintain or obtain compliance with existing regulations associated with their lease space activities. MAC also uses the services of the Metropolitan Council-Environmental Services (MCES) for treating glycol impacted storm water.

Metropolitan Council – Environmental Services — The new tag line of the council expresses the desire that the Twin Cities can be "one of the best places to live, work, raise a family and do business" and is a reflection of its overall Smart Growth policy. Smart Growth promotes activities and outcomes that are sustainable in development, transportation, affordable housing, and the environment. This is accomplished largely through policies, partnerships, and grants, and by providing information and technical assistance to local communities, not by enforcement.

The council has a general Environmental Sustainability Policy (Section 1-2) which addresses issues relevant to the entire region. The companion Environmental Sustainability Procedure (Section 1-2a)

addresses pollution prevention in day-to-day operations by the staff. The Industrial Waste and Pollution Prevention (IWPP) Section controls the use of the public sewer system in order to ensure compliance with local, state, and federal water quality regulations. See sections 11, 16, and 32 in Part 3 of this report for a complete description of IWPP's many activities that are relevant to pollution prevention.

Metropolitan Council – Transit Operations — Metro Transit is committed to excellence and leadership in protecting the environment. In keeping with its policy, the objectives are to reduce the amounts of hazardous waste that are generated at any of the facilities and to keep air emissions at a minimum. By successfully preventing pollution at its source, the agency will be able to increase its operational efficiencies and provide a safer and healthier environment for employees and customers.

The Metropolitan Council has a general Environmental Sustainability Policy (Section 1-2) which addresses issues relevant to the entire region. The companion Environmental Sustainability Procedure (Section 1-2a) covers P2 for council staff. Transit does not have any regulatory activities.

Minnesota State Colleges and Universities

Bemidji State University — Otter Tail Energy Services conducted an energy audit of the campus' electrical and water utilities. The results of the audit indicate that a retrofit investment of $133,000 would yield annual combined water and water heating savings of $64,000. A simple payback would be realized in just over two years. The estimated ten-year savings on the investment is over $500,0000. The electrical audit report is still pending. The cost of the audit was $20,000. The decision to proceed with the suggested retrofits will depend on the results of the electrical audit and the availability of funds.

Bemidji State University continues to require environmental courses for satisfactory completion of the Liberal Arts core. "Focus on the Environment" is one of seven areas in the university's Liberal Education Program. Students pursuing a bachelor's degree must take a minimum of one 3-credit course from this area.

North Hennepin Community College — NHCC has identified the sources of waste generation on campus and evaluated the waste stream from these sources. Plans have been developed and implemented to separate recyclable/recoverable items in these waste streams to make better use of resources. Recyclables such as aluminum, glass, cardboard, etc. have been recycled for several years here on campus. Office supply products such as file folders and binders are redistributed and reused when staff leave, retire, or clean out files.

St. Cloud State University (SCSU) — Pollution prevention continues to be a factor in purchasing and implementation of new procedures. Members of the SCSU staff are receiving an increasing level of training in the areas of pollution prevention and recycling. During the past year the services of an outside consulting firm, MacNeil Environmental Inc., have been expanded to better address this training issue. In addition, SCSU procurement policies demand office paper with 30 percent minimum total recycled content and 30 percent post-consumer fiber content. Bath tissue is 95 percent, or more, recycled/post-consumer fiber. Reduced paper use should result from electronic communication access and training that has recently expanded to include our custodians and maintenance craftspeople.

Department of Transportation — Mn/DOT is committed to lowering its waste disposal costs and liability and protecting the environment. In keeping with this commitment, we strive to use cost-effective and practical methods to reduce adverse toxic impacts from the transportation infrastructure on the air, soil and water.

Mn/DOT's environmental guidelines include the following:

- Lowering expensive disposal costs and liability associated with the use of hazardous and problem materials/waste. Reducing and eliminating the generation of waste through research, design and field operations.
- Identifying and implementing pollution prevention opportunities by involving all employees. These opportunities include new methods, technologies and product substitution.
- Seeks to demonstrate its commitment by adhering to all environmental regulations.
- Promotes cooperation and coordination between government and the public toward the shared goal of preventing pollution and conserving our environment.

University of Minnesota

UNIVERSITY OF MINNESOTA BOARD OF REGENT'S POLICY

Pollution Prevention and Waste Abatement
Adopted: June 11, 1992
Supersedes: Waste Abatement Policy 12/15/85

CONSERVATION
Pollution Prevention and Waste Abatement

The University of Minnesota is committed to excellence and leadership in protecting the environment. Our objective is to reduce all types of waste and emissions. We strive to minimize adverse impact on the air, water, and land through excellence in pollution prevention and waste abatement. By preventing pollution at the source, we can save resources, increase operational efficiencies, and maintain a safe and healthy workplace for our students and employees. By abating those wastes that cannot be eliminated at the source, we can recover useful resources and reduce the environmental and economic burden of waste disposal.

We believe that environmental protection is everyone's responsibility. Its manifestation is valued and displays commitment to the University.

The University of Minnesota will achieve pollution prevention and waste abatement under the following guidelines. We will:

- Include the reduction of both hazardous and nonhazardous wastes and emissions at the source as a prime consideration in teaching, research, service and operations. The University is committed to identifying and implementing pollution prevention opportunities through encouragement and involvement of all students and employees.
- Give top priority to technologies and methods that substitute nonhazardous materials and utilize other source reduction approaches in addressing all environmental issues.
- Vigorously pursue waste abatement programs such as recycling, reuse, and purchase of recycled materials to reduce the need for disposal of waste that cannot be reduced at the source.
- Encourage pollution prevention and waste abatement through changes in purchasing policies and specifications.

The University of Minnesota seeks to demonstrate its leadership role in the State of Minnesota by aggressively adhering to all environmental regulations. We promote cooperation and coordination among higher education, industry, government, and the public toward the shared goals of preventing pollution and abating waste.

Therefore, be it resolved, that the Board of Regents directs the President to establish effective pollution prevention programs and to develop policies, plans and resources to achieve that goal.

Part 3

Pollution Prevention Activities during the Fiscal Year 2001

Part 3 contains information about the pollution prevention activities practiced by the participating agencies. The information is organized into sections by category of material, listed alphabetically. All individual agency summary reports that address pollution prevention measures for a given material are listed in the same order as in Part 1.

1. Absorbents

Department of Administration — The Travel Management Division uses absorbents to clean oil/antifreeze spills on the shop floor. The Materials Management Division's Surplus Services Section uses absorbents to clean oil/antifreeze spills. The Plant Management Division uses absorbents to clean oil/antifreeze spills and recycles the absorbent.

Department of Corrections

MCF-Oak Park Heights (MCF-OPH) — Rags are used to clean up spilled inks which are first scraped up and put into "wet scrap" for disposal with the institution's waste barrel. The industry office estimates that spillage amounts to less than one gallon per year. Absorbents are used to clean up any spills in the garage and yard equipment areas.

MCF-St. Cloud (MCF-SCL) — Absorbents are on hand and ready for use at an annual cost of $300. This keeps hazardous waste out of the landfill and in compliance with the MPCA. MCF-SCL plans to continue its compliance effort.

MCF-Rush City (MCF-RC) — This facility has a contract with Onyx Environmental Services to dispose of absorbents.

MCF-Shakopee (MCF-SHK) — SHK staff use absorbents in maintenance shops for oil-based products. The program is set up with Safety Kleen, which handles oil products in a safe way, benefiting the environment. The annual cost is approximately $250.

MCF-Stillwater (MCF-STW) — Absorbents are used in various industry shops. Shop supervisors regulate the use of this product in an ongoing effort to reduce its use. The waste is disposed of in accordance with the EPA/MPCA regulations.

Willow River/Moose Lake (MCF-WR/ML) — Both facilities collect stain/oil/solvent-soaked absorbents.

Metropolitan Airports Commission — MAC continually evaluates a variety of absorbents. Currently, corncob fractions, clay floor-dry, and disposable rags are used to absorb oil and grease in the maintenance shop. Also, although MAC is not responsible for any aircraft fueling operations or related spills, it does provide corncob fractions to its tenants, which are used exclusively to absorb spilled jet fuel. Booms are also used as a stopgap to prevent miscellaneous debris and other contaminants from reaching the river. The sorbents are saturated as much as possible before disposal. The spent absorbent materials are managed as nonhazardous industrial waste and are burned for energy recovery.

Metropolitan Council – Environmental Services — With the change in state regulations on the disposal of used oil absorbents, MCES has switched from a clay-based inorganic product to Spill-Dri™, a material made from 100 percent reclaimed natural fiber cellulose. In many other applications, polypropylene pads are used as absorbents. Products that are absorbed are primarily hydraulic fluids, crankcase oils, and other lubricating oils.

The larger facilities send the used absorbents via OSI Environmental, Inc. to be burned as a fuel for energy recovery. Two MCES facilities have industrial wringers that squeeze the oil from the synthetic pads, allowing their frequent reuse. Another facility has analyzed its used absorbent for Toxicity Characteristic Leaching Procedure (TCLP) heavy metals. Since none of the listed thresholds were exceeded, the absorbent is handled along with industrial codisposal waste with the approval of the regulating county. For 2000, 727 gallons of used absorbents were sent for energy recovery, a reduction of 28 percent from the previous year.

Metropolitan Council – Transit Operations — In 1996, Metro Transit switched from the use of clay-based absorbents to a cellulose type of absorbent. The change was made after reviewing the comprehensive studies and report done by the Minnesota Department of Transportation (MnDOT). An in-house comparison of absorbents validates the effectiveness of the selected absorbents. The change has eliminated over 8,000 pounds of clay from the waste stream and has diverted used absorbents from being sent for use as a fuel.

Minnesota State Colleges and Universities

St. Cloud State University (SCSU) — Absorbent pad and pans or other similar products and launderable rags are increasingly available and used at SCSU. Absorbent materials to contain hazardous chemical spills near floor drains are being supplemented with drain covers and increased training and inspections.

Department of Transportation — In 1995, Mn/DOT stopped landfilling clay-based used oil sorbent material. The sorbents currently used are used either as a waste derived fuel for the generation of steam and electricity, or cleaned and reused. Mn/DOT continues, on a small scale, to use launderable rags. Mn/DOT has found that the single largest factor in reducing an absorbent waste stream is reuse. It is important to use absorbents to their full potential prior to discarding.

University of Minnesota — Vehicle fleet operations use absorbent pads to clean up small routine spills, in place of and/or in combination with floor-dri. The pads are laundered and reused. Absorbent disposal has been cut by several (5 to 10) drums per year. Printing and Graphic Arts and Studio Arts use rags for printing operations cleaning. The rags are centrifuged to remove solvents as needed and then laundered for reuse.

2. Adhesives

Department of Administration — The Division of State Building Construction specifies materials such as fiber-based fabrics, adhesives, carpeting, and upholstery that do not contain toxins or formaldehyde.

Department of Corrections

MCF-OPH — The industry programs use environmentally safe glues including a natural animal products glue. The physical plant department uses the least polluting adhesives possible to accomplish the task at hand. All old, partially used buckets of adhesive that have accumulated over

the years will be lab-packed and disposed of through Onyx Environmental on September 1.

MCF-STW — Adhesives are used in the VT carpentry, upholstery, and furniture shops. These shops now use improved products and effective handling procedures that nearly eliminate waste. If waste is generated, it is disposed of in accordance with EPA/MPCA regulations.

Other facilities replied they do not use adhesives extensively or purchase only what is needed and used at the time.

Minnesota State Colleges and Universities

North Hennepin Community College — NHCC uses several types of adhesives, primarily in the art and plant services departments. Every effort is used to properly control product and follow manufacturer recommendations to ensure all adhesives are completely used and are handled correctly to avoid being wasted.

3. Air Quality, CFCs

Department of Administration — The Division of State Building Construction monitors statewide asbestos control programs based on federal and state standards; and also administers, specifies, and carries out air quality standards. The Plant Management Division recovers and recycles all refrigerants and plans to retrofit existing chillers with non-ozone depleting 134a refrigerant. The InterTechnologies Group requires vendors to comply with federal and state refrigerant recovery statutes for air conditioner refill or replacement.

Department of Commerce — Minnesota Energy Code. See section 11 *Education, Communication and Training* in Part 3.

Department of Corrections

MCF-LL — A new program was implemented in 2000 concerning CFC compliance with the EPA. A refrigerant mechanic performs preventive maintenance on all facility equipment containing refrigerants, as well as equipment inventories, refrigerant management, EPA compliance, and equipment upgrades. The goal is to reduce the amount of CFCs emitted into the atmosphere through mechanical upgrades, better preventive maintenance practices, and the elimination of CFC-containing equipment.

MCF-OPH — Refrigerant oil is recycled with the rest of OPH's waste oil and picked up on an as needed basis. A refrigerant reclaimer is used to reclaim Freon. Two staff were trained and EPA certified to reclaim refrigerant and charge refrigerant. However, due to conservation practices, refrigerant has not had to be reclaimed. Non-CFC refrigerants are used where possible. Future plans call for phasing out all CFC refrigerants.

MCF-RC — A refrigerant reclaimer is used to reclaim Freon. A staff person certified on applicable refrigeration and air conditioning units uses the reclaimer.

MCF-SHK — All refrigeration and air conditioning equipment owned or purchased by SHK has been converted to newer refrigerants that are safer for the environment. SHK does preventive maintenance and leak detection on all refrigeration equipment.

Metropolitan Airports Commission — Maintenance performed on any system containing CFCs includes complete recovery and recycling of refrigerants by certified technicians. Appliances containing refrigerants are recycled through an approved vendor.

Metropolitan Council – Environmental Services — With the implementation of the federal Clean Air Act Amendments of 1990, all chlorofluorocarbons (CFCs) from vehicles and stationary units have been recovered for reuse or recycling since the 1992 effective date. MCES has two recovery and reclaiming units, and five pipe fitters who are licensed CFC technicians. CFC-12, CFC-22, and more recently, the acceptable HFC-134a and MP-39 are recovered and reused.

Metropolitan Council – Transit Operations — In 1995, the Minnesota Pollution Control Agency (MPCA) required that Metro Transit apply for air discharge permits as mandated by the Clean Air Act Amendments. Subsequently, a complete stack inventory was conducted at all six garage facilities. In 1997, Metro Transit was issued permits for three of those locations. A review of the air emissions has shown that the permits were required at two of those garages because of the size of the dual fuel boilers that were installed.

In 2000, Metro Transit submitted for a Class D air permit for the new garage it was building in St. Paul and would be opening in 2001. This permit was issued by the MPCA in 2001 making a total of four permitted buildings. Because of this fact, no additional reductions can be made at those garages. The fourth permitted facility, the Overhaul Base, is regulated due to the air emissions from the boilers and the exhaust from the paint shop and paint spray booth.

Minnesota State Colleges and Universities

North Hennepin Community College — NHCC considers indoor air quality a high priority. Air quality sampling has been performed on problem/suspect areas with corrective action taken to prevent reoccurrence. Several of the older buildings have been renovated over the past five years with new higher efficiency air handling units installed that provide for better air filtration and increased fresh air supplied to interior spaces of these buildings.

CFC refrigerants are used on campus in central plant chillers (R-22), and several smaller air-conditioning (R-22) and refrigeration units (R-12, 22). No supplies or stocks of refrigerant are kept on campus. This type of work is performed by qualified outside contractors.

St. Cloud State University (SCSU) — SCSU continues to go beyond recycling Freon. A central chiller plant costing over $3 million is now online. It has added capacity to existing systems and reduced CFCs by using R22 refrigerant. The university has been able to continue the retirement process for cooling towers and R12 and R113 chillers as more buildings are linked to the chilled water system.

Department of Transportation — Mn/DOT uses environmental friendly 134 refrigerant in all vehicle air conditioners. CFCs in all Mn/DOT vehicle and building air conditioners are being phased out as warranted by repairs.

University of Minnesota — The university's Twin Cities campus has remodeled two of its coal-fired steam plants to use multiple fuel types and has shut down a third. The result is a reduction of sulfur dioxide (SO_2) emissions from approximately 600 tons per year (tpy) to approximately 110 to 250 tpy, nitrogen oxide (NOx) emissions from approximately 1,370 tpy to 280 to 310 tpy, and carbon monoxide (CO) emissions from approximately 280 tpy to 130 to 150 tpy. (Results vary depending on the ratio of fuel types used—gas, coal, or oil—in the modified plants. Use of natural gas maximizes the environmental benefits of reduced air toxics emissions. The current fuel plan is to use a minimum of 70 percent natural gas.

Facilities Management Energy Systems has created an Energy Efficiency Group whose mission is to reduce the Twin Cities campus energy consumption while maintaining or improving occupant comfort. Three components of the group's Energy Efficiency Program (whose goal is to reduce

steam and electrical plant air pollution by conserving energy) are optimum energy management, building system analysis, repair and upgrade, and energy awareness campaign

Optimizing energy use requires the coordinated efforts of many Facilities Management staff, including building system technicians, engineers, pipe fitters, mechanics, zone supervisors and energy specialists. Each profession contributes information, skills and expertise needed to improve building energy efficiency. The technology hub of our optimization program is the Building Systems Automation Center (BSAC), which electronically monitors and controls heating, ventilation and fire alarm systems in about 150 campus buildings. The Energy Efficiency Program has developed "University Building Efficiency Recommended Guidelines" to assist building managers and Building Systems Automated Control operators to maintain building energy use at the lowest level consistent with occupancy scheduling and comfort. Facilities Management employs energy management specialists who are certified commercial energy auditors to perform energy audits to identify building system equipment and controls that need updating or calibrating. Energy-saving projects are typically funded through internal loans and paid back with the savings from the energy budget.

The energy awareness campaign promotes energy conservation practices across the Twin Cities campus. Their efforts have reduced steam use on the Minneapolis campus central steam system by 20 percent, which translates to a 20 percent reduction in steam plant air emissions. Through energy conservation and the Energy Efficiency Program, overall energy consumption has decreased 12.7 percent since 1991, with energy cost savings of $1 million each year since 1995. An important part of the program is working with energy suppliers such as Xcel Energy and Reliant Energy to ensure that the university is taking full advantage of energy-saving programs and rebates offered by suppliers. Recently Reliant Energy presented the university with a rebate check for $225,000 as the result of the purchase of an energy-efficient chiller for the West Bank, which also will saves the university $200,000 per year in avoided costs.

The university's Center for Diesel Research focuses on reduction of diesel exhaust emissions from mobile and stationary engines (http://www.me.umn.edu/centers/cdr/index.html). Its mission is to:

- develop new technology to reduce occupational and environmental exposure to internal combustion engine emissions
- evaluate the application of emission control strategies in confined spaces such as mines and densely populated areas
- offer unique educational and research opportunities to students
- provide high quality research and development services to customers such as engine and exhaust after-treatment manufacturers, the petroleum and alternative fuels industries, and users of internal combustion engines
- offer educational opportunities through outreach programs and short courses

The Department of Parking and Transportation Services, Twin Cities Campus, specified in their contract with First Student Lines, that all buses used on the campus meet EPA 1997 emission limits for metropolitan buses and any stricter, future EPA limits. Normally First Student Lines would not need to comply with these strict limits, because they fall into a less regulated category of school buses. The contract also specifies financial penalties, such as $50 a day for every incident of a bus having visible exhaust emissions.

There is ongoing CFC and HCFC capture and reclamation for cooling units. As units are serviced, their CFCs/HCFCs are captured, then placed back in the unit. White goods are shipped to certified recyclers who recover CFC/HCFC prior to disposal. Annually the Twin Cities campus recycles

(recovers then places into other units) approximately 300 pounds of R22 and 50 pounds of R12. Thousands of pounds of university refrigerants have been recovered and put back into the original units by facilities personnel after servicing, or recovered by off-site contractors.

With the heating plant modifications, there is a reduction of approximately 1,560 to 1,680 tpy of SO2, NOx, and CO emissions. Reduced energy usage requires less steam and electricity generation which means less pollution emitted to the air. Reduction of diesel exhaust emissions makes for a cleaner and healthier air to breathe. The CFC and HCFC capture and reclamation program reduces emissions of global warming chemicals.

4. Antifreeze

Department of Administration — The Travel Management Division replaces antifreeze on an as needed basis, rather than as scheduled maintenance. Used antifreeze is collected and recycled. The InterTechnologies Group uses glycol for the cooling loops for the stand-alone air conditioners for the three computer operations centers. The Plant Management Division collects and recycles antifreeze on a voluntary program and will maximize recovery by January 1, 2000.

Department of Corrections

Most facilities take vehicles to local automotive shops for antifreeze testing and replacement. The automotive shop recycles the antifreeze in accordance with MPCA rules and regulations.

MCF-STW — Antifreeze is used in most STW vehicles. It is recycled for reuse when possible. If waste is generated, it is disposed of in accordance with EPA/MPCA regulations.

Metropolitan Airports Commission — MAC maintenance shop is equipped with two antifreeze/engine coolant recyclers. At regular maintenance intervals, coolants are removed, processed, and returned to vehicles. The recycled antifreeze is supplemented with anti-corrosion additives and the pH is adjusted. This meets all manufacturer specifications for engine coolant. Very little new antifreeze is purchased and virtually no antifreeze is disposed of. Extended life coolants are used whenever possible.

Metropolitan Council – Environmental Services — At the Metropolitan Wastewater Treatment Plant (Metro WWTP; St. Paul, Ramsey County), a decision has been made to purchase "long life" antifreeze/coolant which is changed at intervals of 150,000 miles. The majority of vehicles, particularly General Motors products, have this long life liquid. This will significantly reduce the volume that is disposed of in the sewer. A state law passed in 1998 allows facilities generating an average of less than 50 gallons per month of antifreeze/coolant to dispose of it in the sewer provided that the volume is tracked and it is not prohibited by the operator of the collection or treatment system. All MCES facilities fall into this category.

Metropolitan Council – Transit Operations — In January 1997, Metro Transit instituted a formal policy on the handling of all used antifreeze/coolant. This calls for storing the used material in 55-gallon drums and then having it recycled.

Minnesota State Colleges and Universities

North Hennepin Community College — The college no longer uses antifreeze to winterize cooling coils. A different method used last year has shown favorable results and will be continued. Small quantities of automotive antifreeze from lawn equipment is brought to a local recycler.

Department of Transportation — Most of Mn/DOT does not produce significant amounts of antifreeze, rarely changing out the old antifreeze. If a part needs to be changed, the old antifreeze is collected, temporally held, and refilled into the vehicle.

Mn/DOT has researched, identified and implemented various recycling options for antifreeze. However, due to cost, most of Mn/DOT's biodegradable antifreeze is disposed of in the sanitary sewer with permission from the POTW. Some antifreeze generated by Mn/DOT is recycled through a filtration technology located in Crookston. The recycled antifreeze is used in Mn/DOT vehicles.

University of Minnesota — The university's Fleet Services Department on the Twin Cities campus rarely removes automotive antifreeze, rather they top off radiators with fresh antifreeze, then sell vehicles after three to five years.

5. Audits

Department of Corrections

MCF-OPH — The facility safety officer inspects monthly for a variety of fire, safety, and sanitation items which include an inspection of hazardous materials, inventory lists, and disposal procedures. The Washington County HELM representative conducts an annual hazardous waste inspection, including a review of MCF-OPH's disposal procedures, to ensure they meet all guidelines. He has consistently commended the facility for its attention to materials handling and disposal procedures. The Department of Health and State Fire Marshal conduct annual inspections of the facility.

MCF-RC — Our safety committee inspects monthly for a variety of fire, safety, and sanitation items, which include an inspection of hazardous materials, inventory lists, and disposal procedures.

MCF-SCL — Environmental audits are ongoing in accordance with MPCA, ACA, and OSHA requirements at a cost of $4,000 annually. This helps identify and/or eliminate waste streams. MCF-SCL plans to use outside contractors to conduct audits in the future.

MCF-SHK — Scott County conducts a Hazardous Waste audit once a year. MCF-Shakopee obtains a Hazardous Waste permit annually.

Metropolitan Airports Commission — MAC is continuing to conduct environmental compliance inspections at the six reliever airports. These inspections help identify possible environmental issues and assist reliever airport tenants in achieving and/or maintaining compliance with existing regulations. They have also allowed MAC to educate its tenants of the environmental impacts their actions may have and to help them improve their waste generation/disposal practices. This program is ongoing by design. MAC staff continues to provide education/training and technical support to the reliever tenants. An example of this is the cooperative efforts between the MPCA and MAC to hold informational meetings with reliever tenants to assist tenants with the Storm Water Permitting process. Opportunities for pollution prevention are noted and incorporated in the Capital Improvement Process as indicated by MAC's strategic plan. MAC routinely inspects and continuously audits its own operations in an effort to recognize and take advantage of any pollution prevention opportunities. Outside sources, such as Minnesota Waste Wise and MnTAP assist with annual site visits followed by recommendations for waste reduction/pollution prevention.

Metropolitan Council – Environmental Services — Within the environmental audit program conducted by MCES staff, opportunities for P2 are always noted and are included as recommendations in the audit findings. For example, the evaluation of chemical products for the presence of compounds that are categorically hazardous could result in choosing product alternatives

that may not be characteristically hazardous. Recommendations also have been made for materials management in order to avoid spills. The ongoing audit program is scheduled to examine environmental compliance at all facilities once every two to three years.

Metropolitan Mosquito Control District — The district team responsible for management of hazardous materials and pollution prevention, conducts annual internal audits regarding the management of hazardous waste and toxic materials at each of its seven facilities. The audits include review of storage and handling procedures for hazardous materials, record keeping, transfer, and labeling of waste materials, and recycling/disposal procedures. In addition, the team reviews and makes recommendations regarding efforts by the facilities to reduce or eliminate the use of toxic materials.

Minnesota State Colleges and Universities

Bemidji State University — Otter Tail Energy Services conducted an energy audit of the campus's electrical and water utilities. The results of the audit indicate that a retrofit investment of $133,000 would yield annual combined water and water heating savings of $64,000. A simple payback would be realized in just over two years. The estimated ten year savings on the investment is over $500,0000. The electrical audit report is still pending. The cost of the audit was $20,000. The decision to proceed with the suggested retrofits will depend on the results of the electrical audit and the availability of funds.

St. Cloud State University (SCSU) — MacNeil Environmental Inc. has performed increased environmental audit functions as part of their Environmental Health and Safety (EHS) contract with SCSU. These relate to elements of hazardous waste disposal, storage tanks, and the OSHA laboratory standard, which encompass pollution prevention. SCSU's Chemical Hygiene Officer (CHO) has received specialized off-site training and has become increasingly instrumental in hazardous waste audits, waste prevention planning, and hazardous waste removal. Departmental support, staffing focus, and investigative activities in these areas have also increased.

SCSU also has continued to implement the suggestions of a recent MnSCU facilities condition survey. The survey's environmental recommendations included specific purchases and capital/repair projects. These affect HVAC and electrical system revisions and both energy and water conservation measures. The university is continuing to benefit from their insights.

Department of Transportation — Mn/DOT conducts approximately 30 internal waste stream audits annually of Mn/DOT facilities. The purposes of these audits are to:

- evaluate Mn/DOT's hazardous and problem waste stream management methods
- identify various pollution prevention opportunities that warrant further research
- evaluate potential areas of noncompliance with state and federal hazardous and solid wastes, tanks, and water quality laws and rules
- make recommendations to correct and/or avoid potential areas of noncompliance
- make recommendations to maintain an effective waste management program

Mn/DOT annually conducts 10 to 15 external environmental audits of facilities that handle Mn/DOT wastes. The purpose of these audits is to evaluate potential and existing waste handling, storage, recycling, and disposal sites. This evaluation is based on a facility's waste management procedures, pollution prevention practices, compliance records, site geology, and financial strength. These audits help determine if the amount of environmental risk and liability associated with using a particular site is acceptable to Mn/DOT.

Both Mn/DOT's internal waste stream and external environmental audit programs have costs associated with them. However, based on Mn/DOT's experience, the cost of the program is minimal compared to the cost associated with potential Minnesota Pollution Control Agency enforcement actions and potential environmental liability (Superfund). Both Mn/DOT's internal waste stream and external environmental audit programs offer environmental benefits in that they ensure that Mn/DOT waste is being managed in an environmentally sound manner.

University of Minnesota — The University Department of Audits checks departments to see if they have hazardous waste compliance protocols (which includes pollution prevention) and OSHA laboratory standard protocols in place.

The University of Minnesota's Department of Environmental Health and Safety (DEHS) does targeted audits of large and/or noncompliant departments. All departments are directed to minimize waste and prevent pollution via self-audit. The training and audit form is currently available on the Web through the DEHS homepage (www.dehs.umn.edu/hwd/guidebook/guidebook8.html) and in the *Hazardous Chemical Waste Guidebook*.

6. Automotive Fuels

Department of Administration — The state purchased 210 Ford Taurus 2000 model year cars and 85 Dodge Caravan 1999 model year bi-fuel passenger vans which use E85 (85 percent ethanol fuel). This is a total of 315 alternative fuel vehicles. Of these, 185 Tauruses and 61 Caravans were purchased for the Travel Management Division. The CPV members purchased 65 Ford Tauruses and 10 Dodge Caravans. The Travel Management Division uses ethanol 85 fuel as an alternative energy source with reduced emissions. This facility is available to all state agencies and political subdivisions.

Department of Commerce — The department is an active member of the Twin Cities Clean Cities Coalition (TC4), which was officially designated as part of a formal Department of Energy alternative transportation fuels program on May 31, 2001. The TC4 program is a comprised of government, private, and nonprofit organizations dedicated to promoting alternative transportation fuels. The department has especially promoted the use of E85 (85 percent ethanol mixed with 15 percent gasoline) with funding and informational materials. Currently, there are over 60 E85 stations pumping approximately 60,000 gallons of E85 per month. The use of biodiesel in diesel fuel applications is an additional target for promotion in the future. The department will continue to play an active part in the development of TC4 and the promotion of its objectives in fiscal year 2002.

The department also acts as the central coordinating entity for state agencies that fall under a federal mandate (Energy Policy Act) to acquire alternative fuel vehicles (AFV). An effort was made over the last year to reevaluate the affected agencies and work to meet the 75 percent light-duty AFV acquisition requirement in the future. The number of agencies that fall under the Energy Policy Act mandate increased from three to eight agencies under the reevaluation.

The department leases 25 cars through Travel Management, 6 of which are E85 capable, and 16 of which are non-E85 capable but are in the same size category as an E85 vehicle. As these 16 vehicles turn over, the department will look toward adopting E85 vehicles. In addition, the Weights and Measures Division will investigate the use of the GM F150 pickup for use in their heavy-duty trucks used in gasoline and diesel fuel testing. Encouraging the use of E85 fuel in these vehicles will be an ongoing educational effort with departmental drivers.

Department of Corrections

MCF-OPH — Gasoline for the vehicles and diesel fuel for the Industry truck are purchased at a local station. The diesel fuel used by the groundskeepers is stored on-site in an aboveground tank on a pad. Since OPH is in a municipal area, using local stations eliminates the need for having on-site fuel tanks.

MCF-RW — Fueling of state vehicles is done at the facility, which has a 1,000-gallon aboveground concrete tank with spill containment and leak detection.

MCF-SCL — Ninety-five percent of fueling is done at a public station. It costs five cents more per gallon of fuel but limits chances of fuel spills, explosions, and tank maintenance. Only fuel plant operation vehicles are fueled on-site. The facility plans to continue monitoring.

Most other facilities use local filling stations for automotive fuel supply. It is easier, and many facilities use a credit card for gas thereby having a more accurate financial record.

Metropolitan Airports Commission — MAC is currently evaluating the opportunity to participate in a propane fueled vehicle demonstration/project. At this time there are no other alternative fuel applications that meet operational requirements.

Metropolitan Mosquito Control District — As a pollution prevention activity for 2002, MMCD will begin replacing some of the older fleet vehicles with new flex fuel vehicles capable of using E85 ethanol blended fuels. MMCD hopes this activity will begin to reduce the amount of motor vehicle emissions generated by the MMCD fleet. There are concerns by staff that the reduction in mileage will mean increased costs and the availability of E85 fuel will pose problems for some MMCD facilities. Currently MMCD specifies gasoline that contains ethanol for use in district vehicles.

Minnesota State Colleges and Universities

Bemidji State University — Boat motor fuel will instead be purchased at local gas stations.

North Hennepin Community College — The college no longer has an underground gas storage tank. Fuel for grounds equipment is stored in an aboveground 250-gallon diesel tank which has spill containment. Gasoline for small equipment is kept in approved safety cans and stored in an approved safety cabinet.

St. Cloud State University (SCSU) — SCSU motor pool has four alternative fuel (ethanol E-85) autos, which produce limited carbon monoxide.

Department of Transportation — Mn/DOT is purchasing heavy equipment pieces that contain computer-controlled electronic ignitions that maximize vehicles' fuel efficiency. Mn/DOT is purchasing lightweight aluminum wheels for its trucks for fuel economy.

University of Minnesota — In the fall of 2000, the Department of Fleet Services, Twin Cities Campus, installed a 6000-gallon E85 fueling station and purchased 47 flexible fuel vehicles that can use this environmentally friendly fuel. E85 is a renewable fuel made in Minnesota from corn and other agricultural products. E85 has many benefits as a renewable energy source. It helps create a cleaner environment, healthier air, and a stronger U.S. economy, while reducing overseas oil imports. Production and use of E85 instead of gasoline results in a 35 percent reduction in greenhouse gas emissions. E85 also reduces harmful exhaust emissions by more than 50 percent. Fleet Services has also added the Toyota Prius hybrid electric/gasoline car to its rental fleet.

The Power and Propulsion Division, Dept. of Mechanical Engineering, on the Twin Cities campus, tests engine efficiency and emissions of gasoline and diesel powered engines and offers technical assistance, for a fee, to agencies or companies researching performance of automotive and diesel

engines (www.me.umn.edu/divisions/#PnP). Center for Diesel Research (www.me.umn.edu/centers/cdr/index.html) is a good resource of information on test procedures and simple maintenance that can greatly reduce diesel emissions from buses and trucks. Proper choices and use of fuels help reduce air emissions from automobile and bus exhausts and reduce fuel consumption. The Department of Parking and Transportation Services received the 1997 Minnesota Government Reaching Environmental Achievements Together (MN GREAT) pollution prevention award for their ongoing efforts to reduce automobile wait times in parking lots through modifying software controlling access into and out of parking lots. Gate controllers annually reduce gasoline use by about 2,000 pounds and prevent approximately 7,000 pounds of carbon dioxide emissions.

7. Automotive Maintenance

Department of Administration — Materials Management Division (MMD) specifies remanufactured automotive products. The division has also developed contracts for remanufactured automotive products for state agencies, which included diesel engines, transmission, alternators, and starters.

The Materials Management Division and the State Patrol's contract to refurbish and reuse the State Patrol's 1995 Chevrolet Caprice police automobiles is completed. The Patrol refurbished 137 police vehicles at an approximate value of $1,800,000; political subdivisions refurbished 27 vehicles at an approximate value of $365,000. The estimated savings, in lieu of purchasing new vehicles at $20,334 each, averaged $7,700 each, The State Patrol saved a total of $1,055,000 and the political subdivisions saved $208,000. The Refurbishing State Patrol Vehicles Project was awarded a 1999 Partnership Minnesota Cooperative Certificate of Commendation for Government and Environment. The Materials Management Division also nominated this project to the National Association of State Procurement Officials for the Cronin Club Innovation Award in September 1999.

The Travel Management and Plant Management divisions' preventative maintenance program are designed to minimize excessive and/or premature replacement of parts. They also use remanufactured parts whenever they are available. The Travel Management Division recovers and recycles automotive refrigerants; they are recycled on-site at the repair facility.

Department of Commerce — All vehicles are serviced regularly either through Travel Management or through other maintenance arrangements.

Department of Corrections — For automotive maintenance work, most facilities take vehicles to local vendors, such as rapid oil change stations, Central Motor Pool, or local automotive dealers, depending on ownership. These local vendors have on-site pollution prevention facilities and handle all the appropriate recycling or disposal. This also eliminates the need to store potentially hazardous automotive maintenance products that are infrequently used at correctional facilities.

Metropolitan Airports Commission — For specific information on automotive maintenance, see sections 1, 3, 4, 6, 8, 23, 25, 31, and 33.

Metropolitan Council – Environmental Services — For specific information on P2 at MCES in automotive maintenance activities, see the sections on absorbents, antifreeze, batteries, oil/oil filters, parts cleaning, and tires.

Metropolitan Mosquito Control District — All major automotive maintenance and repair is done through commercial vendors by way of special maintenance agreements. Only minor vehicle repair and maintenance is performed at district facilities. This would include oil and oil filter changes, spark

plug changes, and replacing some engine belts. The program to out source most of the vehicle maintenance has eliminated waste automotive chemicals and solvents from MMCD waste streams.

Minnesota State Colleges and Universities

North Hennepin Community College — Major repairs to vehicles are performed by automotive dealerships. Minor maintenance such as oil and filter changes are performed by qualified staff on campus. The used oils, filters, and antifreeze are recaptured by staff and sent to a local vendor for recycling.

St. Cloud State University (SCSU) — The SCSU vehicle repair shop has revamped procedures for brake pad/shoe replacement to ensure control of asbestos fiber release. Replacement pads do not contain asbestos. The shop also has switched to a water-based parts washer that generates only a small amount of sludge to be disposed of as hazardous waste.

Department of Transportation — Mn/DOT is purchasing brake cleaners that are less toxic and easier to manage as a waste. See also section 23, *Oil, Oil Filters* and section 25, *Parts Cleaning.*

University of Minnesota — The Department of Fleet Services, Twin Cities campus, uses a recycling service for their parts washer solvents. Oil and gas filters are crushed, the oil recycled, and the metal scrap recycled. Automotive lead-acid batteries and air conditioning refrigerants are also collected and recycled. Underground storage tanks for fuels have either been removed or upgraded to meet MPCA and EPA requirements, which will prevent contamination from leaking tanks.

Fleet Services has recently installed for evaluation a parts washer system using a proprietary solvent that is non-flammable and is perpetually cleaned by a recirculating filter system. Filters periodically need to be disposed of, but the solvent does not need to be shipped off-site for recycling/disposal. This system potentially will eliminate 240 gallons of solvent waste per year. This measure promotes resource conservation and the protection of groundwater.

8. Batteries

Department of Administration — The contract for automotive batteries has provisions for all state agencies to recycle batteries. The Travel Management Division recycles automotive batteries. The Materials Management Division procures only reduced or no-mercury batteries in accordance with Minnesota Statutes Section 115A.965, Subdivision 2 (see below). The mercury content in flashlight batteries has been either eliminated or reduced to negligible levels due to the Environmental Protection Agency's mandates in the late 1980s and early 1990s.

> Subd. 2. Total toxics concentration levels. The total concentration level of lead, cadmium, mercury and hexavalent chromium added together in any packaging must not exceed the following amounts:
>
> (1) 600 parts per million by weight by August 1, 1993;
>
> (2) 250 parts per million by weight by August 1, 1994; and
>
> (3) 100 parts per million by weight by August 1, 1995.

The Plant Management Division returns batteries from vehicles and janitorial equipment to vendors for recycling. The InterTechnologies Group uses recycled batteries for three uninterruptable UPS units that are located in the two computer operations centers in the Centennial Office Building and one uninterruptable UPS unit located in the Administration Building. The Plant Management Division participates in a voluntary "other" internal battery collection and disposal program.

Department of Commerce — The Weights and Measures Division continues to work with the Pollution Control Agency, mailing information to oil recycling stations about oil and lead-acid battery recycling. A battery recycling bin has been placed in the employee lunchroom.

Department of Corrections

MCF-LL — Batteries are returned to vendor for recycling when new batteries are purchased or collected and stored on site until recycled. The state contract requires the vendor to take back used batteries.

MCF-OPH — The type of alkaline batteries purchased by the facility can be disposed of in the trash. The lead-acid and nickel-cadmium batteries are saved and recycled as quantities dictate. Lead-acid batteries are taken to a recycling center by facility staff. The facility has moved to purchasing rechargeable batteries and recycles rechargeable batteries to the supplier in accordance with the state's contract.

MCF-RC — Used batteries are returned to vendor for recycling when new batteries are purchased or collected and stored on site until recycled. The state contract requires the vendor to take back used batteries.

MCF-STW — Batteries are used in all MCF-STW vehicles, as well as other various applications throughout the facility. Waste batteries are disposed of in accordance with EPA/MPCA regulations.

Office of Environmental Assistance — The OEA purchases alkaline rechargeable batteries and has been pleased with their performance. Rechargeable batteries are recharged as many times as possible and then collected for management by the Department of Administration's resource recovery program.

Metropolitan Airports Commission — MAC recycles all batteries. Spent lead-acid batteries are returned to the supplier for recycling. Nickel-cadmium, NiMH, lithium and alkaline batteries are collected by MAC electricians and recycled by an approved vendor.

Metropolitan Council – Environmental Services — Spent lead acid batteries (SLAB) are collected as a special hazardous waste and sent to battery recyclers. For most over-the-road vehicles, used SLABs are exchanged for new ones at the time of service. The used batteries that do accumulate and are stored for recycling are from heavy equipment, electric carts, and standby emergency electric power diesel-fueled generators. In 2000, MCES facilities recycled 8,364 pounds of SLABs—a reduction of 51 percent over the previous year—mostly through A-Battery City in Minneapolis.

Dry cell batteries that are currently standard issue contain less than 0.0025 percent mercury and therefore are not characterized as hazardous waste. The Metro WWTP warehouse normally dispenses over 3,000 pounds of AAA, AA, C, D, and 9V alkaline batteries in a year which now can be handled as regular solid waste. Nickel-cadmium batteries that are no longer capable of being recharged are accumulated for recycling through Superior Special Services in Bloomington. Dry-cell batteries that are older than the manufacturers' mercury restriction or cannot be documented to be low mercury still turn up and are stored until they can be disposed of as hazardous waste.

Metropolitan Council – Transit Operations — Metro Transit continues to recycle all of its spent lead acid batteries (SLABs) and dry cell batteries. This procedure has been in place since the 1960s.

Metropolitan Mosquito Control District — Spent lead-acid batteries are recycled through the district's battery vendor. As new batteries are purchased, old batteries are exchanged with the battery supplier for recycling. Dry cell batteries are collected at each district facility and recycled through

local recycling programs. MMCD uses rechargeable batteries for all sampling and collection equipment.

Pollution Control Agency — The Waste Reduction and Recycling Committee (WRRC) continues to coordinate its battery collection program in fiscal year 2001. The PCA collected 67 pounds of recyclable batteries (NiCd) and 90 pounds of vehicle batteries.

Minnesota State Colleges and Universities

North Hennepin Community College — All batteries are recycled. Every effort is made to ensure that when a new battery is purchased, the old one is brought in for exchange. Other batteries are recycled through a local contractor.

Department of Transportation — Mn/DOT sends all used nickel-cadmium, lead acid batteries, nickel metal hydride, mercury button, and lithium batteries to approved battery recyclers.

University of Minnesota — Facilities Management and the Department of Environmental Health and Safety (DEHS) collect mixed dry cell batteries from all campuses. Several types of used batteries are considered hazardous waste if not recycled; and most batteries will contribute metals to solid waste incinerator air emissions. Batteries are sorted by chemistry type and managed for recycling/reclamation where possible. Lead-acid batteries from various university operations are recycled. Rechargeable battery systems are used for various functions by departments.

In fall 2000, Facilities Management and DEHS reviewed and updated the battery collection program, purchased new collection containers and distributed them to all office recycling sites on the Twin Cities campus. The goal is to increase participation in the proper management of dry cell batteries, and indeed the amount of batteries collected has gone up 55 percent compared to the previous year.

9. Cleaning Supplies

Department of Administration — The Materials Management Division, with assistance from other state agency staff, developed specifications for environmentally safe products that have been incorporated into a cleaning supplies contract. This contract helps safeguard the health of custodial workers, building occupants, and the environment. All products were scored for environmental attributes based on criteria established by the Office of Environmental Assistance. The cleaning supply contract was awarded a 1998 Partnership Minnesota Cooperative Certificate Commendation for Government and Environment.

The Plant Management Division uses janitorial products that are appropriate to discard in sewers; uses chemicals packaged as concentrates to reduce packaging waste by 85 percent; and uses automatic dispensing systems to ensure correct dilutions from concentrates and minimize waste. The InterTechnologies Group refills small spray bottles with glass/desk cleaner from gallon containers to avoid the use of aerosol cans.

Department of Corrections

MCF-OPH — OPH purchases MINNCOR products, which are non-polluting and environmentally safe, as do other facilities. The concentrated cleaning products are individually packaged in a portion-controlled envelope that ensures a 1:1 ratio of pack to water for cleaning purposes. The product mixes with cold water. Portion Pac containers reduce solid waste. Other consumer product cleaning supplies, such as Pledge, are purchased as needed and stored in the area of use.

MCF-RW — RW is in the process of developing a new inventory and use program.

Minnesota State Colleges and Universities

North Hennepin Community College — Environmentally friendly cleaning supplies are used. MSDS sheets are maintained in each custodial closet, and safety procedures are adhered to when products are dispersed and used.

University of Minnesota — Facilities Management (FM), Twin Cities campus, initiated a program to centralize purchasing of custodial supplies in an attempt to reduce the number of different custodial products used by its employees. The goal was to optimize supply management and to enhance worker safety and environmental friendliness through a product selection process. FM custodial services cleaned out and disposed of old, unused custodial products from 900 custodial closets in the 250 buildings on campus.

FM formed a committee, the Material Review Board (MRB), comprised of both management and labor representation from each zone, safety, and purchasing for the sole purpose of improving the safety, health, and functionality for FM's custodial work force. A dominant cornerstone of the MRB's platform is to consistently improve upon, by careful evaluation and reduction, the inventory of approved cleaning products used by custodians. Reducing the number of approved custodial cleaning products completes two important objectives: first, it improves the safety and health of the end user by eliminating those products that have been evaluated as potentially harmful; second, it minimizes or simplifies the specialized training required for each product.

In 1999, MRB successfully reduced the number of cleaning products from 456 products to 150. In fiscal year 2001, the MRB made another impressive stride by reducing the 150 approved products to 51. A reduction of 66 percent! The approved custodial list of 51 products represent those products that are only to be used in the custodial cleaning process, any other product not identified on the approved list is considered unapproved and not cleared for use. Each of the 51 approved products went through a stringent evaluation and testing process.

When an individual or vendor wants a new product to be considered for inclusion into the approved list, they must go through the following process. First, the vendor approaches the supervisory staff and provides a cut sheet of the product, but they do not and are not allowed to drop off any product samples. The supervisor in turn provides the vendor with an evaluation packet called the Safety, Health, and Environmental Attributes Form that is to be completed by the vendor's resident chemist. This form is an important first step, because the product is evaluated and scored based on following categories:

- **Operational safety** looks at components such as the product's toxicological dosage levels, whether or not it is a registered carcinogen, its pH, and its flash points.
- **Ecological (environmental) stressors** examines what effects the product's constituent chemicals would have on the environment (based on a compiled list of products called the Minnesota Toxics Indexing System) if the product were disposed of in the waste stream. This category also looks at the percent of the ingredients that are made from plant sources and whether or not the product contains constituents that may have a negative effect on the ozone.
- **Product delivery/packaging** analyzes the product's dispensing features to determine dilution ratios to minimize handling exposure, material handling issues, and availability of product labeling to meet the specification of the Minnesota Employee Right to Know Act (MERTKA).
- **Dyes/fragrances** category identifies whether the product contains any artificial dyes or fragrances that may cause the end user hypersensitivity problems.

Once the vendor completes the form, it is submitted to the FM Safety Department, where it is in turn checked for accuracy and scored. The score is communicated to the members of the MRB, who then correspond with the vendor. A product that earns a failing score does not advance in the evaluation process. A passing score indicates that the product can advance to the functional testing portion and will be brought in front of the next MRB meeting.

At this MRB meeting, arrangements are made with the FM Purchasing Department to procure samples for which designated zone crews will test the product under objective criteria (which includes comparing it to a similar product already on the approved list) and provide their results at the next subsequent MRB meeting. At this meeting, a consensus is reached by the members to determine if the product is to be included onto the approved list. In order for a new product to get on the approved list an existing product must be removed.

In addition, MRB has embarked on the task of integrating the use of bio-based products into the custodial operations. Bio-based, or plant derived products, provide functionality that rival the existing line of approved custodial products while vastly improving the safety, health, and environment for the end user. A 1999 Executive Order from former president Bill Clinton set a goal of tripling U.S. use of bio-based products by 2010. MRB intends to accomplish this by 2005 by annually replacing 15 percent of the current approved product list with bio-based products.

Centralized purchasing of a more select list of custodial products leads to the cost efficiency of larger purchases. The custodial product selection process is designed to minimize air and water pollution and improve worker health and safety.

10. Commuting and Transportation

Department of Administration — The Materials Management Division, in conjunction with the InterTechnologies Group Telecommunications Division, has established a contract for Lucent equipment that offers both new and refurbished telecommunications equipment. Agencies can choose to purchase reused equipment.

Department of Commerce — The department began participation in the MetroPass program in 2000 to encourage employees to commute on MetroTransit buses. As of August 2001, 50 employees are participating, up from 47 in January. The department continues to maintain a carpool matching program on the internal web page, but participation rates are low.

Department of Corrections

MCF-OPH — Video conferencing has replaced travel in many instances as representatives of the various facilities meet via video conference to redraft policy, hold committee meetings, etc. thereby saving mileage and time. The facility safety officers, for example, hold many meetings via video conference. Hearing officers have used the system to conduct offender discipline hearings every other Thursday or approximately seven hearings a month; thereby saving them travel time and expense, and speeding up the discipline process. Video conference hearings between an offender and an out-of-county court have occurred.

MCF-RC — RC uses video conferencing whenever possible to cut back on gas usage and time spent on the road. The facility encourages carpooling for training classes, seminars, or travel out of area.

MCF-SHK — The facility has a bicycle rack and participated in BBOP day.

Office of Environmental Assistance — The OEA is continuing to test telecommuting for a few staff. These staff members work out of their homes one or two days per week. By not driving to work, they conserve fuel and reduce emissions from their vehicles. Regional OEA staff have frequent phone conferences with central office staff, thereby cutting down on travel.

OEA and PCA were the first public agencies in the MetroPass program in April 1999, and the program is ongoing. Under the terms of this program, employees are eligible to purchase an annual transit pass for an agency-subsidized rate. Employees may use the passes for commuting to and from the workplace, for business travel during the workday, and for personal travel at all other times when buses are running. The program raised OEA bus ridership from 5 percent to 16.6 percent.

Department of Human Services — DHS continues to promote telecommuting for those staff who are able to work at alternate sites. One telecommuting day per week is the usual arrangement, but some staff are able to telecommute several days a week. Flexible scheduling also allows many staff to eliminate one workday per week.

Metropolitan Council – Environmental Services — In 1998, a specific program—"Walk the Talk"—was aimed at promoting commuting options to MCES employees. Survey results from respondents indicated that 72 percent of employees drive alone to work with an average one-way commute of 14 miles taking 25 minutes. Dependence on the private automobile is not unusual in that most treatment plants are some distance from public transit routes. Among respondents to the same survey, 35 percent were willing to try the bus and 27 percent were willing to carpool. Employee awareness was increased during "Walk the Talk" week by publicity, commuting pledges, and drawings for prizes. Each year, MCES participates in the B-BOP (bus, bicycle, or pool) challenge in the spring for its employees and in 2000 joined the IPPAT interagency challenge. Eighty-two employees responded as "Team MC", saving a total of 1,709 miles (21 miles per person) in one day by taking alternatives to driving alone in a car such as walking, running, bicycling, carpooling and riding the bus.

Pollution Control Agency — MPCA continues to promote alternative transportation, including the annual BBOP Day promotion and the bike-car commuter race in which one bike won, and another two came within two minutes of the challenging car! The agency also provided *Bikeways* and *Bus Fare* newsletters, Metro Transit's MetroPass Program (about 12 percent of staff are regular bus riders), Guaranteed Ride Home Program, Special Off-Day parking, reserved carpool/vanpool parking/free on-street parking for registered carpools, and discounted bike lockers. Surveys and planning programs are also conducted. MPCA staff developed computer spreadsheets for individuals to estimate the cost of operating their personal vehicles. These are available to staff.

Minnesota State Colleges and Universities

St. Cloud State University (SCSU) — SCSU subsidizes bus passes for students and faculty, including evening transportation in the campus area.

Department of Transportation — Mn/DOT has installed various traffic lanes set aside for vehicles with multiple passengers and has set various park-and-ride sites that promote carpooling or busing. Mn/DOT has an active telecommuting promotion program focused on employees in the Twin Cities metropolitan area.

Mn/DOT continues to promote various alternative transportation options such as light rail, HOV, commuter rail, bus, bicycling, and pedestrian facilities and continues to partner with other state agencies, citizens, and local officials in setting up pilot projects to encourage alternative transportation.

University of Minnesota — The Twin Cities campus, which spans almost five miles from east to west, is host to nearly 80,000 arrivals per day. With a free intercampus bus system and a comprehensive tunnel and skyway system, students do not need a car once on campus. The Department of Parking and Transportation Services is continually studying and implementing new strategies to reduce automobile traffic to the Twin Cities campus and to more efficiently direct the flow of traffic and pedestrians when they reach the university. Employee and student population densities are mapped to show critical areas for mass transit lines. Routes for express buses have been maintained, in spite of shrinking state funding. Carpooling is actively promoted through advertisements, reduced parking rates, and preferential surface lot locations. Biking and walking routes are promoted with new signage and special lanes on university roads; and the Twin Cities campus uses a mass transit system to bus students, employees, and guests from parking lots to various locations on campus.

In the fall of 2000, the University of Minnesota, Twin Cities initiated a deeply discounted student, staff, and faculty bus pass program designed to reduce traffic congestion, ease parking shortages and improve the environment through increased bus ridership. The passes (U-Pass for students and the MetroPass for staff and faculty) make public transit affordable and allow unlimited rides anywhere, any time, on any Twin Cities bus system for a fraction of the cost.

The university has received a $5.5 million federal Congestion Mitigation Air Quality grant administered through the Metropolitan Council to fund a two-year demonstration of the U-Pass and MetroPass programs. Before the program began, the university had more than 7,000 bus riders. As a result of the U-Pass and MetroPass programs, transit ridership increased by over 25 percent during the 2000-2001 academic year. Current fall 2001 combined U-Pass and MetroPass sales total 13,035 meaning a transit ridership increase of over 85 percent. By investing a portion of the federal grant in new service, Metro Transit and the university will be able to provide new routes and added capacity on existing routes to accommodate the growth in ridership. The university is the state's third largest traffic generator; so the increase in bus ridership by university students, staff, and faculty eases traffic congestion throughout the metropolitan region.

The cost of U-Pass for university students will be $55 per semester, a saving of $161 and a 76 percent discount from the average pass price. is $50 per semester, providing a saving of 76 percent from the average bus pass price. U-Pass saved students over $6 million during its first year. The cost of MetroPass for university faculty and staff is $35 per month. Payroll deductions for MetroPass are taken pretax, so the actual cost is less than $25 a month, providing a saving of 54 percent.

The program drastically impacts the environment by reducing more than 50,000 vehicle miles traveled per day, saving more than 2,000 gallons of gasoline daily, and by eliminating over 220 tons of carbon monoxide and 4,500 tons of carbon dioxide emissions from the air annually.

In partnership with six institutions, the University of Minnesota seeks federal funding to offer U-Pass on a statewide level. Statewide U-Pass Initiative partners include Minneapolis Community and Technical College; Minnesota State University at Mankato; St. Cloud State University; the University of St. Thomas; University of Minnesota, Duluth (including Lake Superior College and St. Scholastica); University of Minnesota-Morris; and University of Minnesota-Twin Cities. Initiative partners are seeking a total of $8.9 million in federal funding to extend the multiple benefits of this program to students throughout the state.

The university administration is promoting Twin Cities Campus students living on campus and is planning new student housing projects to entice students to live on campus or in the campus community, rather than commuting. Student housing projects in Frontier and Middlebrook Halls will add a total of 330 dormitory beds for fall 2001. The university has budgeted over $50 million to

develop 2,500 more beds through university and cooperative public-private projects in the next few years. Riverbend Commons will provide another 424 dormitory beds and cooperative projects will add 924 beds in Stadium Village and 124 beds in Dinkytown for fall 2002. Two other cooperative projects under discussion for the East Bank will provide 1,100 beds in the near future. The shift of students from commuters to campus community residents will not only enhance the campus community but will drastically impact the environment by reducing more than 25,000 vehicle miles traveled per day, saving more than 1000 gallons of gasoline daily, and by eliminating over 110 tons of carbon monoxide and 2200 tons of carbon dioxide emissions from the air annually.

The University's Center for Transportation Studies (*http://www.cts.umn.edu/*) provides education, research and outreach services in the area of transportation. The primary goal of the Center for Transportation Studies is to initiate programs to address critical transportation issues. This process is guided by the participation of Minnesota leaders, transportation professionals, and university faculty and staff. This participation reflects the diversity of the various stakeholder groups affected by transportation. The center's mission is to:

- as part of a research and land grant university, actively create new knowledge and insight, and disseminate that knowledge and insight through teaching and service
- be a focal point for strengthening knowledge in transportation

The Center for Transportation Studies identifies critical issues in transportation, and uses multidisciplinary approaches to address them. The center's research, education, and outreach programs create an environment for faculty, students, and practitioners from multiple disciplines to collaborate in transportation research and education efforts. The center also provides leadership and outreach efforts to government officials, private sector representatives, and the public in the application of new knowledge and the implementation of policies, programs, and technology that improve transportation.

11. Education, Communications and Training

Department of Administration — The Resource Recovery Office represents the Department of Administration at Minnesota's Interagency Pollution Prevention Advisory Team meetings. Representatives from the divisions of Materials Management and Plant Management also regularly attend this meeting. The Resource Recovery Office provides Department of Administration support and representation on the Pollution, Reduction, Recycling Advisory Council of the OEA. The office also participates in the Department of Natural Resources' Youth in Natural Resources Program by providing mentoring and work experience to high school students.

The Resource Recovery Office provides information to state employees about waste reduction; toxicity reduction and recycling during the office clean-up events scheduled by Admin's Division of Plant Management. Used electronics are collected for reuse and recycling or managed as hazardous waste as appropriate. Staff, recycling equipment, and information are provided to facilitate and educate during the emptying of old paper files for recycling. In order to maximize paper recycling, Resource Recovery Office's State Recycling Center provides confidential paper destruction at no cost to public agencies.

The State Recycling Center strives to be a model of sustainability in the workplace by continuously addressing worker safety, ergonomics, decision-making, and purchasing to improve the environment:

- Sustainability in the workplace includes worker safety meetings twice a month; monthly reviews of employees' recycling efficiency and discussions of pending purchases, and participation in a teamwork/customer service workshop in October 2001.

- State Recycling Center employees implement continuous improvement and ergonomic design of operations and equipment.
- The use of 100 percent, post-consumer plastic lumber to construct safety equipment and three adjustable workstations was aided by a grant from the Minnesota Department of Labor and Industry. Employees promote the use of post-consumer plastic lumber during educational tours of the State Recycling Center.
- Employees arranged for installation of automatic overhead door controls to save heating energy.

The Resource Recovery Office routinely evaluates recycling systems, including recycling collection by customers, transportation, and facility operations.

- State agencies located on the Capitol Complex that used the State Recycling Center achieved a new recycling record by recycling 68 percent (by measured weight) of all their discards. A 60 percent recycling goal is set by Minnesota Statute § 115A.15, Subd. 9. No waste reduction credits are figured into this recycling rate.
- Seven full-time employees at the State Recycling Center managed 2,287 tons of recyclables in FY 2001. These recyclables were received from approximately 20,031 public employees, employed by 109 agency locations, within 56 buildings.
- Only 0.19 percent of the material received at the State Recycling Center was discarded as waste in FY 2001. Waste is required by contract to be sent to the resource recovery facility in Newport, Minnesota, in accordance with the Ramsey County solid waste management plan.

Resource Recovery Office's statewide recycling programs saved state agencies at least $114,822 in avoided solid waste disposal costs.

- In FY 2001, the State Recycling Center provided recycling services to 7 additional locations, including the new Retirement Systems of Minnesota Building that houses five agencies.
- Each month, Resource Recovery Office employees evaluate their progress to maximize the quantity and the quality of the recyclables marketed to industry from public offices.
- Resource Recovery Office employees rescheduled transportation routes serving 29 buildings to improve efficiency.

The Resource Recovery Office provides information to state employees about waste reduction (by toxicity and amount) and recycling opportunities at annual events such as the Recycling Association of Minnesota-National Solid Waste Management Association Fall Conference, Central Stores Product Show, the Accounting and Procurement "Spring Fling" and the Communications.Media Open House. For A.R.D, the Resource Recovery Office printed out and distributed 200 "info to knows" that were placed in common display areas of Capitol Complex Buildings. A custom display was created and display in the lobby area of the Ford Building from November 13 to 16.

The office prepares environmental purchasing information, tabletop displays, "Info-to-Know" wall postings, and on-site presentations in response to agency requests. The Resource Recovery Office also provides conference displays and handouts at various public events, including the those sponsored by the Recycling Association of Minnesota, Solid Waste Association of North America, the Minnesota Pollution Control Agency, and the Minnesota Office of Environmental Assistance.

The Plant Management Division coordinates departmental pollution prevention information through the Resource Recovery Office. Communications.Media informed customers of environmentally preferred alternatives to reduce pollution through its *Fast Facts* newsletter, the Annual Paper Fair and Design event, training classes, and its Internet web site: http://www.comm.media.state.mn.us.

Communications.Media, the Materials Management Division, and the Resource Recovery Office support Minnesota Statutes Section 16B.122 by providing state agencies with guidelines for the use of recycled papers and environmentally preferred inks.

During fiscal year 2000, the Materials Management Division, as a part of its Authority for Local Purchasing Training and ALP Management Overview programs, has trained approximately 540 state agency staff in pollution prevention and procurement of environmentally responsible products and services. Materials Management Division worked with the OEA to provide additional environmentally responsible information through the purchasing training provided to state employees. The Materials Management Division has updated the environmentally responsible purchasing section of the Authority of Local Purchasing training manual that is provided to state employees.

MMD's Acquisition Management Specialists build environmental considerations into bids and contracts whenever possible. They have a variety of ways to accomplish this, such as solicitation requirements, environmental preferences, or Best Value bids. The Materials Management Division maintains a list of state contracts that contain environmentally preferable products. The list is available on the MMD web site: www.mmd.admin.state.mn.us/evir.htm#h.

The Materials Management Division has established an advisory committee called the Environmentally Responsible Work Group that meets monthly. This group works to promote environmental purchasing in state government and includes representatives from the state government as well as interested nonprofit organizations. The current members are Resource Recovery Office, Office of Environmental Assistance, the Recycling Association of Minnesota, the Pollution Control Agency, the Department of Transportation, the Department of Natural Resources, the Housing Finance Agency, the Department of Labor and Industry, the Department of Economic Security, and the Veterans Home Board.

In 2000, the group collaborated to revise the Department of Administration's environmental web page and assisted in improving environmental printing specifications and guidelines. In 2001, the group is providing hands-on assistance to agencies to increase the purchase of recycled copy paper. The Materials Management Division and Resource Recovery Office contributed to the development of the *Environmental Preferable Purchasing Guide.* The guide was distributed to all certified purchasers and to cities and counties. The Resource Recovery Office promoted this guide on displays and during presentations. The Materials Management Division, in conjunction with the InterTechnologies Group Telecommunications Division, has established a contract for Lucent equipment that offers both new and refurbished telecommunications equipment. Agencies can choose to purchase reused equipment.

Department of Commerce — The department operates the Energy Information Center, which serves energy consumers and features a toll-free hotline staffed full-time by Energy Information Specialists. The Center answers questions, provides advice, and mails publications on energy conservation and renewable energy technologies, which are printed with soy-based inks on recycled paper. The Energy Information Center responded to 60,000 telephone, mail, and trade show inquiries; and distributed over 31,000 CD-ROMs and over 240,000 printed publications during fiscal 2000. Most of the brochures are available in electronic format and have been placed on a single CD-ROM, which reduces printing and mailing costs by an average of $0.55 per mailing.

The Minnesota Energy Code interpretation and enforcement duties were transferred by statute to the Department of Administration's Building Codes Division in fiscal year 2001. The department will continue to support the development and promotion of the energy code, but as an advocate rather than from a regulatory standpoint.

The department has formed a small committee to actively look into reducing the materials and energy used in its day-to-day activities. A list of target activities will be prioritized and addressed over the

coming year. The first step with each activity will be to establish a baseline of data before any action is taken. Cubicle electricity use will be one of the first targeted areas (see section 12 *Electronics*).

Department of Corrections

Most facilities — E-mails, whether individual or all-staff, are often used for messages of general note. E-mails saves paper, mail room time, and telephone tag time, and provides the ability for almost immediate response.

MCF-OPH — Videoconferencing is becoming a preferred means for convening statewide meetings, such as safety, policy and procedure drafting, etc. Each videoconference saves time and travel expenses on the part of safety officers and/or upper management and security personnel.

Staff training programs and in-service classes at OPH and STW have been combined to offer one class for two or more facilities which saves travel time, scheduling, and overtime costs for participants and more efficiently utilizes instructor time.

MCF-RC — Maintenance staff are trained on chemical use. The facility has set up a recycling program for all staff.

MCF-SCL — All the vocational teachers, safety officers, and plant operations management receive pollution prevention education through annual continuing education at a cost of $1,000 annually. The facility remains current with new and existing legislation by doing this and plans to continue education efforts.

MCF-SHK — The facility uses e-mail. All offenders are trained during reception and orientation on the rule about keeping windows closed.

Office of Environmental Assistance — Many programs within OEA fall under this category. The OEA continues to use voluntary partnerships as a means to prevent waste. A coordinated effort with the Minnesota Association of Metal Finishers and EPA to implement cost-effective pollution prevention in plating facilities is one recent example. Ongoing efforts with the Minnesota Chamber of Commerce Waste Wise program to help businesses recycle and reduce waste is another example.

OEA staff continues to work with representatives from Minnesota's healthcare community to promote P2 within the healthcare sector. The Healthcare Environmental Management Awareness and Resource Reduction Team (HEARRT) meets quarterly. OEA and MnTAP staff organized training programs for hospital staff in three Minnesota hospitals to address the goals of the Hospitals for a Healthy Environment (H2E) project. That project has the goal of eliminating mercury in healthcare facilities by 2005 and reducing overall waste by 33 percent by 2005 and 50 percent by 2010. The training staff hope to reach hospitals and clinics throughout Minnesota. After three years of work, the H2E effort has produced three key resource documents to eliminate waste from healthcare settings: *Mercury Waste Elimination Plan, Chemical Waste Minimization Plan,* and *Total Waste Elimination Plan.*

OEA staff coordinates the Interagency Pollution Prevention Advisory Team, developing agendas and facilitating quarterly meetings, recording minutes, and maintaining the mailing list. In fiscal year 2000, IPPAT continued to implement Governor Jesse Ventura's governor's executive order for pollution prevention, which includes pollution prevention, waste reduction, and energy and resource conservation. Agencies that regulate activities which generate significant quantities of hazardous waste or use significant quantities of resources and/or toxic chemicals, or whose policies have important effects upon such activities, are required to develop policy statements indicating that pollution prevention is a priority. These agencies are further required to integrate pollution prevention into their regulatory and policy activities as a primary means of meeting standards.

IPPAT meetings discuss promotion of sustainability, growing smart in Minnesota, the Metropolitan Council Environmental Services mercury reduction strategy, environmental purchasing, rechargeable battery recycling, environmental purchasing and recycled latex paint, etc.

The ongoing MN GREAT! award program, first organized in 1995, is part of the Governor's Awards program. MnGREAT! recognizes environmental achievements by government employees. The program focuses on conserving resources, preventing pollution, and reducing waste at the source. The winners of the 2001 MnGREAT! Awards are:

- **Dave Pehoski Distinguished Service Award.** The Interagency Pollution Prevention Advisory Team presented Dave Pehoski a MnGREAT! award for his steadfast support of IPPAT since joining in 1992. Dave has been a consistent and active representative to IPPAT from MnDOT. On behalf of MnDOT, Dave enthusiastically shared many technical solutions to hazardous waste, recycling, and pollution prevention problems with IPPAT members. He has been an integral part of MnDOT teams that have achieved successes in pollution prevention, resulting in the consolidation of around 130 statewide district hazardous waste generators into 10 or 20 very small quantity generators. He also encouraged all state agencies to use the environmental auditing system the Department of Transportation developed along with the Department of Administration. Dave displays the highest professional standards in his work, and IPPAT members appreciate his teamwork and strong commitment to governmental pollution prevention. He has served on various IPPAT work groups including crafting the Governor's Executive Order on Pollution Prevention to state agencies and serving on the MnGREAT awards committee. It is quite fitting that he now be a recipient of a MnGREAT award.
- **The Minnesota Pollution Control Agency Region I and Western Lake Superior Sanitary District** in Duluth for the Mercury-Free Zone project, an outreach and education program to eliminate mercury from the schools in the region. Staff at the Pollution Control Agency Region I and the Western Lake Superior Sanitary District sent over 100 letters to schools throughout the seven-county region of northeast Minnesota, inviting them to pledge to become mercury free by 2003. Over 40 schools had pledged and over 130 pounds of elemental mercury and mercury-contaminated equipment had been eliminated from the schools by May of 2001. They anticipate many more schools to join and much more mercury to be eliminated in the fall.
- **The Minnesota Pollution Control Agency, St. Paul,** for the Pollution Prevention in Building Demolitions outreach and education program. Recognizing the numerous environmental issues encountered during building demolition projects, Pollution Control Agency staff established a partnership with local governments, building owners, and demolition contractors to provide training through conferences, fact sheets, and technical guidance. They train owners and demolition contractors to recognize hazardous waste and remove it prior to building demolition, resulting in significant reductions in hazardous materials going to unlined demolition landfills.
- **The University of Minnesota Extension-Hennepin County, and Health CareWithout Harm**, for the Mercury Thermometers and Family Health in Minnesota project. The project provided outreach and education to communities in Minnesota, especially the Hmong and Hispanic communities, about health threats from mercury in the environment. Project partners distributed "Mercury Thermometers and Your Family's Health" brochures to health care providers, childbirth educators, childcare centers, midwives and others statewide and conducted thermometer exchanges in Hennepin County, replacing over 1,100 mercury thermometers with mercury-free thermometers.
- **The Minnehaha Creek Watershed District and Minneapolis Park and Recreation Board** for the Chain of Lakes Clean Water Partnership, an urban lake restoration program. This six-year, $8.1 million program was a team effort headed by the Minnehaha Creek Watershed District, in partnership with the City of Minneapolis, the City of St. Louis Park, the Minneapolis Park and

Recreation Board, and Hennepin County. Project partners combined environmental engineering strategies and community involvement, which has significantly improved water quality in the Minneapolis Chain of Lakes.

OEA's Minnesota Sustainable Communities Network (MnSCN), which was started in January 1997, continues to grow and currently has 2,100 members in 2001. OEA staff facilitates networking, information exchange, and better access to assistance among MnSCN members—individuals and organizations with an interest in sustainability issues. One important component of sustainability is pollution prevention.

Currently, 1,835 MnSCN members receive a biweekly e-mail update on sustainability and are increasingly listing themselves in a member directory on the MnSCN web site at www.nextstep.state.mn.us. This NextStep web site has a searchable database of over 600 resources. In October 2001, MnSCN sponsored a conference called *Celebrating Successes,* which was held at the Minneapolis Convention Center, attracting 600 participants.

The OEA distributes a number of waste reduction and pollution prevention materials through its Education Clearinghouse, including Source Reduction Now, a detailed guide to implementing source reduction programs in companies and agencies, junk mail campaign and waste reduction campaign materials and *A GreenPrint for Minnesota: State Plan for Environmental Education.* Other OEA outreach efforts also included:

- The OEA and MMD trained over 700 state purchasers on environmental purchasing via the Department of Administration's ALP recertification class. The OEA also helped develop and distribute the Environmentally Preferable Purchasing (EPP) Guide to nearly 1,000 state purchasers.
- The OEA attended nearly a dozen other procurement workshops/conferences throughout the year to promote "green" purchasing at the state and local level.
- The OEA has participated in Green Seal's Stakeholder Work Group to develop an environmental standard for industrial and institutional cleaners.
- The OEA served as a technical advisory member for San Francisco's Environmentally Preferable Purchasing Program.
- The OEA has facilitated the Midwestern Working Group on Carpet Recycling in developing a national purchasing specification for recycled carpet.
- The OEA and the Department of Administration were invited to a summit meeting co-sponsored by the White House Task Force on Recycling and the Environmental Protection Agency to explore strategies for accelerating "green" purchasing across the country.

The OEA provides training for the *Design for the Environment (DfE) Toolkit,* developed to help Minnesota manufacturers integrate environmental attributes into products before they are produced. DfE considers the environmental impact for the entire life cycle of a product's life, including pre-manufacture, manufacture, distribution, use, and end-of-life. Once a product is designed, its environmental attributes are largely fixed; the *DfE Toolkit* allows manufacturers to address environmental impacts at the most fundamental level—product design.

Metropolitan Airports Commission — MAC employees are trained annually on spill prevention, control and countermeasures (SPCC) and storm water pollution prevention (SWPP) techniques. DOT training is completed every three years. Also, a pollution prevention team monitors the outfalls and detention ponds around the airport. These employees have continuous input on how to improve the site and/or operations from the point of view of hands-on experience.

There is also annual hazardous material training where basic pollution prevention methods are addressed. Recently a comprehensive recycling program was unveiled detailing how and where MAC employees can recycle a wide variety of items. A recycling guide was distributed to all employees and is included with new employee orientation materials. A Recycling and Waste Reduction Team meets regularly to examine and implement waste reduction opportunities.

Metropolitan Council – Environmental Services — Within the MCES is the Industrial Waste and Pollution Prevention (IWPP) Section. This unit, along with the former office of Customer Relations and Environmental Education, has provided technical and financial assistance toward the production and distribution of the *Roots of Hazard*, an original interactive CD-ROM designed for use by fifth and sixth grade school age children. *Roots* teaches students how to reduce hazardous household products at the source and how to properly dispose of any that remains as hazardous waste. This CD was produced by the Minnesota Office of Environmental Assistance (OEA).

In 1999, a new conservation brochure, "Reducing Water Usage in Your Home," was prepared by the MCES and also included in Minneapolis water utility bills. These continue to be distributed at educational gatherings.

The MCES has been a key member in the WaterShed Partners, a working association of 44 organizations from various levels of government, schools, and nonprofit groups. This past year, the Think Clean Water campaign placed advertisements in newspapers and public service announcements on the radio to enlist the public's participation in practices that would prevent non-point water pollution. The comprehensive *Resource Education Guide* was distributed to all metro area cities and counties in the state. Two traveling interactive, museum-quality exhibits were produced and appeared throughout the state. WaterShed Partners and the campaign were recognized in 1999 with a MN GREAT! award, a Governor's Award for Excellence in Pollution Prevention, *and* with the prestigious Environmental Initiative Award for "the collaboration to reach truly unique and forward-thinking environmental solutions."

MCES employees volunteer to staff displays and interactive exhibits at events such as the Earth Fest, Earth Day at the Minnesota Zoo, the State Fair, the Children's Water Festival, and Farmington Pollution Prevention Days. Exhibits are also available to be loaned out and educational materials are available for distribution.

Since 1995, MCES continues to distribute the *Non-Point Source Pollution Prevention Environmental Resource Guides* at teacher workshops. These sessions were initially funded through the Twin Cities Water Quality Initiative grant program and are on-going under the MetroEnvironment Partnership grant program. Four teacher workshops were presented in 2000, and each workshop was completely filled.

Waters to the Sea is a CD-ROM that was produced with council funding by Hamline University's Center for Global Environmental Education. A copy of this project was given to every public school (over 580 schools) in the Twin Cities in 2001 and more than 3,000 copies have been distributed. Fun multimedia activities connect environmental history, hydrology, ecology, and water quality.

The IWPP works in an advisory/technical role as well as a regulatory role with its permitted industrial users. Three additional issues of the Open Channel News have been mailed to industrial users in 2000. A specific P2 web sites has been prepared for the Internet. An outreach is made to non-industrial users such as dental and medical clinics, furniture strippers, and radiator shops. IWPP staff attended both the Great Lakes Regional P2 Roundtable and National P2 Roundtable conferences this past year.

Specific to the concerns over mercury in the wastewater collection and treatment system, the IWPP prepared a Mercury Fact Sheet and co-authored a monograph on dental waste management for the

Water Environment Federation. It also conducted a workshop for hospital and county hazardous waste officials on the topic of “Minimizing Mercury in Healthcare Facilities.”

In 2001, an instructional videotape on mercury and hazardous waste management was distributed to area hospitals which also served to identify mercury sources, alternatives, and spill cleanup. Also, the IWPP hosted an open house to display sampling and amalgam removal equipment as part of its P2 study and assistance outreach to dental clinics.

Metropolitan Mosquito Control District — Annually the district conducts training sessions for all district employees in conjunction with the Minnesota Department of Agriculture. A portion of these training sessions is used to review waste management and recycling procedures employed by the district. This training includes an overview of regulatory requirements, examples of waste streams produced by the district, handling and disposal procedures, storage requirements, recycling, and emergency spill response plans. Emphasis is placed on reducing the use of hazardous materials, replacing materials with less hazardous counterparts, and recycling.

Additionally MMCD employees must go through training sessions that focus on the proper use, transport, and handling of all the pesticides used by MMCD. Employees who use pesticides for the control of adult mosquitoes must attend training sessions given by the MDA, they must take and pass a written exam and be licensed by MDA in order to use these control materials.

Pollution Control Agency — MPCA has pollution prevention information available to all staff and external customers on their web sites. This information is easy to access and includes many suggestions and training tools for the staff to utilize for waste minimization at work and at home on a daily basis.

Minnesota State Colleges and Universities

Bemidji State University — The University participated in the state’s 2000 Pollution Prevention Week activities by posting pollution prevention messages and information on the faculty/staff computer e-mail list. Articles on pollution prevention awareness and activities were also published in the campus newspaper during the school year. The Students for the Environment, a campus student organization, worked with the campus food service provider and Residential Life to heighten awareness on food waste and promote food waste reduction.

Bemidji State University continues to require environmental courses for satisfactory completion of the Liberal Arts core. "Focus on the Environment" is one of seven areas in the University's Liberal Education Program. Students pursuing a bachelor's degree must take a minimum of one, three credit course, from this area.

North Hennepin Community College — Bright colored signs and containers are prevalent in buildings and throughout campus grounds. Plant services staff are aware of the importance of the college’s recycling effort, and new hires are trained on proper procedure before allowed to work independently.

St. Cloud State University (SCSU) — The Environmental and Technological Studies Department of SCSU reflects increased opportunities for pollution prevention emphasis in the region of laboratory procedures. An internship program has expanded.

Department of Transportation — Mn/DOT conducts three meetings annually with district/division personnel who have taken on the additional part-time task of waste management coordinators. Mn/DOT continually conducts training within the department and occasionally to counties, cities, and the private sector.

University of Minnesota — One of the most important activities in developing a sustainable world is education of the current and future generations on the importance of pollution prevention, resource conservation, and sustainability. The University of Minnesota offers over 500 environmental courses from 54 different departments, many of which deal directly with pollution prevention. One interdisciplinary course called *Preventing Pollution: Innovative Approaches to Environmental Management,* focuses on pollution prevention. This course is offered jointly through the departments of Civil Engineering, Honors Seminar, Management, Public Affairs, and Public Health.

In 1999, a small group of faculty, staff, and students started the Sustainable Campus Initiative Committee (http://www.cnr.umn.edu/sci), an ad hoc committee with a mission to use the campus and its physical facilities as a tool for environmental learning. The committee is currently working on two pilot projects that will continue through 2001-2002: the Sarita wetland restoration (http://www.nwf.org/campusecology/newsletter/watershed.html) and an ecological footprint of the University of Minnesota, Twin Cities campus (see http://www.nwf.org/campusecology/index.html and http://www.bio.psu.edu/Greendestiny/indicators.shtml). The wetland restoration began with a cleanup during Beautiful U Day in September 2000. Implementation of the restoration began in the spring of 2001 and will continue through the next few years. On September 25, 2001, students, faculty, staff and community volunteers will build the first rain garden on the university campus as a part of Beautiful U Day 2001. The rain garden will reduce the storm water and runoff pollution that flows to the Sarita wetland and eventually to the Mississippi River. The rain garden project developed out of a student research paper done for a water quality class.

Through continued student involvement and hands-on projects the committee hopes to engage students as active citizens of the university. At the same time, the committee will increase teaching opportunities and achieve a more environmentally sustainable campus.

The university's College of Architecture and Landscape Architecture (CALA) is working to cultivate the interest of future architects in studying and building environmentally friendly design and construction. "Greening CALA" is a project developed by a combination of faculty, staff and students to incorporate these ideas and keep communication active among campus groups working toward a similar goal-sustainable development. CALA has implemented some of its ideas of sustainable design into the renovation of the architecture building. The new building is an opportunity to show that humans can inhabit it in a more sustainable way. The goal is to be able to use the building as a living lab to find out which methods of sustainability work the most efficiently. Students will be able to see photovoltaics, a floatable solar collection device, in the remodeled building. A kiosk will be set up for students to see the exact amount of energy produced at any time. Along with physical changes to the school, Greening CALA has also brought new courses to the curriculum. Undergraduate and graduate students can both take classes dedicated to building and designing in an environmentally friendly manner. While no sustainable development design major is offered in the college yet, CALA is working toward that goal.

Pending a grant from the Office of the Executive President and Provost, CALA will develop a web site with clickable images of university buildings to find environmental information This will help connect people across campus working toward the same goal. Part of the plan is to start a course titled "Green Mapping: Tracking Sustainable Development at the U" for spring semester to help students get involved with sustainable development and identify green efforts on campus.

The department of Environmental Health and Safety conducts annual training in hazardous waste management. The training covers the basics of pollution prevention. Approximately 2,500 employees are trained annually. The training is offered through classroom presentations and over the Web. The web-based training program is available on the Environmental Health and Safety home page (www.dehs.umn.edu/training/hwd/generator).

The Waste Abatement Committee made up of members from many key departments, coordinates and monitor pollution prevention projects at the University of Minnesota. The committee communicates information to new employees through orientation programs and to existing employees through in-house vendor trade shows sponsored by the Purchasing Department. The committee is working toward a P2/resource conservation web page that will promote and provide instruction and information about self-audits and other P2/resource conservation techniques. The university's *2000 Pollution Prevention Report* is posted on the Web at http://www.dehs.umn.edu/hwd/pollutionrpt.html.

The Minnesota Technical Assistance Program (MnTAP), located in the Department of Environmental and Occupational Health, in the School of Public Health at the University of Minnesota, continues to provide technical assistance in the areas of industrial and solid waste management and pollution prevention to Minnesota's manufacturing and service industries (www.mntap.umn.edu). MnTAP provides technical assistance to Minnesota businesses through the following services: telephone assistance, site visits, intern programs, presentations and workshops, technical publications, library, and materials exchange. MnTAP averages 150 calls per month and 140 site visits a year.

The University of Minnesota's Center for Continuing Education *(http://www.cnr.umn.edu/CCE)* was created to be a world-class continuing education program, a resource network that will bring current research, new technologies, and state-of-the-art practices to resource professionals-educating professionals to face tomorrow's resource challenges. The center, originally named the Institute for Sustainable Natural Resources, grew out of the Sustainable Forest Resources Act of 1995, which developed principles for the sustainable management, use, and protection of Minnesota's forest resources. The act recognizes continuing education as one important component of this mission. The university's College of Natural Resources provided the matching funds to create the center.

The center provides continuing education opportunities including skill building and special topic information for foresters and other resource professionals, as well as forest-related education opportunities pertaining to fisheries biology, wildlife biology, park resource management, and other fields. The center emphasizes an integrated, systems approach—designing educational programs based on the understanding that natural resource management is part of an interdependent system. Social, economic, and ecological values must work together to sustain healthy, productive ecosystems. By focusing on emerging issues, the center will bring current research, new technologies, and state-of-the-art practices to natural resource professionals.

The University of Minnesota Extension Service (www.extension.umn.edu/) is the major educational outreach arm of the University of Minnesota, with offices in every county of the state. Campus-based extension specialists work with county-based extension educators to deliver educational programs through meetings, demonstrations, workshops, publications, and electronic delivery methods such as interactive TV, satellite teleconferences, and computer networks. Programs range from water quality to sustainable agriculture, from urban horticulture to youth development, from natural resource management to tourism development. Environment and Natural Resources educators and specialists develop and implement a broad range of programs with information on shoreland issues, agricultural systems and residential, forestry/wood products, and on all aspects of environment and natural resource management, such as water quality; forestry and wood products; solid waste and wastewater management; and indoor environmental issues such as air quality, radon, and housing materials.

The Institute for Social, Economic and Ecological Sustainability (ISEES; www.fw.umn.edu/ISEES/) was initiated in July 1996 to strengthen the University of Minnesota's capacity to analyze sustainability issues and recommend options for moving toward sustainability. ISEES's vision is based on the fundamental idea that sustainable relationships among the social, economic, and ecological spheres of the world are possible and desirable. ISEES brings together people from the natural and social sciences

and practitioners to analyze sustainability issues and recommend options for moving toward sustainability. The institute believes that the development of options for sustainability requires integrating social, economic, and ecological factors. ISEES supports transdisciplinary research and education on sustainable environments ranging from the urban community and watershed to the regional and global scale. In the seminars, workshops, and annual publication competition, the institute bridges divisions between the natural and social sciences and between scholars and practitioners. Contemporary research questions and societal debates about sustainability revolve around a number of rich and interconnected themes. To address these themes, the research, education, and outreach goals of ISEES strive to:

- generate a new transdisciplinary synthesis of concepts and methods for research on sustainability issues
- understand forces influencing sustainability at local, regional, and global scales
- develop and evaluate techniques for assessing conditions for sustainability
- generate policy options for moving communities toward sustainable conditions
- facilitate information exchange among scholars, practitioners, and citizens

ISEES is offers an interdisciplinary course, "Population, Environment and Sustainability," for all seniors and graduate students who are interested in human population and its relationship to environmental change and sustainability. The beginning of the new millennium is a critical moment for understanding the complex relationship among human population processes, environmental change, and ecological and human sustainability, and for developing appropriate policy measures. Because knowledge about the relationship between population and sustainability is fragmented among many specialized disciplines, each with its own piece of the puzzle and its particular conceptualization of the issues, public debates and policies often work at cross purposes or are counter-productive.

ISEES addresses this problem by bringing together students and faculty from the social sciences and natural sciences to exchange information, critically evaluate the varied perspectives, and to communicate a more unified understanding of population growth, environmental change, and sustainability (http://www.fw.umn.edu/ISEES/courses/popsyllabus.htm).

The University will host the 2001 Midwest Green Campus Workshop on November 3, 2001 (http://www.cnr.umn.edu/sci/2001WorkshopIntro.html). The workshop has been organized and run by the Sustainable Campus Initiative at the university.

The University of Minnesota Twin Cities Student Unions Programs and Activities Board, in cooperation with ISEES and others, will host the Passport to Earth Summit 2002: Exploring Sustainable Development forum series throughout the 2001-2002 academic year (http://www.coffman.umn.edu/earth/links.php). Twenty years after the first Earth Summit, scientists have made limited progress in evaluating and mitigating the environmental costs to growth and development. We will use the Rio+10 Earth Summit, slated to occur in summer of 2002, as the topical focus of the series. The mission of the Passport Series is simple: to increase awareness of, participation in, and education at the University of Minnesota about the primary international effort to protect the environment through sustainable growth and development practices. Our goals for Passport to Earth Summit 2002 series are to:

- communicate the history, current status of, and controversies about the implementation of Sustainable Development Strategies based on international agreements regarding environment and development made in the past ten years (Agenda 21-Rio Earth Summit's blueprint for sustainable development).
- strike balance and show diversity in the representation of perspectives addressed within each theme.

- touch on local, national and international scales of policy and activity in each event.
- encourage presenters to explicitly provide their definition of sustainable development.
- design events to incorporate or culminate an action item, which may be in the form of a final resolution mutually agreed upon by panelists.

12. Electronics

Department of Administration — The Resource Recovery Office and the Division of Plant Management coordinate "office clean up" days for agencies in order to facilitate timely reuse, recycling, and proper management electronic appliances.

The Materials Management Division contracts provide Energy Star compliant computers and copiers. In the new Information Technology hardware contracts, the department requires all energy efficient equipment be identified. The Materials Management Division provides for the reuse of computers and other electronics through its Surplus Services program.

Computers are provided to Minnesota K-12 schools in collaboration with the departments of Corrections, and Children, Families and Learning. The program accepts personal computers no longer needed by state agencies and private businesses and through the use of prison inmate labor, refurbishes and distributes them throughout K-12 schools. Surplus computers are also distributed to township government offices, a program which earned a 1997 Partnership Minnesota Cooperative Public Award for outstanding achievement.

The Materials Management Division in conjunction with other agencies and Cooperative Purchasing Venture members is working on establishing a statewide computer/electronics recycling disposal contract. The Materials Management Division awarded the Information Technology contracts for leases, rentals, and management of computer equipment. This will reduce the amount of surplus and used equipment that requires hazardous waste management.

Department of Commerce — Computer equipment is either surplused or disposed of according to state guidelines. A March 13, 2001 survey estimates that about 120 computer monitors are left on overnight. In July 2001, when energy conservation alerts were issued by Xcel Energy, an e-mail message was sent out to all employees asking them to conserve electricity in their cubicles during the day and after they went home.

Department of Corrections

MCF-OPH — Electronic toilets and showers are used where applicable for the dual purpose of saving energy through regulation of water and reduction in offender vandalism. OPH plans to change all offender showers, toilets, and sinks to water conservation devices. This will eliminate abuse as well as save potentially 52 percent of current water usage in the future. E-mail is used extensively within the facility for Human Resource messages, memos of general interest, daily reports, etc.

MCF-RC — Electronic toilets, showers, and sinks are used where applicable for the dual purpose of saving energy through regulation of water and reducing inmate vandalism.

MCF-SCL — The facility recycles electronic devices TVs, fluorescent bulbs/lights, computers, and monitors at a cost of $1,000 to $2,000 annually. SCL complies with legislation and reduces landfill cost with this activity.

Office of Environmental Assistance — The OEA continues its leadership in state and federal environmental policy initiatives in the computers and electronics manufacturing sector. These efforts include Design for Environment (DfE), market development, and end-of-life management strategies for computers and other electronic appliances. Ongoing efforts include:

- **National Electronics Product Stewardship Initiative (NEPSI):** In early 2001, the OEA began working with other states and the electronics industry to establish the national initiative. Minnesota's product stewardship policy and partnerships with electronics manufacturers and retailers over the last three years helped lay the groundwork for this national dialogue.

  Minnesota is one of ten states participating in NEPSI. Other stakeholders include representatives from local government and the U.S. EPA, 12 electronics manufacturers, several major electronics retailers and recyclers, and national environmental organizations.

  The goal of this series of meetings between government, the electronics industry, and environmental groups is an agreement by September 2002 on how to establish and fund a national program for the recovery, reuse and recycling of used electronics. Participants expect this agreement to include an implementation plan and schedule. Market development efforts for materials found in waste electronics, such as highly engineered plastics and leaded glass.

- **State contract ensuring proper management of used electronics** discarded by government agencies and public entities. In early 2002, the Department of Administration worked with the OEA, Hennepin County, the Pollution Control Agency, and the University of Minnesota to include a provision in the state contract specifying that no component materials from used electronics are exported overseas for management.

Metropolitan Airports Commission — MAC purchases computer equipment that is Energy Star compliant. Obsolete electronic equipment is recycled by an approved vendor.

Metropolitan Mosquito Control District — The district specifies Energy Star compliant computers and monitors in purchase agreements for computer equipment. MMCD encourages employees to use the automatic power down feature on desktop PCs that reduces the power consumption after a specified amount of inactivity. As MMCD replaces older computers with new units, it will investigate the possibility of specifying LCD monitors as standard equipment. The LCD monitors contain far less hazardous materials than the tube type monitors used today. Obsolete but still usable computer equipment is offered to the general public at public auctions in the metropolitan area. Computers, monitors, and peripheral equipment that are no longer serviceable to MMCD are recycled through state and county contracts.

Pollution Control Agency — All working 486 computers and low-end pentiums, monitors, keyboards, and mice are being delivered to the Computers for Schools program where the local correctional facilities refurbish them and then they are delivered to area schools for student use. MPCA makes extra efforts to provide information electronically for internal and external customers to save paper, including putting some annual reports on the MPCA web page.

Minnesota State Colleges and Universities

North Hennepin Community College — All discarded electronics are properly disposed of by a licensed local contractor. The college has started leasing much of the electronics that was once bought, used, and then discarded in the past. Leasing electronic equipment reduces NHCC's waste stream quantities of this type of material, as the leased equipment is returned to the distributor once the lease is up.

St. Cloud State University (SCSU) — The SCSU business office provides for the reuse of some

computers, electronic equipment and other property through the surplus property resale program. Other electronic equipment (eight shipments totaling about 40,000 pounds and net cost of $3,766.89) was recycled for somewhat offsetting commodity and precious metal credits. Styrofoam from computer, electronic and other shipping cartons was recycled.

Department of Transportation — Mn/DOT Mn/DOT's road weather information system consists of 93 sites throughout the state that collect data from atmospheric and pavement sensors and transmit this information to servers in St. Paul, which use the Internet to deliver information to Mn/DOT staff. The system monitors winter road conditions to aid in more efficient use of chemicals and equipment.

An extensive evaluation of the highways traffic management system has occurred in the 1970s and 1980s. Several programs were implemented as a result from these studies; the most noticeable to the traveling public are metered ramps. Mn/DOT currently conducts a traffic management and development program. This program includes evaluation of high occupancy vehicles (HOV) lanes and programs, incident management research, new product evaluation, traveler information research, simulation and modeling and traffic management studies.

University of Minnesota — The University of Minnesota statewide system collects all electronic equipment, redistributes what it can within the university, and then pays to have the rest sent to a licensed demanufacturer. The demanufacturer markets a portion of the equipment (sells the equipment as is or as components), recycles a portion (particularly scrap and precious metals), and properly disposes of the remainder. The university recycles approximately 200,000 pounds of electronic material annually. The university has worked extensively with the Minnesota Department of Administration and other agencies to develop a statewide computer/electronics recycling contract.

The University's Computer Repair Service (CRS) and Como Recycling Facility (CRF) both provide collection of unwanted computer systems. Both programs market the usable computers back to the university community, employing web pages and showrooms (CRS for a charge and CRF for free). CRF also manages a web-based exchange program (http://www1.umn.edu/recycle/reuse.html), referred to as the Virtual Warehouse, that allows interested parties to market or buy computers and other electronic equipment online without the middlemen.

The university offers electronics recycling service to educational institutions throughout the state via its Chemical Safety Day Program (http://www.dehs.umn.edu/csdp). The Chemical Safety Day Program, which has operated since 1981, was already providing fluorescent lamp recycling in addition to chemical waste management services to Minnesota schools.

The university's annual Beautiful U Day 2000 (http://www.facm.umn.edu/bud/BUDay.htm) featured an electronic waste collection that served to both facilitate the proper management of electronic waste and to educate the university community about end-of-life electronics management and regulations. DEHS used a newsletter article (ftp://www.dehs.umn.edu/newsletter/fall00.pdf), web site information (http://www.dehs.umn.edu/whatshot/beautifulu.html), a brochure (ftp://www.dehs.umn.edu/whatshot/BUDay.pdf), and listserve e-mails to promote and educate for this event. Seven drop-off sites on the Twin Cities campus accepted end-of-life electronics and distributed information to the university community. Twenty-six tons of electronics were collected and sent for recycling. It usually costs to recycle electronic equipment. A typical personal computer and monitor contains 6 pounds of lead and various other environmentally hazardous constituents that can be reclaimed and reused. Proper management of the electronics protects the university from future environmental liability and provides resource conservation and avoids heavy metal contamination of soil, surface waters, and groundwater.

13. Energy - Lighting

Department of Administration — The Division of State Building Construction participates with utility companies to retrofit existing building lighting systems to achieve energy consumption reduction. The division also specifies automatic turn-off switches for all overhead lighting in its remodeled offices.

The Plant Management Division recycles incandescent bulbs to prevent solid waste disposal; and coordinates building lighting retrofits with the Division of State Building Construction and Northern States Power Company to reduce energy consumption, thereby decreasing pollution levels.

The Materials Management Division procures only reduced or no-mercury fluorescent lamps. Mercury content in fluorescent lamps has been either eliminated or reduced to negligible levels due to EPA mandates in the late 1980s and early 1990s, per Minnesota Statutes Section 115A.965, Subdivision 2. The Materials Management Division in conjunction with the Pollution Control Agency, Department of Transportation, and the University of Minnesota has a statewide contract for recycling fluorescent lamps and HID (high intensity discharge) lamps and light ballasts that contain PCBs (polychlorinated biphenols). The Materials Management Division purchased solar-powered highway warning signs for the Department of Transportation. The Travel Management Division minimizes lighting through the use of energy efficient lights.

Department of Commerce — See section 11 *Education, Communications and Training.*

Department of Corrections

MCF-OPH — New clear lenses have been installed in inmate rooms to increase foot-candles to meet ACA requirements without the need to increase bulb wattage. The lower wattage bulbs were already in use, having been installed as part of an NSP energy conservation program in the 1990s. Lamps are replaced on a regular basis as part of a preventive maintenance program, thereby saving time and effort changing out individual lamps in many locations. Fluorescent bulbs are recycled through Recyclites.

MCF-RC — RC uses electronic ballasts and has programmed lighting on a timer for shut off times.

MCF-SCL — The facility lighting system was replaced in 1993 via an NSP conservation lighting retrofit program at a cost of $252,000. This energy conservation measure has a long-term cost saving of about $2,000/month. The payback is seven years. SCL plans to replace T-8 lights; and the switch to electronic fixtures and ballasts is ongoing.

MCF-SHK — SHK recycles fluorescent lamps through the state contract and is converting to electronic ballasts on fluorescent fixtures.

Office of Environmental Assistance — The OEA encourages energy conservation via its grants.

Metropolitan Airports Commission — In addition to improvements to the airfield lighting system, the MAC electrical shop has been performing a number of upgrades that more efficiently light up the airport. Incandescent lamps are replaced by compact fluorescent. Fluorescent fixtures use a more efficient T-8 lamp, and end of life ballasts shut down and don't draw current when a lamp fails. These upgrades have become standards in any new construction project.

Metropolitan Council – Environmental Services — Several retrofits to energy-efficient fluorescent lamps or high intensity vapor lamps have taken place at MCES facilities. However, unlike incandescent lamps, these alternatives are considered as a special hazardous waste due to their mercury content. In 2000, 2,427 lamps were recycled through Superior Special Services in Bloomington, a reduction of 19

percent from the previous year. Various fluorescent lamp change-out programs have been underway to replace older lamps with the new, thinner varieties (F30T8) that contain less mercury and are even more energy -efficient. Some facilities have installed motion sensor switches that turn off room lights if no motion is detected within 15 minutes.

Pollution Control Agency — A few years ago, the MPCA central building had four fluorescent lamps removed from each fixture and replaced two into each fixture. The lamps are more energy efficient and contain less mercury. Also, each fixture was converted to using one ballast rather than needing two ballasts.

The new Brainerd office lease specifies that full-spectrum lighting be installed and maintained. It also calls for the installation of additional exterior windows, including some that can be opened, in order to promote daylighting. MPCA has specifically designed the floor plan to allow the maximum amount of light to enter the workspaces. The agency is going to install a revolutionary new daylighting feature known as "tubular skylights" in the main conference room. The tubular skylights will be installed as a test to measure performance and energy savings. If successful, tubular skylights will then be added to several other building locations to enhance daylighting and reduce electrical energy consumption.

Minnesota State Colleges and Universities

Bemidji State University — A number of projects completed in FY 2001 will result in energy and cost savings. For example 2,400 watts of incandescent lighting was replaced by 760 watts of T8 fluorescent lighting in the BSU Field House. A $340 rebate was received for the project. Annual energy savings are predicted to be approximately 7300 kWh or about $300 at current rates. Emergency exit lighting for several buildings was connected to the emergency generator, allowing removal of the batteries previously used. Undetermined savings will be realized with the elimination of the annual battery maintenance and replacement costs.

North Hennepin Community College — The college is in the process of completing a new science facility, which will have energy efficient lamps, ballast, and motors. All of NHCC's used lamps are recycled by a licensed local contractor.

St. Cloud State University (SCSU) — As part of a $3 million energy conservation project with NSP, SCSU has shaved peak demand by about 25 percent. Occupancy sensors, LED exit lights, high efficiency fluorescent lights, and variable frequency motor drives also reduce consumption and pollution as does the computerized energy management system that was upgraded. Over 7000 florescent bulbs were recycled. Trash was burned in Elk River to produce electricity.

Department of Transportation — Mn/DOT has replaced old PCB ballasts and lights with non-PCB ballasts and energy efficient lighting in all of its buildings. Mn/DOT also has motion detectors throughout many of its facilities to turn off lights when rooms are not in use. Most Mn/DOT computers have a sleep mode, which turns off the screen when not in use.

University of Minnesota — The university has an ongoing green lights program to change out older, less efficient lighting as remodeling of buildings is undertaken at all campuses and facilities. Switching from 40-watt lamps to 32-watt lamps coupled with more efficient electronic ballasts saves energy. Other energy saving lighting strategies are evaluated for use on a site-by-site basis.

The university has updated its Standards and Procedures for Construction to address energy conservation in lighting systems to:

- select and design lighting systems and controls to ensure minimum consumption of energy while providing quality illumination for the visual tasks in each room or space.

- avoid general high levels of illumination except in the most critical applications.
- provide specialized supplementary lighting sources at the task area in lieu of uniform high level illumination throughout.
- provide for flexible levels of lighting through switching or other lighting control devices.
- minimize decorative lighting.
- consider the principles of daylighting for new buildings.

14. Energy - Production

Department of Administration — The Division of State Building Construction specifies and incorporates, where possible, the use of energy efficient triple-glazed windows to save on energy loss and heat gain in facilities. The Materials Management Division created a contract for window-mounted self-contained room air conditioners to emphasize performance, rather than design, establishing a minimum energy efficiency rating requirement for each size unit.

The Plant Management Division installed a new 1,000-ton chiller with high ratio turn down and high efficiency ratings. The new chiller was required for the additional cooling load of the Harold E. Stassen Building and provides improved operation and control of Capitol Complex cooling needs.

Department of Commerce — The Minnesota Energy Code interpretation and enforcement duties were transferred by statute to the Department of Administration's Building Codes Division in FY01. The department will continue to support the development and promotion of the energy code, but from an advocate rather than regulatory standpoint.

Solar Resource Assessment Program (SRAP). The department expanded SRAP from four sites in 1999 to eight sites in 2000. The equipment monitors solar resources at specific sites around the state. The information from these sites will be correlated with satellite-based information, with the goal of maintaining a public statewide database of solar insolation information for promoting solar energy.

Wind Resource Assessment Program (WRAP). The department continues to operate WRAP, expanding the program to include new sites in northeastern and southeastern Minnesota. In addition, the department is developing a wind monitoring loan program, which will help wind developers analyze specific locations for the potential development of wind power. This ongoing program uses GIS technology to map wind power resources for the ultimate development of wind energy installations. The WRAP report will be revised and released again in the fall of 2001.

Conservation Improvement Programs — Electric. The department oversees utility investment in conservation and demand-side management through implementation of Conservation Improvement Programs (CIP). All investor-owned electric utilities (except Xcel Energy) are required to invest 1.5 percent of their gross operating revenue into energy conservation projects, while Xcel Energy is required to invest 2 percent of its gross operating revenues. The commissioner uses the CIP process to promote sound, cost-effective conservation practices, which reduce or stabilize electricity consumption.

ELECTRIC ENERGY SAVINGS AND AVOIDED EMISSIONS DUE TO ELECTRIC CIP

	1997	1998	1999	2000	2001 (proj.)
Electricity (kWh)	487,148,984	299,418,391	214,160,804	302,905,644	249,591,805
CO_2 (tons)	287,426	176,662	126,359	178,720	147,264
SO_2 (tons)	523	321	229	324	264

Mercury (lbs.)	170	105	75	106	87
NOx (tons)	260	160	114	161	133

CO_2 — carbon dioxide, SO_2 — sulfur dioxide, NOx — nitrogen dioxides

Conservation Improvement Program — Gas. In addition to the electric CIP, the department oversees gas CIP projects. Six investor-owned gas utilities offer CIP projects, reviewed and evaluated by staff and subject to Commissioner approval. The utilities are required to spend 0.5 percent of their gross operating revenues on CIP. The Commissioner uses the CIP process to promote sound, cost-effective conservation practices, which reduce or stabilize gas consumption.

NATURAL GAS ENERGY SAVINGS AND AVOIDED EMISSIONS DUE TO GAS CIPS

	1997	1998	1999	2000	2001 (proj.)
Nat Gas (Mcf)	1,002,721	946,034	1,310,255	1,349,630	1,136,493
CO_2 (tons)	60,163	56,762	78,615	80,977	68,189
SO_2 (tons)	0.30	0.28	0.39	0.41	0.34
NOx (tons)	47.13	44.46	61.58	63.43	53.41
VOC (tons)	2.76	2.60	3.60	3.71	3.12
PM (tons)	3.81	3.60	4.98	5.13	4.32
CO (tons)	20.05	18.92	26.21	27.00	22.73

CO_2 — carbon dioxide, SO_2 — sulfur dioxide, NOx — nitrogen dioxides, VOC — volatile organic compounds, PM — particulate matter, CO — carbon monoxide

Conservation Improvement Programs — Legislation. Legislation passed in 2001 increases the responsibility for municipal and cooperative electric utilities to participate in the CIP process. The department is working with key industry contacts to assist with the transition.

Biogas Digester. The department continues to promote the use of agricultural manure resources for the production of energy and is investigating the installation of a swine manure digester to complement the existing dairy manure digester installed in 1999. Digester technology reduces manure odors, uses waste methane gas, and produces energy from manure, a renewable energy source. A 2001 legislative statute was passed giving qualifying new digester installations a $0.015/kWh incentive for energy production.

Tanks-Petroleum Storage. The Weights and Measures Division distributes a pamphlet to educate storage tank owners on the proper maintenance of petroleum storage. In the past, approximately 400 tanks a year had to be emptied due to contamination. The material was then treated as hazardous waste.

Minnesota Petrofund Program. The Minnesota Petrofund Program, housed at the Department of Commerce, provides a reimbursement mechanism to help businesses and citizens clean up areas where petroleum leaks have occurred. In conjunction with a project manager at the Minnesota Pollution Control Agency, consultants determine the extent of the contamination and the degree of its threat to human health or the environment. Contractors perform any excavation, trucking, soil disposal, or other service necessary to address the threat and clean up the site. Costs for these services are reimbursable through the Petrofund if they are determined reasonable and eligible according to the laws governing the program (Minn. Stat. §115C and Minn. Rules 2890).

Over the past decade, cleanup costs for approximately 6,000 sites have been reimbursed through the department's Petrofund Program at a cost of more than $250 million. These reimbursements are

funded by a $0.02 per gallon fee paid by bulk petroleum distributors. Payments to applicants have ranged from $221 to over $913,500. Maximum reimbursement for a cleanup is $1 million.

Department of Corrections

MCF-OPH — The facility changed from electric to gas appliances, and consequently more efficient equipment, in the main kitchen in 1996 with the statewide energy conservation program. At the same time, HVAC supply fan motors were changed from constant to variable speed drives in an attempt to conserve energy over a long-term period. The chiller was rebuilt this year at a cost of $34,000, which improved its efficiency and reduced down time due to necessary repairs on old equipment. A request has been put in for a new chiller, which will be more energy efficient and use non-CFC refrigerant. Complex ice machines, which were original equipment 20 years ago, were changed to a, energy efficient updated model in the past year. The Canteen freezer, also 20 year old equipment, was replaced with a more energy efficient freezer using more environmentally friendly refrigerant this year.

MCF-RC — The facility uses three 550-ton high-efficiency chillers that can be cycled on or off in stages with the building's automation system. With these chillers, cooling capacities are based on actual demands, and thereby conserve electrical energy. Generation of 3000 kW of electricity is utilized when necessary for peak power sharing by the utility company. This prevents the utility company from having to build additional power generation plants, which reduces pollution. The facility also makes use of alternative fuel for heating as it switches to fuel oil during times of natural gas shortages. A computerized energy management system allows the facility to monitor and control all electrical usage, enabling staff to identify and correct areas of high-energy consumption and low power factor.

MCF-SCL — Staff is evaluating possible installation of a facility generator, which would cost $1 million, with a payback of approximately ten years. With the generator, MCF-SCL would be able to use co-generation and power load shedding. The plan is undetermined until 2000-2002.

Office of Environmental Assistance — The OEA life-cycle analysis documenting resource conservation benefits associated with municipal solid waste source reduction, recycling, processing, and landfilling is available from the OEA Clearinghouse. The report includes a life-cycle inventory of resource conservation benefits from waste management in 1996 and a life-cycle assessment of greenhouse gas benefits from 1991 to 1996.

Metropolitan Council – Environmental Services — In 2000, the council spent $14.5 million on electricity and natural gas purchases. The eight WWTPs account for about 80 percent of the dollars spent on electricity and 65 percent of the natural gas purchases. Flue gas heat from the incineration of biosolids at the Metro WWTP is captured by an energy recovery boiler economizer system at a recovery rate of 40 percent. The steam produced from the boilers is used to heat the plant, to run pumps and induced-draft fans, and to accommodate the solids heat-treatment process needs. Approximately $1 million in fuel costs are saved each year by this energy recovery system.

Significant energy savings were realized at the Metro WWTP—one of Xcel Energy's largest single electric customers—beginning in 1997 due to changes in wastewater handling technology. Air is added to wastewater tanks during secondary treatment to promote the growth of beneficial aerobic bacteria and other microorganisms that consume dissolved solids. Conversion of the air delivery system to fine bubble diffusion has doubled the oxygen transfer rate and decreased the power required for the air compressors.

Power demand in 2000 was 154.1 million kilowatt hours per year, or 25% less than the years prior to fine bubble, with an annual cost savings of approximately $2.25 million! Overall power demand at the

plant will be 25 percent less than it was in 1996. This reduction can be converted each year into 8,130 tons of coal not being burned to generate electricity, thereby preventing 173 tons of nitrous oxides, 512 tons of sulfur oxides, and 58,500 tons of carbon dioxide in air emissions. The fine bubble diffusion project was awarded a MN GREAT! (Minnesota Government Reaching Environmental Achievements Together) award in 2000.

Pollution Control Agency — The MPCA central building energy management system uses timers for regulating the temperature during the evenings and weekends. Also, the system includes thermostats located throughout the building for individual staff to monitor for energy savings.

Minnesota State Colleges and Universities

North Hennepin Community College — North Hennepin Community College does not have standby generator capacity. No energy is produced at this site. Monthly usage of electricity and fuels are closely monitored to help insure efficient operation of facilities.

Department of Transportation — Mn/DOT has installed 67 waste oil burners in its maintenance shops. The waste oil burners allow Mn/DOT to burn waste oil as a supplemental heat, resulting in lower utility bills. Some of Mn/DOT's waste is used as waste-derived fuel for cement kilns. Waste includes oil-base paint, Zecol, Trichloroethylene, diesel fuel, and parts washer solvent. Some used oil sorbents are being burned to generate steam and electricity in an environmentally sound waste-to-energy technology.

University of Minnesota — A 15 MW co-generation steam turbine has been installed at the university's S.E. Steam Plant. The steam production is gas fired at least 70 percent of the time. This environmentally friendly electricity will displace the need for 15 MW otherwise generated by more environmentally problematic coal and nuclear plants.

In fall 2001, the university will install a 15 kW photovoltaic system on the roof of the newly remodeled Architecture Building. The unit, donated by Xcel Energy, will provide electricity to the building and be a training resource for future architects and engineers.

Spring 2002, the university will install 4.5 kW natural gas fuel cell, donated by Xcel Energy, at the St. Paul Dairy Barn. The unit will provide electricity and hot water (via heat exchanger) to the building and be a training resource for future architects and engineers.

The university's Department of Biosystems and Agricultural Engineering provides research, education and guidance in the area of anaerobic digestion of organic waste to produce methane as a fuel for energy generation (http://www.bae.umn.edu/extens/manure/index.html). There are preliminary plans for installation of a demonstration anaerobic digester at the St. Paul campus farm.

15. Groundwater Wells

Department of Administration — Plant Management and State Building Construction Divisions will upgrade the de-watering system in the Transportation Building to comply with new codes.

Department of Corrections

Most facilities— Most of the facilities are on city water and sewer, although some may have individual wells, which are used for watering purposes.

MCF-RC — Groundskeepers will use one well for an underground sprinkler system. Domestic

water is obtained through Rush City.

WR (Willow River) — WR has its own well and septic system. A new septic system was installed several years ago.

Metropolitan Council – Environmental Services — A water conservation project at the Metro WWTP uses treated effluent in place of on-site well water for non-potable service water purposes. In plant operations, this has resulted in a 35 percent reduction in groundwater use and a cost saving of over $1,300 annually for permit fees and electricity to operate pumps. This project received a MN GREAT! (Minnesota Government Reaching Environmental Achievements Together!) award for its accomplishments in P2 in 1995.

Minnesota State Colleges and Universities

North Hennepin Community College — There is one deep well on site, which is used for irrigation purposes only. This year NHCC will be looking at upgrading the pump to a more suitable horsepower and water flow rate, as the existing pump is in need of major repair/replacement and is oversized. Domestic water and sewer is obtained through the city of Brooklyn Park.

Department of Transportation — Numerous Mn/DOT maintenance facilities have underground monitoring wells installed in order to determine if aquifers have been impacted by petroleum releases.

16. Heavy Metals

Department of Corrections

MCF-OPH — Lead and mercury generated by health service's x-rays and dental activities are recycled. The facility sent three tons of (range) lead dust from the armory to scrap metal processors for recycling rather than let it collect or store it on-site.

MCF-SCL — The facility collects all mercury switches and lead-base paint chips for proper disposal at an annual cost of $500 for mercury removal and paint chip management. By doing this, SCL reduces environmental pollution to waterways, landfills, etc., and stays in compliance with MPCA rules. SCL plans to continue these recycling efforts.

Office of Environmental Assistance — OEA staff continues to work at the state and national level to develop policies and systems for managing mercury-containing wastes.

In late fiscal year 2000, OEA awarded a grant to Institute for a Sustainable Future to act as project manager for Clancy, the mercury-detecting dog, matching funds from Xcel Energy. This project, modeled after a similar project in Sweden, uses a trained dog to detect hidden mercury in schools and other institutions and facilities. Clancy also acts as an educator and ambassador on mercury and environmental issues. The project commenced in fall 2000 with the hiring of a dog handler by MPCA and training of the handler and Clancy by the St. Paul Police Canine Training Center. Clancy and handler Carol Hubbard successfully completed their mercury detection training in spring 2001 and began searching schools and other buildings for hidden mercury in summer 2001. Clancy was introduced to schools and the public at the Minnesota Science Teachers Association Fall meeting in October 2001. The project manager works closely with Carol Hubbard and MPCA to arrange school visits, develop print materials and mercury phaseout agreements, and track results of the project.

Also in fiscal year 2001, OEA developed a legislative proposal to phase out the sale of certain mercury thermometers in Minnesota. Two legislators brought forward similar proposals and the three proposals

were merged into a comprehensive prohibition on mercury thermometer sales in Minnesota. Limited exemptions are provided for thermometer uses required by law or rule, uses where no alternative is available, and for primary calibration standards where non-mercury standards are not available. The law was passed in the 2001 session and became effective January 1, 2002.

Mercury manometer replacement originally began when Tom Mosher, Wabasha County Solid Waste Officer, utilized a MnTAP intern in 1997 to estimate the prevalence of mercury manometers on Minnesota dairy farms and evaluate alternatives. The project was the foundation for implementing a change-out program implemented statewide through the Minnesota Department of Agriculture (MDA) with support from the Legislative Commission on Minnesota Resources (LCMR). MDA recently completed a report documenting its three-year effort to replace mercury manometers on dairy farms with non-mercury gauges in which 1,353 manometers (87 percent of those identified) and 1,134 pounds of mercury were removed from dairy farms. The LCMR grant paid for the replacement and proper disposal of the mercury manometers. Implementation of similar projects in the neighboring Great Lakes states of Wisconsin and Michigan has begun.

Metropolitan Council - Environmental Services — The MCES's IWPP section is responsible for enforcing the pretreatment program for over 800 permitted industrial users of the region-wide collection and treatment system. Substantial reduction has occurred in heavy metals released to the system due to these enforcement and education efforts.

Environmental benefits of heavy metals load reduction include compliance with effluent limits, compliance with receiving water quality standards, improved biosolids quality, reduced air emissions from biosolids incineration, and compliance with biosolids land application metals criteria. Economic benefits include reduced use of treatment chemicals and reduced disposal costs for biosolids that can now be beneficially reused. Please refer to the following table for actual values in pounds.

METALS LOADING TO METRO WWTP FROM INDUSTRIAL USERS

Metal	1980 (pounds)	2000 (pounds)	Reduction (pounds)	Reduction (percent)
Cadmium	4,585	302	4,283	93.4%
Chromium	64,755	7,007	57,748	89.2%
Copper	66,714	11,813	54,901	82.3%
Lead	10,600	2,900	7,700	72.6%
Nickel	43,128	5,153	37,975	88.1%
Zinc	90,931	11,061	79,870	87.8%
Total	**280,713**	**38,236**	**242,477**	**86.4%**

To further the reduction in metals loading, small volume industrial and commercial users—whose aggregate pollution load may be significant—are being studied. A survey was conducted and meeting held with furniture strippers. Radiator repair shops were evaluated for potential heavy metals in wastewater discharged to the sanitary sewer. A report was completed which includes best management practices to prevent metals from entering the collection system. The radiator shops are currently being considered for coverage by a general permit, which would be extended to shops meeting specific waste management and P2 criteria.

Mercury discharged to the collection and treatment system is still of concern. A partnership was established with the Minnesota Dental Association in 1998, which led to two studies to evaluate mercury discharges from dental clinics. These two studies were substantially completed during the fiscal year. The first study evaluated the effectiveness of advanced removal equipment of waste dental

amalgam. Samples from various styles of commercial equipment were collected and analyzed at the MCES laboratory. By the year 2000, seven dental clinics had participated with data collected for a cumulative total of 87 "dentist weeks." Also in 2000—with input from IWPP staff—at the University of Minnesota Dental School wastewater that originates from 370 chairs is now being pretreated by electronically controlled advanced filtration in an air/water separator tank.

The second study, a community-wide study of dental clinics in the cities of Hastings and Cottage Grove, has been completed. Beginning in June 1999 Phase 1 consisted of a baseline measurement of sludge mercury concentrations at both related treatment plants. Phases 2 and 3 involved installation of amalgam removal equipment in all dental clinics in the plant service areas (except for one in Cottage Grove; 13 total clinics participating) with concurrent monitoring of plant sludge mercury concentrations. Following the completion of the study in July 2001, it was found that a 44 percent reduction in mercury loading was achieved for the Hastings WWTP and 29 percent was achieved for the Cottage Grove WWTP. Therefore, significant reductions in sludge mercury concentrations can be achieved if dental clinics remove mercury wastes from the wastewater that the clinics discharge to the sanitary sewer system.

The P2 efforts regarding mercury have also included surveys of commercial laboratories, sampling companies, and environmental consultants. A survey of medical clinics was conducted and the results entered into a database. In its own operations, MCES has adopted a Mercury Reduction Strategy and formed an interdepartmental Mercury Core Team. Specific surveys have been conducted to identify all activities using mercury and to inventory all equipment containing mercury for the purposes of reducing use and for replacement with mercury free equipment. Influent monitoring closely measures mercury coming into the treatment plants.

The Metropolitan Council has taken action in its employee benefits package to encourage all of its approximately 8,000 employees to use mercury-free fillings for dental cavities. In 2000, the council renegotiated the contract with its provider, Delta Dental, to cover the full cost of mercury-free alternatives to the traditional mercury amalgam for fillings.

In another P2 related benefit to its employees, a very successful mercury thermometer exchange program was initiated in 2000. Employees could exchange household fever mercury thermometers for digital ones. The mercury units were, in turn, recycled through county hazardous waste collection programs. The goals of the MCES program were to support the Mercury Reduction Strategy by removing mercury containing instruments from homes and to raise the awareness of concerns of mercury in the environment among employees. The thermometers were initially exchanged to coincide with the autumn employee flu shot program; and exchanges continued until the supply of new digitals ran out. A total of 298 mercury thermometers, along with a few other miscellaneous mercury containing devices, was collected.

Minnesota State Colleges and Universities

North Hennepin Community College — Hazardous waste disposal for instructional chemicals is handled through the University of Minnesota.

St. Cloud State University (SCSU) — Campus-wide efforts are underway at SCSU to minimize mercury use and mercury thermometers. Waste photographic paper and chemicals are processed off-site to render them nonhazardous and to recover silver. Conversion to a bulk storage and transfer process for spent photo fixer has cut costs. Several conventional darkrooms across campus including ones in Environmental and Technological Studies have been removed., replaced with electronic imaging systems. About 100 pounds of video film has been recycled through Generic Media of Minneapolis thanks to MnTAP's source materials exchange listings. Minor amounts of gold, silver, copper, and palladium were recovered from our electronic recycling

program.

Department of Transportation — Mn/DOT developed a manual (see section 33, *Technical Support)* for removal of lead paint and is researching ways to recycle lead-contaminated waste generated through various removal technologies. Mn/DOT has changed from paints and inks containing heavy metals to lead-free products. See also section 24 *Paints, Coatings, Stripping* and section 30 *Procurement.*

University of Minnesota — Proactive programs for minimizing mercury and other heavy metals on campus and capturing heavy metal containing waste at its source should result in a reduced potential for mercury and other heavy metal discharge to the environment.

UM-Duluth is participating in the Great Lakes zero discharge project which among other chemicals focuses on mercury. Excess and waste mercury is being collected and shipped off-campus for proper reclamation or disposal. Mercury-containing devices are being systematically replaced with non-mercury devices. The university is systematically cleaning drain systems on campus, emptying traps and removing biomass buildup, to eliminate accumulated mercury from the wastewater system.

The University of Minnesota is cooperating with MCES in a pilot study to reduce mercury in dental clinic wastewater. The Boynton Health Center Dental Clinic has installed a micro-screen system in its chair-side wastewater system to capture fine particles of mercury amalgam filling material before they enter the sanitary sewer. University Facilities Management plans to install a cloth filter system at the out flow of the Dental School Clinic's (350 chairs) central chair-side wastewater collection tank to capture fine particles of mercury amalgam filling material before they enter the sanitary sewer. MCES will assist in evaluating the success of these systems in reducing the soluble mercury discharged to the sanitary sewer system. If successful, these systems would be recommended to other dental clinics.

The university's updated steam plant can burn a fuel mix which is 70 percent or more natural gas rather than the traditional mostly coal fuel mix. The displacement of coal, the major source of atmospheric mercury, as the primary fuel can eliminate several pounds of mercury from the steam plant's annual air emissions into the environment. Facilities Management's continued effort to reduce steam and electricity use at the university also reduces the amount of mercury released at the coal burning steam and power plants.

The University Purchasing Department has finalized a contract with a distributor that will provide low-mercury fluorescent lamps as the default choice for most lighting applications to university customers. This will cut down on the amount of mercury on campus. The university collects spent fluorescent lamps from all of its campuses and has them recycled for mercury recovery. In 2000, some 95,000 fluorescent lamps (8 pounds of mercury) were recycled. The university offers fluorescent lamp recycling service to educational institutions throughout the state via its Chemical Safety Day Program (http://www.dehs.umn.edu/csdp). The Chemical Safety Day Program, which has operated since 1981, provides chemical waste management services to Minnesota schools.

University of Minnesota Stores and Environmental Health and Safety (DEHS) celebrated P2 Week 1999 by initiating a laboratory mercury thermometer exchange program. Participants received a free non-mercury thermometer for each mercury thermometer surrendered with a limit of two per customer. The purpose was to capture mercury thermometers and to create a customer base for non-mercury thermometers by placing them into labs. The goal was to exchange 500 thermometers and to collect an additional 500 mercury thermometers. The project used e-mail listserve and handbill advertising. Five drop-off collection sites on the Twin Cities campus were available for two hours each to exchange thermometers and distribute information about mercury use and management in the laboratory. The project got participation from 235 laboratories, took in 796 mercury thermometers,

and distributed 518 non-mercury thermometers. Proactive programs of minimizing mercury on campus and capturing mercury waste at its source should result in a reduced potential for mercury discharge to the environment.

17. HVAC, Indoor Air Quality

Department of Administration — The Division of State Building Construction specifies and administers proper flame spread materials for interior finishes to reduce or eliminate the spread of fire and toxic fumes. The division continues to administer and enforce indoor air quality standards of the Minnesota State Mechanical Code in state-owned facilities, public schools, hospitals, nursing homes, supervised living facilities, and prefabricated construction. The Resource Recovery Office uses a programmable thermostat in the State Recycling Center to reduce energy used for heating.

The Building Codes and Standards Division continues to administer and enforce indoor air quality standards of the Minnesota State Mechanical Code in state-owned facilities, public schools, hospitals, nursing homes, supervised living facilities, correctional facilities, and prefabricated construction. The Building Codes and Standards Division also enforces flame spread rating for materials on interior finishes. The Plant Management Division is coordinating with Department of Employee Relations' Industrial Hygienists to develop janitorial procedures for indoor air quality procedures and standards for statewide recommendations. The Materials Management Division has developed a contract for laboratory analysis of air-monitored and bulk samples. The InterTechnologies Group uses Freon for all the standalone air conditioners located at three Computer Operations Centers.

Department of Commerce — Minnesota Energy Code. See section 11 *Education, Communication and Training* in Part 3.

Department of Corrections

MCF-OPH — Over the past four years, OPH has made numerous HVAC upgrades to improve and update existing ventilation systems in order to provide adequate indoor air quality and appropriate temperature control. A new Energy Management System was installed providing more efficient control of mechanical equipment with the ability to selectively turn off equipment during non-occupied hours, reducing energy costs. Each year different HVAC systems will be identified for renovation. To date approximately $250,000 worth of upgrade has been implemented. There is no data at this time regarding energy saved.

MCF-OPH — Fans and duct liners are cleaned annually and filters changed quarterly, as part of an ongoing plan to eliminate air quality problems due to microbial material which has grown on duct liners over the years. Dryer exhaust vents are annually cleaned in the living units. Air quality is specifically tested in various areas quarterly to ensure problems are resolved or do not arise. Corrective measures of cleaning and coating the fans and duct liners have been revised to begin the use of external insulation on duct work rather than the internal coatings. High efficiency air cleaners have been installed in Industry areas.

MCF-RC — RC switched to high efficiency filters, which are replaced every six months. The facility uses antibacterial pads in condensate drip pans to prevent any bacterial growth. Outside air intake is monitored via the computerized building automation system to ensure that fresh air intake meets the Indoor Air Quality standards. Air circulation is tested annually by an independent source as required for ACA accreditation.

MCF-SHK — The facility has preventive maintenance programs to clean HVAC equipment. Filters are changed quarterly.

Metropolitan Airports Commission — A recent energy audit performed at the Lindbergh Terminal revealed that a significant reduction in energy usage could be realized with a few minor modifications. A number of adjustments were made to the software controlling the air handling units to maximize their efficiency. These changes resulted in immediate and noticeable reduction in energy consumption and related costs.

Metropolitan Council – Transit Operations — Metro Transit has worked in this area since 1991 when it conducted its first study of the air handling systems at the Ruter Garage. That study focused on the new standards required by the MPCA and when changes would have to be made to meet those standards. Based on that study, a completely new system was installed in 1995 to allow the garage to operate within the required standards. Additional studies have been completed for the Snelling Garage (1995) and the South and Heywood Garages (1997).

Metro Transit installed a new exhaust system in the body shop/welding shop area of the Overhaul Base. These changes have significantly reduced the amount of dust given off by the sand blasting and sanding processes in these areas. It also reduced the noise levels in the building while performing these jobs.

Metro Transit is currently designing a system that will use waste heat from the Hennepin County garbage burner to supplement heat in its Heywood Garage and office building. This system would preheat all air coming into the air handling system and reduce emissions from natural gas and fuel oil by 40 percent. If funds become available, these modifications will be installed in 2002. The agency has requested additional funds to renovate the air handling systems in its South and Heywood facilities. If these funds become available to Metro Transit, the modifications will be made in 2002.

Pollution Control Agency — At the MPCA central office, an additional fan has been installed to improve the indoor air quality on each floor. The new Brainerd office lease requires the use of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) approved minimums for fresh air intake, filter efficiency, and filter replacement to be incorporated into the Heating, Ventilating, and Air Conditioning (HVAC) system. Other requirements are specified to ensure that the building maintains good indoor air quality.

Minnesota State Colleges and Universities

Bemidji State University — In FY 2001, 50 ton and 150 ton air conditioning units serving the administrative services building were removed. A central chiller now serves the building. The chiller is a more energy efficient closed loop system that reduces the loss of refrigerant gases and other chemicals used in the process, resulting in energy and cost savings. New variable frequency drive motors for our HVAC systems were installed in the Student Union.

North Hennepin Community College — The college will be starting a program of monitoring/test indoor air quality on an annual basis. Each year, a qualified lab technician will test air quality in one of the more recently renovated and one of the older buildings on campus, findings and recommendations will be documented.

St. Cloud State University (SCSU) — SCSU is using a carbon dioxide chart recorder to assist in ventilation troubleshooting. Custodial staff and HVAC personnel have become much more involved in complaint response. Many special forms are being used to procure and track occupant data. MacNeil Environmental Inc. has performed six air sampling surveys expanding to seven buildings. Water-based paints and varnishes and strict new carpet emission controls are used extensively to limit VOCs.

Minnesota Department of Administration, Facilities Management Bureau “Building Air Quality” 5/95 guidelines for building owners and facility managers have been extensively studied and

implemented. High efficiency vacuum cleaner bags and HVAC filters help.

University of Minnesota — The university hosts an IAQ web page (http://www.dehs.umn.edu/iaq) and web links (http://www.dehs.umn.edu/outsidelinks) to disseminate information about various aspects of indoor air quality (design, health effects, contaminants, etc.). The information includes both chemical and microbiological agents and covers home, school, and business situations. Check these sites for terrific fungal pictures and information. Expected benefits from this education are a reduction in indoor air quality complaints and improved worker health.

The university's 2002 legislative capital request includes a project to replace aging building chiller units on the St. Paul campus with an energy efficient centralized chiller plant. Preliminary plans are underway and a prospective site has been determined for a centralized chiller plant on the St. Paul campus. Cost estimates for the plant, which would eventually connect all buildings and more efficiently provide cooling, are based on a prospective location south of the campus steam plant, near the Sarita Wetland. If a plant is not built, most of the chillers on campus would have to be replaced, and that would be much more costly. Buildings on the St. Paul campus have their own chillers, but many of them are nearing or beyond their functional life span.

Of 38 chillers used on the St. Paul campus, 32 are in dire need of replacement in the next six years. Current plans call for a plant to house five large chillers that would be linked to campus buildings. Because of energy codes and the space existing chillers occupy, new chillers would have to be electrically powered. This is expensive and would mean those buildings would have little power for other needs.

There are efficiencies to be gained by centralizing all that cooling. Much of the efficiency would come in maintenance- and operation-cost savings. Without accounting for inflation, a central plant, rather than replacing the chillers, would save the university $9 million over the next 25 years. Furthermore, the new buildings on campus have stand-alone systems but were built so they could eventually be connected to a central plant. Funds for the first phase of the project, which would build the plant and install two chillers, total about $18.7 million and will be part of the university's 2002 legislative capital request. Over the next eight years in three more phases and funding requests, three more chillers would be installed and more buildings would be connected under the plan.

The HVAC system at the IWMF hazardous waste facility was tested and modified to properly balance the air flow to design specifications and to reduce or remove air flow where appropriate to make the building more energy efficient. The project was able to reduce annual energy costs/use by 15 percent with a project payback of approximately three years.

18. Ice Control, Sanding

Department of Administration — The Materials Management Division and the Department of Transportation have developed a contract for alternative blend deicer being used in a mixture of 100 percent Ice Ban M50, mixed with 5,200 tons of salt, and 1,150 tons of sand. This blend is then mixed into road salt at the rate of eight gallons per ton of salt. This blend reduces the salt use and can be used successfully at lower temperatures. The Plant Management Division is currently testing various programs to reduce chemical usage during the winter season

Department of Corrections

MCF-OPH — Sand is the principal product used in the units and on roadways when needed for ice control. Each spring the roads and parking lots are swept, and the sand disposed of so it does not wash down the drains to the St. Croix River.

MCF-RC — The groundskeepers use magnesium chloride ice preventer for use on walks. Sand is the principal product used in the units and on roadways when needed.

MCF-SCL — The facility uses no salt-based products on sidewalks into the facility. Our cost is $5,000 annually. The practice reduces groundwater contamination, causes less grass kill, and less tracking of salt into the facility. SCL plans to continue using salt-free ice control.

MCF-SHK — The facility uses supplies from the Department of Transportation for parking lots. For sidewalks, SHK purchases supplies through the state contract.

Department of Human Services — METO continues to use potash for ice control. The potash provides traction, eliminates ice, and reduces the amount of material tracked into buildings.

Metropolitan Airports Commission — MAC Field Maintenance continually evaluates ice control methods for runways, taxiways, and roads. A number of products are approved for use by the FAA on airport runways and taxiways. MAC Field Maintenance has found two that fit the delicate balance of being as environmentally friendly as possible while performing to exacting standards. Solid sodium acetate and liquid potassium acetate are applied based on a variety of conditions, including type and amount of precipitation, as well as temperature.

It has been found that mechanically removing ice and compacted snow may be more effective in some cases than the use of chemicals. Over the past six years, MAC has added runway brooms to its fleet of snow removal equipment. Starting initially with two, the fleet now boasts 14. Built almost exclusively for airports, these 32,000-pound units are powered by two 350-horsepower diesel engines. An 18-foot-wide rotating broom essentially strips the pavement bare of any ice or snow in a single pass. They can be operated at 25 to 30 mph and are staggered with plows and blowers in a “conga line” that can clear the width of a runway in two passes. The use of these brooms greatly reduces the need for chemical deicing, and in many cases eliminates it entirely. It is estimated that chemical deicing has been cut in half through the use of runway brooms.

Aircraft deicing performed by tenant airlines using glycol-based deicing fluid is another form of ice control. MAC has a glycol collection system at MSP, which is designed to significantly reduce the amount of aircraft deicing fluid discharged to the Minnesota River. Aircraft deicing takes place on concrete de-ice pads located near the runway ends. Impacted runoff from the pads is collected and contained on site until it is transported for recycling or discharged to the sanitary system for treatment under an Industrial Discharge Permit with Metropolitan Council-Environmental Services (MCES).

Four glycol recovery vehicles (GRV) are also used by the airlines to vacuum-sweep the surface of deicing areas. Glycol collected in this manner is highly concentrated and therefore more easily recycled than what is pumped from the containment system.

Metropolitan Council – Transit Operations — As part of the supplementing heating source system, Metro Transit is looking at installing a snow melt system around its Heywood Garage and office thereby reducing the amount of salt that is used at the facility. The system will be installed in 2002 if the funds become available. During the 1997-98 winter season, Metro Transit investigated the recycling of floor sweepings from the service garages. This would remove the sand from the streets that is tracked into the garages on buses and remove it from the waste disposal stream. This idea is still under consideration, particularly in conjunction with the removal of sand and grit from traps and sumps in the bus washes. Initial study results would require drying the sweepings before reuse. If an inexpensive way of drying can be found further studies will be done.

Minnesota State Colleges and Universities

North Hennepin Community College — All sidewalks are cleared of snow and ice, and Ice Melt is applied as needed throughout the winter. No environmentally hazardous materials are used. Plowing contractor performs snow removal from parking lots. The college determines when and where to sand parking lots in order to keep sand use to only what is needed.

St. Cloud State University (SCSU) — Masonry sand works well by not being too abrasive on our SCSU equipment. Salt use in sanding mix was minimized by controlling salt content based on outside temperature. The small stockpile of mix was kept on a slab and covered with tarpaulins to control salt leeching.

Department of Transportation — Mn/DOT conducts extensive research annually on ice control equipment, materials, and methods. This research has shown some dramatic results. Mn/DOT has seen approximately a 25 percent reduction in salt applied per lane mile from the 1992/1993 to the 1995/1996 snow and ice seasons. The largest success to date comes from the research into pre-wetting of salt or salt/sand mixes for snow and ice control. Pre-wetting methods have reduced salt/sand use by 20 percent or more.

In the past few years, new non-salt deicers have entered the marketplace. Mn/DOT is interested in identifying replacements for salt that demonstrate lessened environmental impacts while maintaining or increasing roadway safety. Mn/DOT is currently developing a screening process with which these new products can rapidly and effectively be tested. It is anticipated that deicing chemical and abrasive use can be reduced even further with equipment innovations such as zero velocity spreader, greater use of road weather information, anti-icing and pre-wetting methods as well as operator training. A report is available.

University of Minnesota — The university's Facilities Management Grounds service group closes off unnecessary walkways and stairs in the winter months to reduce the snow removal and ice control efforts at the university. Less salt is used and therefore less salty runoff is generated. Less snow removal means fuel savings from snow removal machinery. Less labor, less salt and less fuel burned are balanced against very little loss in utility or safety.

19. Laboratory

Department of Administration — The Materials Management Division's hospital and medical supplies contract is consistently updated to introduce environmentally appropriate products. Recent additions include non-latex alternatives, such as gloves, syringes, bandages, and blood pressure cuffs. Sharps containers made from recycled plastic and non-PVC-produced tubing and intravenous bags are now also available.

The Materials Management Division's laboratory supplies contract, where scientifically possible, provides alternatives to laboratory media containing formaldehyde and heavy metals. MMD, in conjunction with the Pollution Control Agency, has three regional contracts for environmental sampling and analysis. The Plant Management Division and Division of State Building Construction are designing high-efficiency, energy-saving hoods for the laboratory floor of the proposed Bureau of Criminal Apprehension building.

Department of Agriculture — The Agronomy work unit's Inductively Coupled Plasma Mass Spectrometer (ICP/MS) has helped in reduction of the heavy metals mercury waste stream that was created by the use of the Kjeldhal apparatus.

By reduced use of this apparatus during the past year, the amount of mercury waste generated has been reduced from approximately 25 gallons in 2000 to 15 gallons. This has shown a saving of $2,500 this year on hazardous waste removal. Alternative method development and additional equipment is being investigated to further reduce this waste stream.

The report generated from our Minnesota Technical Assistance Program (MNTAP) internship presented the laboratory with alternative ways to reduce the amount of methylene chloride used in the Environmental Analysis work section. MDA is doing further research on methods and method development, which may help to reduce the amount of waste produced in this area.

Department of Commerce — The Weights and Measures Division receives petroleum samples from various Minnesota Petroleum distributors and retailers for testing. The waste remaining after testing is either returned to the petroleum company for further refining or added to the division vehicle tanks.

Department of Corrections

MCF-OPH — OPH has only Health Service labs. Medical and bio-hazard waste is transported as needed by BFI Medical Wastes under a state contract.

MCF-RC — All biohazard lab products are collected monthly by Medical Safety Systems, Inc.

MCF-SCL — All biohazard products are collected and disposed of properly (incinerated) at an annual cost of $2,000. This reduces chances of health contamination, controls sharps, and helps SCL comply with OSHA's blood-borne pathogen standard. The facility plans to continue to dispose of laboratory products per federal and state regulations.

Metropolitan Council – Environmental Services — MCES operates its own analytical laboratory at the Metro WWTP. Approximately 250,000 analyses are conducted annually in biological, physical, organic, and inorganic chemistry to support plant operations, industrial waste monitoring, water resources management, and research and development. P2 progress has resulted from the incorporation of microanalytical techniques, automation, solid phase extraction (SPE), and supercritical fluid extraction (SFE).

SFE has reduced the use of methylene chloride by over 90 percent and the use of acetone by 75 percent. The SPE cleanup techniques have reduced or eliminated the use of acetone, hexane, elemental mercury, ethyl ether, and methylene chloride from the PCB/pesticide method. A constant goal is to reduce the use of organic solvents to the lowest levels possible. Another micro-technique is employed for cyanide analysis, which further reduces the use of toxic chemicals.

During 2000, the laboratory continued to benefit from the energy saving design of its new facility. P2 efforts in the new building's construction have resulted in energy savings through the use of waste heat for steam heating generated elsewhere at the plant during the sludge incineration process. In addition, variable volume air handlers have reduced the demand on the heating, ventilating, and air conditioning system at times when air usage is low. Lastly, recycled materials used in the construction of the building have remained serviceable and have been resistant to wear in a laboratory environment.

Metropolitan Mosquito Control District — The district operates entomology labs at the St. Paul facility which use ethyl alcohol to preserve insect specimens collected in the field. Improvements in the lab procedures to recapture and filter the alcohol allow the district to reuse ethyl alcohol as many as four times before it is disposed of.

Pollution Control Agency — The MPCA Air Quality Lab has a temperature and humidity controlled room for the handling of PM2.5 filters and additional refrigerator space for the storage of PM2.5

filters to meet EPA guidelines. Tank Tie Downs in the Tank/Hazard Storage Room to comply with State Fire Marshall Code.

Minnesota State Colleges and Universities

Bemidji State University — The BSU Chemistry Department continues to incorporate microscale laboratory techniques into its courses. This reduces both the amount of hazardous wastes generated and the amount of new chemicals needed.

North Hennepin Community College — The college contracts with MacNeil Environmental on a yearly basis to provide professional technical expertise in this area.

St. Cloud State University (SCSU) — MacNeil Environmental Inc. (MEI) trained Biology, Chemistry, Earth Science, Environmental and Technical, and Physics staff and faculty last winter on pollution prevention and waste minimization at SCSU as part of OSHA Laboratory Standard training. MEI's role has expanded to include principal consultants, special audits and newsletters.

The Chemistry Safety Committee and Chemical Hygiene Officer (CHO) have been instrumental in fostering better lab user training, labeling, eyewash/shower inspection and hazardous waste control. They have assisted the expansion of SCSU's hazardous waste disposal and recycling program. A new staff member has been added to the SCSU Chemistry department to better focus in these areas.

After-hours work controls and the Chemical Hygiene Plan (CHP) have received special emphasis in all College of Science and Engineering (COSE) departments that have labs. Renovations have included the addition of seven plumbed eyewashes or showers and the plumbing upgrade of seven other laboratory showers. Better formaldehyde controls are being researched.

Department of Transportation — Some Mn/DOT materials laboratories have replaced 1,1,1-trichloroethane with n-propyl bromide used with asphalt extraction waste. 1,1,1-trichloroethane is hazardous and very expensive to manage and dispose of. N-Propyl Bromide waste is nonhazardous. In addition to being nonhazardous, n-Propyl Bromide can be recycled in-house and reused.

One Mn/DOT materials laboratory has substituted vinegar for muriatic acid. muriatic acid was used to clean air pots and other laboratory equipment. It was found that if the equipment were allowed to soak in vinegar overnight, the equipment would wipe clean the next day.

University of Minnesota — The University of Minnesota includes pollution prevention as part of the chemical waste management training for all laboratory workers. The training manual provides suggestions, information resources, and reporting documents (http://www.dehs.umn.edu/hwd/guidebook).

The University of Minnesota Department of Environmental Health and Safety did a pilot project to identify and recycle via distillation laboratory waste solvents that are amenable to distillation and are marketable to university laboratories. Initial successes have produced marketable hexane, acetone, and acetonitrile. The solvent recycling means both less virgin solvent produced and less waste solvent to be disposed of. The projected cost savings to the university, if the distillation and marketing focused solely on acetonitrile, would be $800 disposal costs avoided and $30,000 solvent purchase avoided for the annual system capacity of 1200 liters of recycled acetonitrile. Total projected annual costs are $10,800 that yields a net annual saving of $20,000. Benefit is totally dependant on the price of virgin material that is being replaced and the quality of product from the distillation process.

20. Landscaping

Department of Corrections

MCF-RC — In the past year, the facility has planted well over 100 trees. RC also preserved the run off ponds for wildlife.

MCF-SCL — SCL planted a five-acre area of native grasses and wild flowers at a cost of $2,000. It was a beautification project but will provide cost savings of $525/year, with a payback period of approximately 3 to 4 years. The facility plans to continue maintenance of the area, with a burn-off every three years and pulling weeds in between.

Pollution Control Agency — The central office landscaping committee has established a natural garden area in the front of the building in place of mowed grass. This garden meets several goals: less watering, fewer pesticides, colorful/attractive seasonal entrance, and an extra benefit for wildlife (butterflies, birds, insects). The new Brainerd office will be reviewing and approving all exterior landscaping plans. They have requested that native, drought-tolerant landscape plants be used around the building.

Department of Transportation — Mn/DOT uses an integrated vegetation management approach for managing roadside vegetation. This limits the use of herbicides. Mn/DOT uses wood mulch in and around various plantings to conserve water and help control weeds which reduces, if not eliminates the need for a pesticide. Mn/DOT's specification for wood mulch promotes the use of locally generated non-treated wood waste. Erosion control slope stabilization that uses compost applied by air blowers has been performed with excellent results.

Mn/DOT offers a CD-ROM titled *Woody and Herbaceous Plants for Minnesota Landscapes and Roadsides.* Mn/DOT developed this program to aid in selecting of plants for challenging roadside landscaping in Minnesota. Many cities, counties and consultants use the landscaping specifications and details (such as plant selection, compost material and mulch) developed by Mn/DOT. The design/build process has been aided by this expertise.

Minnesota State Colleges and Universities

Bemidji State University — A moratorium on herbicide and fertilizer application to lawns around a single-parent family housing dormitory continued. BSU is cooperating with the Minnesota Department of Natural Resources and Beltrami County to restore and stabilize the Lake Bemidji shoreline. This spring a 220-foot section of campus shoreline was stabilized with rock, plants, and other natural materials. Native aquatic plants were planted to replace the lawn and return the shoreline to a more natural condition. BSU contributed materials and labor to install a fence for this project. Approximately $20,000 has been committed to continue the project for next year.

University of Minnesota — In 1999, a small group of faculty, staff, and students started the Sustainable Campus Initiative Committee (http://www.cnr.umn.edu/sci), an ad hoc committee with a mission to use the campus and its physical facilities as a tool for environmental learning. One of the pilot projects is the Sarita wetland restoration on Twin Cities campus. The wetland restoration began with a cleanup during Beautiful U Day in September 2000. Implementation of the restoration began in the spring of 2001 and will continue through the next few years. On September 25, 2001, students, faculty, staff and community volunteers will build the first rain garden on the university campus as a part of Beautiful U Day 2001. The rain garden will reduce the storm water and runoff pollution that flows to the Sarita wetland and eventually to the Mississippi River. The rain garden project developed out of a student research paper done for a water quality class. More rain gardens and other pollution

preventing landscape storm water management projects will be championed by the committee as future new construction and building renovation projects provide opportunities to change the landscaping of the campus (see http://www.stormwatercenter.net and http://www.dakotaswcd.org).

The proposed St. Paul campus project to replace aging building chiller units with an energy efficient central chiller plant also provides the opportunity to make this campus a national model for storm water management. The Sustainable Campus Initiative is collaborating with Facilities Management and other departments to implement a plan to improve storm water management on the St. Paul campus without increasing the cost of the chiller plant project. When large storms come through the area, up to four feet of water rushes through the wetland in a short period of time, washing out most of the wildlife. This storm water "bounce" prohibits the wetland from sustaining natural animal and plant life.

According to Environmental Protection Agency regulations, the university must implement a storm water management plan by November 2002. Therefore, the university must correct storm water runoff that flows through the Sarita Wetland. If water infiltration gardens and other storm water management facilities were installed in the northern part of campus, the storm water runoff in the Sarita Wetland would be reduced. Connecting all the buildings to the chiller plant through underground piping, will require much of the campus to be dug up. When those holes are filled, grading on the landscape could be altered or rain gardens could be installed, redirecting, slowing down and reducing campus runoff. The university needs to replace lost vegetation, so putting in plants to alleviate the storm water runoff would be a practical solution. Sarita Wetland and the storm water infiltration gardens throughout the campus can be used for teaching as well as research. The storm water management infrastructure throughout the campus might become an important teaching and research tool for faculty and students.

The University of Minnesota Extension maintains a web site entitled Sustainable Urban Landscape Information Series (SULIS; http://www.sustland.umn.edu/). This outstanding site offers a detailed guide to designing, creating, and maintaining sustainable urban landscapes. Aimed at both the public and the horticulture/landscape industry, the site is composed of four main sections. The first section, Design, takes users through the process of envisioning, planning, and designing landscapes that are cost-effective, visually pleasing, and easy on the environment. The Plant Selection section overviews the basics of selecting plants for landscapes and includes an excellent plant selection database. With detailed information and photos of over 1,200 plants, the database is worthy of an annotation in itself. The Implementation section covers preparation, planting, installation, and construction of urban landscapes, with several illustrated how-to projects. The final section, Maintenance, offers a comprehensive guide to lawn care, with additional features on tree, shrub, and plant care planned for the future. A collection of links to related land grant university and extension sites rounds out the site.

The University of Minnesota's College of Architecture and Landscape Architecture provides landscape training and research (http://gumby.arch.umn.edu/landscape_architecture/default.html). Landscape architecture is the design, planning, and management of the landscape to create environments that embody ecological function and realize human aspirations for community, health and safety, and beauty. Landscape architects are concerned with a wide range of projects: large-scale regional landscape planning; design of exterior environments for working, living, and recreation; commercial, institutional, and industrial development; transportation systems; and multiple-use areas. Professional services include studies of land use feasibility, suitability, and capability; site selection studies; proposals for site layout and regional land use allocation and management; detail grading; construction drawings; and planting plans. Landscape architects often interact with other professionals such as architects, planners, engineers, geographers, physical scientists, social scientists, and others in developing projects.

The cornerstone of the university's Landscape Architecture program is design informed by ecological understanding. National leadership in research and active testing of design ideas locally and nationally give the department a powerful springboard for innovation in design. Collaborative opportunities within the college and university offer further means of realizing the potential of landscape architecture as well as a means of asserting the necessity for ecological responsibility in design and planning.

21. Materials Exchange

Department of Administration — The Materials Management Division through its Surplus Services administers Minn. Stat. Chapter 16C.23, subd. 6, which directs the commissioner of Administration to dispose of state surplus, obsolete, and recyclable property to obtain optimum property utilization within all state agencies and governmental units or nonprofit organizations in Minnesota. Any remaining property is subsequently sold by public auction, sealed bid, pre-priced sale, or by negotiation as deemed most advantageous to the state and in accordance with state law and guidelines. Property that has outlasted its effective usefulness and is considered beyond economical repair with no further utility value to the state, governmental unit, or nonprofit organization in Minnesota is recycled in accordance with OEA's Product Stewardship policy proposal.

The Resource Recovery Office encourages customers to obtain reusable office supplies from the State Recycling Center. Within 18 months, 13 agencies obtained free supplies 91 times from this facility. The Travel Management Division's material exchange is accomplished through Surplus Property when property has useful life remaining.

Department of Corrections

MCF-OPH — Rechargeable batteries are returned to the vendor per state contract. Useable items, such as furniture, are sent to other facilities or to state and federal surplus. Pallets are picked up and shredded for mulch under a program available through the MCF-STW. Computers are sent to the Computers for Schools program at the MCF-STW where they are upgraded and forwarded or disassembled for parts. Otherwise, they are recycled through a computer-recycling company that charges a disposal fee. Corrugated board is baled and recycled to Rock Ten in a joint program with MCF-STW.

MCF-RC — Cardboard is recycled, and RC contracts with a vendor to pick up and reuse the pallets. Cooking oil and lard is picked up and recycled by an outside vendor. Food waste is picked up by a pig farmer twice weekly. RC has also set up a plastic recycling program.

MCF-SCL — The facility recycles cardboard (credit $1,500); pallets (500 pallets recycled); metal (scrap iron, credit $1,450). The facility has no landfill disposal costs for these materials. The facility plans to continue its recycling efforts.

Office of Environmental Assistance — In 1993, the OEA formed the Minnesota Materials Exchange Alliance, a group composed of counties and agencies interested in maximizing materials exchange opportunities. The mission of the alliance is to develop an effective materials exchange infrastructure in Minnesota and to foster coordination and greater utilization of the state's potential for reuse.

Materials exchange programs in Minnesota:

Minnesota Technical Assistance Program	612-624-1300 or toll free 800-247-0015
Chisago County Materials Exchange	651-213-0879
Northcentral Materials Exchange	218-547-7428
Northeast Minnesota Materials Exchange	800-247-0015
Otter Tail County Materials Exchange	218-739-2271
Southeast Minnesota Recyclers Exchange (SEMREX)	507-529-4526
Southwest Minnesota Materials Exchange	507-537-6733
West-Central Materials Exchange	218-299-7333

During 2000 and 2001, MnTAP worked with 720 contacts among businesses and organizations seeking to exchange solid and hazardous waste materials for reuse. Businesses and organizations exchanged more than 2.4 million pounds of material, saving customers over $654,898 in avoided purchase and disposal costs. Catalog and Web listings resulted in a total of 377 exchanges, exceeding the annual goal of 120.

MnTAP staff worked the with local exchange sites providing needed information to help them function as part of the Minnesota Materials Exchange Alliance. MnTAP published and distributed approximately 10,000 catalogs to local sites, metropolitan counties, and the mailing list. The web site and database have become effective tools in conducting exchanges, tracking and measuring exchanges, and printing the catalog. Web user self-referrals have become a larger part of materials exchange activity, totaling over 4,000 in 2001 alone.

Metropolitan Airports Commission — MAC has an ongoing reuse program for discarded pallets that would otherwise be destined for disposal. They are generated by the various tenants, as well as by MAC operations. Numbering up to 1,000 per month, MAC maintenance personnel pick up pallets at loading docks, along roadways and ramp areas and bring them to a designated pallet staging area. Previously, pallets were ground into landscape mulch or animal bedding either on-site or off. Now, thanks to the Minnesota Materials Exchange, a partnership has been formed with a vendor who reuses them. Every week, and more often if needed, a flatbed truck arrives and takes away 160 pallets. The cost to MAC is zero, and the vendor has a steady supply of reusable pallets. Any damaged pallets are repaired or dismantled. Annually, more than 10,000 pallets are reused, and the avoided disposal cost easily exceeds $15,000.

MAC also promotes reuse internally through a policy of the purchasing department. A procedure has been established outlining the steps to take when MAC-owned property is no longer needed by a particular employee or department. Countless items have been kept out of the waste stream and reused in this manner.

Pollution Control Agency — At least twice a year (during Earth Week and the Holiday Season), staff organizes a “free garage sale.” Usable, but unwanted, items from staff are brought in and placed on a table for others to take and reuse.

Minnesota State Colleges and Universities

North Hennepin Community College — Used but serviceable computers and components have been given to other schools that expressed a need. Excess office equipment is given to other schools and also turned in to the state’s Materials Management Division for use elsewhere.

St. Cloud State University (SCSU) — Carpet and cardboard are recycled at SCSU; also lard and cooking oil. A local farmer’s hogs are fed leftover food.

University of Minnesota — The University Department of Environmental Health and Safety operates a chemical redistribution program (http://www.dehs.umn.edu/hwd/recycle) which finds users for

unwanted but usable chemicals within the university community. The program distributes about 1000 kilograms of chemicals per year that would otherwise be disposed of as hazardous waste.

The University Facilities Management Waste Management/Recycling operates a reuse program for redistribution of unwanted computers, office furniture and equipment, and laboratory furniture and equipment (http://www1.umn.edu/recycle/reuse.html) at a new location, the Hospital Distribution Center. The target audience is the university community , nonprofits and the general public. Available items are listed and often shown on their web page. A web-based program called the Virtual Warehouse lists and shows items available for sale/redistribution at their current locations. Items are marketed and exchanged without the extra handling and transportation required to take them to the central warehouse. The newest addition to the web site is a Bid Section where individuals can name their own price for unusual or collectible items.

22. Office Supplies

Department of Administration — The Division of State Building Construction specifies the purchase of soy-based inks for all writing instruments, if available. Also, the division purchases water soluble, non-toxic marking instruments, whenever available. Partnership between the Recycling Association of Minnesota and the Resource Recovery Office promoted reuse of ink jet printer cartridges by distributing free promotion kits and free return mailers to state offices.

The Resource Recovery Office encouraged waste reduction by promoting the *Office Waste Paper Reduction Kit* and *If Not You, Who?* materials at state meetings, events, and displays. The Resource Recovery Office and Materials Management Division use 100 percent post-consumer, processed-chlorine free paper for printing and copying. All Admin offices use copy paper that has at least a minimum 30 percent post-consumer content.

The Materials Management Division's Central Stores and S&T Office Products sold 2,265 recycled products in fiscal year 2000, up from 2,244 products in fiscal year 1999. Total sales of recycled products through May 2000 were $1,991,038, of which $1,743,755 were sales through Central Stores and $247,283 were sales through S&T Office Products.

In fiscal year 2000, Central Stores added nine House of DooLittle recycled products to their dated products contract. These products are made from 100 percent recycled paper containing 30 percent post-consumer waste, printed with soy-based inks, and covers on the books and planners are made from 50 percent recycled fiber. In the spring of 2000, Central Stores again offered these products for the year 2001 and added four At-a-Glance products that also contain 30 percent recycled content. These products were advertised in a six-page rollout flyer that was mailed to all their customers. The products are also advertised on the Central Stores' web site along with an easy-to-use order form.

In fiscal year 2000, a new 100 percent post-consumer paper was added to Central Stores' inventory. This paper is 100 percent recycled content, is acid-free for a long bright life, and has outstanding opacity for two-sided copying. It is manufactured in a totally chlorine-free process. This product exceeds all state and federal requirements for recycled content.

In May 2000, Central Stores rolled out their new e-catalog. This electronic online catalog reduces paper consumption by eliminating the need for a printed catalog and by allowing customers to order online for faster order placement without the need to fax or mail an actual order form. Because the catalog, with graphics, is available online, this will allow Central Stores to reduce the number of printed catalogs they need to order and distribute to their customers on a yearly basis.

The Materials Management Division has a contract for industrial paper with sales of approximately $2,200,000 for fiscal year 2000. Within that total, 89 percent of the sales were for recycled paper

towels and tissue that contain 90 to 95 percent post-consumer waste. This exceeds the federal standard of 40 percent. MMD also has a contract for printing and business papers with sales of approximately $1,700,000 for fiscal year 2000. Within this total, 75 percent of the purchases were for recycled paper. MMD's contract for recycled continuous printer paper had sales for fiscal year 2000 of approximately $27,354 for 30 percent post-consumer printer paper. This amount will increase by approximately $67,000 for next year, as the four largest volume corresponding products on the continuous printer paper contract will be deleted, shifting the business to the recycled paper contract. Agencies will be able to buy the same sizes in a recycled product at reduced prices.

The Risk Management Division continues to request soy-based ink for printing orders, and recycles printer and typewriter toner cartridges. The InterTechnologies Group refills small spray bottles with glass/desk cleaner from gallon containers to avoid the use of aerosol cans and uses recycled laser printer cartridges.

Department of Commerce — Printer and copy paper used by the department contains 30 percent post-consumer content by fiber weight.

Department of Corrections

MCF-OPH — Laser cartridges are recycled and toner cartridges are sent back to the manufacturer. A recycler for Ink Jet printer cartridges was recently located. Telephone books have been sent to a sheltered workshop for use in their activities, or are otherwise recycled.
As a matter of practice, OPH purchases office supplies, particularly paper products, which are recycled or post-consumer recycled product. The state's Resource Recovery Program is used to recycle mixed paper, plastic, cans, and corrugated cardboard. White office paper is forwarded under the Resource Recovery Program to Rock Ten where it is recycled into other paper products. The OPH transport costs for the joint recycling program with MCF-STW are $2,500.
MCF-RC — RC uses Shred-It Recycling for most of its paper products. The used toner cartridges are sent back to the manufacturer for recycling.
MCF-SCL — SCL uses Shred-It Recycling for a large portion of office products, at a cost of $13,200, but it provides cost savings for landfilling and saves 480 trees annually. The facility plans to continue its recycling efforts.

Office of Environmental Assistance — The OEA uses Savin IKON copier machines, which have non-removable toner cartridges that are made of high-density polyethylene plastic.

The OEA switched from 30 percent post-consumer recycled copy paper processed with chlorine to 100 percent post-consumer copy paper processed without chlorine. Just over half of the supplies purchased are reusable or contain recycled content. Examples include post-it-notes, refillable pens and pencils, file folders, 3-ring binders, note pads, etc.

Recycled paper is used exclusively in the office, whenever it is available. Letterhead and envelopes contain 100 percent post-consumer recycled paper content. The OEA continues to use water-based correction fluid instead of solvent-based fluid. OEA computers are cleaned with pressurized carbon dioxide instead of chlorofluorocarbons. OEA audio, video, and digital tapes are reused, as well as computer discs.

For all internal meetings, staff specifies and purchases lunches and break food and beverages from vendors who offer low- or no-waste packaging and reusable dishware. This reduces waste and supply costs. The OEA and PCA cafeteria supplies compostable dishware. The OEA uses washable linens in its kitchen and in restrooms.

Metropolitan Airports Commission — Whenever possible, products made from recycled materials are purchased and used. Printer toner cartridges are returned to the manufacturer for remanufacturing.

Remanufactured cartridges are being evaluated for use in office equipment and after a test period, if found effective, will be used exclusively, thereby "closing the loop." Recycled content paper is used in the copy machines and printers.

Metropolitan Council - Environmental Services — Office supplies, particularly paper goods, are frequently purchased with recycled and post-consumer recycled content material. Laser toner cartridges for personal computer printers are collected and sent to a vendor where they are prepared for reuse at MCES. Used ink jet cartridges are sent to EnviroSmart in Franklin, Tennessee for recycling. These are mailed individually and directly in plastic, postage-paid envelopes.

Metropolitan Mosquito Control District — The district purchases office paper with a minimum 25 percent post-consumer fiber content for printers and copy machines. Reconditioned, re-inked laser printer cartridges and recycled inkjet cartridges are purchased and used whenever possible. However, the district has found that the performance and poor print quality of recycled printer cartridges does not approach that of new printer cartridges. Used laser printer cartridges are collected and returned to office supply vendors for reconditioning whenever possible. As the technology for print devices improves, hopefully the quality of recycled cartridges will also improve.

Pollution Control Agency — The central office uses reusable visitor badges. The many advantages to reusable badges are that they waste less paper, provide improved security, are easily distinguishable, and do not damage clothing. In August 1999, the state's Central Stores added a 100 percent post-consumer paper product, distributed by Badger, to the State of Minnesota contract. Purchasing staff was directed to order this paper for a majority of the agency's printing needs. The paper has been working well in fax machines and photocopiers; however, there have been problems with paper jams in many laser printers. Therefore, staff has been instructed to order 50 percent post-consumer paper, distributed by Great White, for laser printers that cannot accommodate the 100 percent post-consumer paper.

Efforts to reuse existing supplies whenever possible continue. Each floor has a designated storage area for reusable items such as file folders, 3-ring binders, and a variety of miscellaneous office accessories. MAPS users are encouraged to purchase writing tablets that contain the highest percentage of post-consumer content material from the Central Store state contract. The MPCA recycled 86,411 pounds of office paper, 221 pounds of confidential paper, and 9,723 pounds of corrugated cardboard. The MPCA Waste Reduction and Recycling Committee (WRRC) continued to sponsor pad-making parties with staff who volunteer to make one-sided paper pads with experienced paper over their lunch hours. This event is typically scheduled once a month. Each MPCA staff member received a one-sided paper tablet courtesy of WRRC in May 1999.

Minnesota State Colleges and Universities

Bemidji State University — The University continues to purchase copy machine paper with at least 30 percent recycled content for use in all campus copy machines. This policy results in a somewhat higher cost ($1500-$1700/yr). An environmental benefit should be realized through the reduction of the environmental impacts associated with the manufacture of virgin paper. Double-sided copying is encouraged throughout campus.

North Hennepin Community College — Central Services provides a summary of their supply purchases on a quarterly basis to all departments on campus. This allows departments to keep tabs on their usage and helps discourage waste.

St. Cloud State University (SCSU) — SCSU extensively uses paper with 30 percent-recycled content and 30 percent post-consumer fiber content. Office and computer paper is recycled. Recycled photocopier toner cartridges are purchased. Ink and toner cartridges are recycled. SCSU encourages using e-mail to post surplus supplies for use in other departments.

23. Oil, Oil Filters

Department of Administration — The Materials Management Division has established statewide contracts for the purchase of re-refined motor oil and oil change services that include re-refined oil as a choice. Re-refined motor oil and changing services purchased through state contracts contain a minimum of 25 percent re-refined base oil, and also contain the required additives to provide optimal engine performance. The oil change services contract had over $75,000 worth of re-refined oil changes. The Materials Management Division has a contract for bulk re-refined motor oil.

The Travel Management and Plant Management divisions' oil filters are drained for 24 hours in order to qualify as solid waste, as opposed to hazardous waste. Re-refined oil is also used for oil-changes. The division also uses a 100-percent re-refined brand of engine oil when servicing vehicles. A vendor licensed under state contract collects the used oil for recycling.

The Plant Management Division participates in a used oil recycling program. The Materials Management Division, in conjunction with the Department of Transportation has a contract for the management of used oil sorbents and filters for processing for energy recovery.

Department of Corrections — See also section 8 *Batteries* in Part 3.

MCF-LL — LL recycles oil and oil filters.

MCF-OPH — Approximately 50 gallons per year of used oil and 25 gallons of recyclable refrigerant oil is picked up and recycled by a local vendor. Groundskeeping equipment oil filters were recycled this year after finally accumulating sufficient quantity. Automotive oil filters are recycled by Rapid Oil when the oil is changed in the Transportation Unit vehicles.

MCF-ML — All waste oil and oil filters are collected and recycled.

MCF-RC — All automotive oil and filters are recycled through the local vendor that services RC's fleet. The oil use in the chillers is recycled through a vendor who contracts with the facility.

MCF-SCL — All facility vehicles are serviced at local service stations that recycle the oil and filters. The cost is $3,600. The facility's oil is not disposed of in a landfill, and there is no ground contamination. SCL plans to continue using a service station.

MCF-SHK — Oil and filters are recycled through Safety Kleen.

MCF-STW — Oil and oil filters are used in most of the MCF-STW vehicles and machines. They are recycled for reuse when possible, and any waste is disposed of in accordance with EPA/MPCA regulations.

Metropolitan Airports Commission — MAC fleet/vehicle maintenance shop is equipped with an oil/fluid change pit that employs a mobile collection tray to catch spent lubricants. It is pumped directly to a large storage tank with little or no chance of spilling. Oil filters are crushed on-site and recycled by the same permitted vendor that removes the used oil for re-refining. Overhead service reels provide oils and grease through hoses connected to bulk storage tanks, eliminating the need to pump liquids from drums into containers and then carrying them to the service bay only to be dispensed again. Spills are rare and absorbent use is minimal.

MAC also recognizes that there is a need to collect used oil from non-commercial tenants at the reliever airports. Collecting used oil from these tenants reduces the chances of possible ground water and soil contamination from the oil being improperly managed (dumped on the ground or in a dumpster). Used oil generated at the reliever airports by non-commercial tenants and MAC operations

is stored in tanks provided by MAC. It is collected periodically by a permitted vendor who then re-refines it.

Metropolitan Council – Environmental Services — Used oil and used oil filters are handled as special hazardous wastes. The used oil is collected and stored at MCES facilities and is transported by licensed haulers for burning as fuel. Used oil filters are drained and, at the larger facilities, crushed. The residual oil is collected, and the crushed metal filters are eventually recycled with scrap iron and steel by a licensed hauler such as OSI Environmental, Inc. In 2000, for all facilities, 5,433 gallons of used oil were transported, a reduction of 20 percent from 1999. Approximately 2,100 pounds of used oil filters were recycled, the same volume as the previous year.

Metropolitan Council – Transit Operations — All used oil and oil filters are recycled. Used oil has been sold as a fuel since 1985. Used oil filters have been eliminated from the waste stream and recycled since 1993.

Metropolitan Mosquito Control District — Used oil and used oil filters are recovered and recycled through a recovery vendor. Re-refined oil is being used in the district's light duty vehicles to help create a market for re-refined products. MMCD continues to follow a fleet maintenance procedure of extending the mileage between oil changes for district owned vehicles. Currently oil changes are every 5,000 miles for light duty vehicles which is most of the fleet, and 3,000 miles for heavy use vehicles. This fleet maintenance procedure has been in effect for a number of years. There has been an annual 35 percent reduction in the amount of used oil generated by MMCD's fleet, which translates into a 110 gallon reduction in used oil. MMCD has not experienced any problems with the truck fleet related to the extended mileage program.

Minnesota State Colleges and Universities

North Hennepin Community College — The college stores used oil and filters in approved containers, and recycles them through a local recycling vendor.

St. Cloud State University (SCSU) — SCSU oil filters are drained for over 24 hours to qualify as special hazardous waste; motor oil is collected and recycled.

Department of Transportation — Mn/DOT recycles all used oil and oil filters.

University of Minnesota — The University of Minnesota collects its used oil and oil filters for energy recovery and materials reclamation.

24. Paints, Coatings, Stripping

Department of Administration — The Materials Management Division specifies no-lead paint for traffic marking and equipment paint. The MMD and the Office of Environmental Assistance have developed a contract for recycled paint. Volunteers are currently being sought to participate in the recycled paint pilot project, which will test the efficacy of using and procuring recycled paint. The contract becomes effective July 2000.

The Plant Management Division makes solvent-free paint available to state agencies and political subdivisions through its state contract. The division also tests the use of latex-based duct sealant compounds and uses nut chips with shot-peening equipment to remove paint and gasket materials.

Department of Corrections

MCF-OPH — Latex paint products are used wherever possible. Oil-based paints are used only in those locations with heavy use. Paint residue and waste is disposed of through the facility's hazardous waste hauler and incinerated by the hazardous waste vendor. MCF-OPH is a VSQG, generating only about 100 gallons of paint and printing waste each year.

MCF-RC — RC has set up a contract with Onyx Environmental for all hazardous waste disposal.

MCF-SCL — Painting, coating, and stripping sludge are collected and reduced properly. The cost is $2,000 annually, and it keeps hazardous products out of the landfill and ditches. SCL plans to continue recycling efforts.

MCF-SHK — The facility recycles through Aptus. The facility uses all the paint and coatings purchased, and recycles the mineral oil spirits used for cleaning brushes.

MCF-STW — Paints and coatings are used at the MCF-STW. Stripping is not done at this facility. The waste is disposed of in accordance with EPA/MPCA regulations.

Department of Human Services — Moose Lake has eliminated solvent-based paints and finishes in its woodworking shop.

Metropolitan Airports Commission — MAC Paint Department is responsible for painting/striping acres upon acres of pavement, runways and taxiways in addition to parking lots and roads. The 15,000+ gallons of pavement-marking paint used annually is purchased in reusable 250-gallon totes. Once emptied, the totes are returned to the supplier for reuse, eliminating the need to manage 275 single-use, 55-gallon steel drums.

Most interior painting and all exterior painting for buildings and pavement is done with solvent-free, water-based paint. Any use of solvent-based paint is restricted to the paint booth. The paint booth uses water filtration in addition to standard paint booth filters, which actually makes the exhaust cleaner than the air taken in. Paint booth filters are managed as nonhazardous industrial waste and are burned for energy recovery. Exclusive use of high volume low pressure (HVLP) spray technology for solvent-based paints reduces overspray by 40 percent, uses less paint, and more evenly coats for a better finished product. Sandblasting has been replaced by shotblasting with a self-recycling system that filters and reuses the blasting media.

Metropolitan Council – Environmental Services — The Paint Shop at the metro WWTP continues in its relevant ongoing P2 activities such as direct-to-metal, water-based paints and epoxies which eliminate the use of approximately 1,000 gallons of solvent-based primer and 100 gallons of paint thinner each year. Used polystyrene paint arrestors are dissolved in waste thinner, thereby eliminating one hazardous waste stream entirely.

The Paint Shop received a Special Recognition award from the MN GREAT! program in 1995 for these and other activities which save an estimated at $26,000 annually.

Pollution Control Agency — The new Brainerd office features low VOC paint and finishes, high recycled-content resilient carpeting and flooring, and recycled-content or recycled Styrofoam ceiling tiles.

Minnesota State Colleges and Universities

Bemidji State University — BSU maintenance procedures still include the use of electrostatic painting and low VOC paint whenever possible. The use of organic solvent-based wood sealers has been discontinued. A water based product is now used.

North Hennepin Community College — Minimal painting is done on site by in-house staff. The small quantities of paint/coatings kept on site are used for touch-ups and dried out and discarded when all of product is used up. The services of a local contractor are used for area painting.

St. Cloud State University (SCSU) — SCSU has converted all possible coatings to water-based products to limit VOCs, including paint, varnish and traffic stripping paints.

Department of Transportation — Several Mn/DOT districts are using 110-gallon returnable paint totes instead of 55-gallon single use drums. This eliminated waste 55-gallon paint drums. Mn/DOT uses lead-free latex or epoxy pavement marking/striping paint. This eliminated an entire hazardous waste stream (lead, chrome, and toluene) generated during pavement marking and striping operations. All vehicles purchased by Mn/DOT are specified to have heavy metal free coatings/paints. See section 16 *Heavy metals*.

University of Minnesota — The university's updated Standards and Procedures for Construction recommends and supports the use of reblended paint (http://www.facm.umn.edu/cons/DIVpdf/Div9a.pdf) and has developed reblended paint specifications (http://www.facm.umn.edu/cons/APPpdf/O_APPA.pdf).

In 1999 as a result of a collaborative decision by university officials and a host of other agencies, the interior walls of the new $35 million University Gateway center were coated with used paint. The project was part of a green building initiative spawned by the Minnesota Office of Environmental Assistance, the university's Waste Abatement Committee, Hirshfield's Painting Mfg., and the Minnesota Painting and Wallpapering Employers Association.

A one-day paint drive collected more than 1,000 gallons of different color, gloss and quality paints from members of the Minnesota Painting and Wallpapering Employers Association. The paint was inspected, mixed and tested by Hirshfield's Painting Mfg. Approximately 2000 gallons of recycled paint were used to coat a majority of the Gateway interior walls. The only areas exempt from the paint are ceilings and doorframes, which require a different product.

Though recycled paint is not new to Minnesota, the Gateway venture signifies the largest commercial use of recycled paint thus far in the state. The Gateway project illustrates to the university and greater community that recycled paint isn't just a raw concept but a quality alternative to virgin paint. From an application standpoint, it demonstrates that it's an industry-grade paint that can be purchased by contractors and used effectively.

25. Parts Cleaning

Department of Administration — The Plant Management Division shares used cleaning solvent with the Travel Management Division to be reconditioned for future use. The Travel Management Division has an aqueous-based parts cleaner machine. No hazardous waste is generated from this system. TMD also has an OSHA approved brake cleaning system to handle any possible asbestos contact or contamination.

Department of Corrections

MCF-OPH — A recyclable parts cleaning process is used.

MCF-SCL — The parts cleaner has been eliminated from the facility.

MCF-SHK — SHK recycles through Safety-Kleen Corp.

MCF-STW — There are two types of parts cleaning operations performed at the MCF-STW. Paint equipment is cleaned with xylene. This is recycled in-house and the still bottoms are disposed of in accordance with the EPA/MPCA regulations. Maintenance parts cleaning is done in the various shops. The waste is fuel-blended in accordance with the EPA/MPCA regulations by the state contract vendor.

Metropolitan Airports Commission — This program continues to be managed by a solvent parts washing vendor. The size and number of solvent parts cleaners has been minimized and service intervals have been maximized to produce as little waste as possible while at the same time maintaining efficiency in the shop.

The maintenance shop is currently evaluating two solvent parts washers equipped with an internal distillation apparatus that promises to reduce, if not eliminate, the hazardous waste generated from parts washing. If the trial proves successful, all parts washers may be converted. MAC operates two spray cabinet parts washers that use a heated, water-based cleaning solution at high pressure. An auxiliary filtration system extends solution life. Spent solution is nonhazardous and is recycled. MAC's goal is to reduce and eventually eliminate the use of solvents for parts cleaning.

Metropolitan Council – Environmental Services — There are over two dozen parts washers at MCES facilities and 437 gallons of solvent were recycled in 2000, a reduction of 40 percent from the previous year. The solvent is petroleum-based and is serviced by Safety-Kleen, Inc. as a hazardous waste largely due to its low flash point. To date, various experiments with alternative, nonhazardous solvents, have not met with widespread user and regulatory acceptance. However, one facility, after review of its operational needs, discontinued use of the parts washer altogether. Trials with other parts cleaning options will continue. Carburetor cleaner is no longer in widespread use due to the increase in vehicles that are now fuel injected.

Minnesota State Colleges and Universities

St. Cloud State University (SCSU) — SCSU has experimented with more environmentally friendly brake cleaner and parts washer fluids in the auto repair shop. The Art department and print shop use a solvent recycling service, which provides them pollution prevention We Care® training.

Department of Transportation — Mn/DOT has replaced non-recyclable vehicle parts washers with aqueous based vehicle parts washers and high flashpoint petroleum vehicle parts washers. The vehicle parts washers are retrofitted with filtration systems so the product can be used over and over again. These recyclable parts washers can go three to five years without a change out, compared to every two weeks to a month with the old non-recyclable parts washer. See section 30 *Procurement.*

University of Minnesota — The University of Minnesota has an ongoing program of using parts cleaning services, such as Safety Kleen, that recycle the dirty solvent. Evaluation of more environmentally friendly parts cleaning products is ongoing in individual shops.

U of M-Duluth Facilities Management switched from a solvent recycling service to a product (ZEP Z-143) that is non-flammable and is perpetually cleaned by a recirculating filter system. Filters periodically need to be disposed of, but the solvent does not need to be shipped off-site for recycling/disposal. They have been able to eliminate 120 gallons of solvent waste per year.

26. Personal Care

Department of Human Services — St. Peter uses washable diapers instead of disposable.

27. Pesticides, Fertilizers

Department of Administration — The Resource Recovery Office evaluated integrated pest management practices at the State Recycling Center and reduced its usage of vender services.

The Materials Management Division is changing its pest control services by moving to integrated pest management—a process to achieve long-term, environmentally sound pest suppression and prevention through the use of a wide variety of technological and management practices.

The Plant Management Division follows pollution prevention practices during the planting and care of landscaping by its Grounds Services staff, and participates in a Public Land Task Force addressing integrated pest management practices.

Department of Agriculture — The Agronomy /Plant Protection Division has ongoing projects that are instrumental in educating rural, suburban, and urban Minnesota in the proper best management practices of pesticide use and disposal. The Agronomy/Plant Protection Division's participation in the WaterShed Partners, a coalition of 36 public, private, and nonprofit organizations, is instrumental in educational programs to reduce urban runoff in the metropolitan area.

The ongoing empty pesticide container and pesticide waste programs within the Agronomy/Plant Protection Division have educated many rural farmers on the best use and proper disposal of pesticides. The Sustainable Agriculture program, now in its 13th year, continues to help farmers learn alternative practices to pesticide application. A copy of this year's *Greenbook* can be obtained from the Minnesota Department of Agriculture. The Agronomy Plant Protection information can also be obtained from the Minnesota Department of Agriculture's web page: www.mda.state.mn.us.

Department of Corrections — Most facilities buy only the amount of pesticides needed and that can be used within the season to eliminate need to store between seasons and possible pollution through spillage. At least one groundskeeper in each facility is a licensed pesticide applicator. A state contract is provided for pesticide application within each facility for insects, etc.

Department of Human Services — St. Peter continues to use half of the manufacturer's recommended amount of pesticides and fertilizers on its campus.

Metropolitan Mosquito Control District — MMCD is committed to using pesticides for the control of mosquitoes and black flies that have the highest safety characteristics for MMCD staff, have low environmental impact, and show selectivity for target species. Evaluation of control materials has shown that the pesticides selected by MMCD for use in controlling pest insects do not display any hazardous characteristics regarding employee safety and environmental impact. The materials used by MMCD to control larval mosquitoes in wetland areas and black fly larvae in the rivers and streams are safe enough to be used in fish bearing waters. Additionally MMCD employees must go through several training sessions that focus on the proper use, transport, and handling of all the pesticides used by MMCD. Employees who use materials for the control of adult mosquitoes must attend training sessions given by the Minnesota Department of Agriculture, they must also pass an exam and be licensed in order to use these control materials.

By selecting control materials that rate high in environmental compatibility, MMCD has reduced the risk of environmental pollution and has eliminated significant costs associated with storing, transporting, and disposing of materials as hazardous wastes.

Minnesota State Colleges and Universities

North Hennepin Community College — All herbicides, pesticides, and fertilizer are applied by licensed private contractors.

Department of Transportation — Mn/DOT uses tons of animal manure annually as a nutrient source in the compost treatment of petroleum contaminated soils. After these soils have been treated, the soil is used as a topsoil amendment along Mn/DOT right-of-way. (See section 32 *Tanks.)* Mn/DOT is researching biological control of various weeds as an alternative to herbicides used on roadside vegetation. Flea beetles are being used to control leafy spurge in the Twin Cities metropolitan area. Biological control will hopefully reduce or eliminate the use of some herbicides.

Mn/DOT is researching state-of-the-art pesticide application machinery and pesticide formulations on Mn/DOT right-of-ways. This research project will meld cutting-edge pesticide application technology with advanced pesticide formulations to determine how Mn/DOT can more accurately deliver herbicides to target weeds and obtain better control over longer periods of time. This will reduce the number of applications needed each season.

University of Minnesota — The University of Minnesota is a world leader in agriculture research and education, which includes extensive efforts in the development of and safe and environment friendly use of pesticides and fertilizers. Special areas of expertise are integrated pest management (http://www.ipmworld.umn.edu) and sustainable agriculture (http://www.misa.umn.edu).

The university's College of Agriculture, Food and Environmental Sciences (http://www.coafes.umn.edu/), Extension Services (http://www.extension.umn.edu/), and Biosystems and Agricultural Engineering (http://www.bae.umn.edu/) are major providers of training, research, and outreach services to Minnesota and the world in these areas.

28. Policy Statement

Department of Administration — State Resource Recovery Program goals for fiscal year 2001-2002 are adopted from the State Resource Recovery Program Recommendations Report. The Office of Environmental Assistance and the Department of Commerce submitted this report to Admin in accordance with Minn. Stat. §115A.15, Subd. 5(b). Goals encompass waste and toxicity reduction, materials reuse, recycling efforts, environmental criteria incorporation into state contracts, waste reduction and environmental purchasing training, environmental purchasing tracking and evaluation, and green building technique usage in construction and remodeling. Admin looks forward to collaborating through its current partnerships and to fostering new relationships to implement the State Resource Recovery Program goals. Admin's environmental partnerships will guide government's increasing efficiency and progress toward a more sustainable Minnesota.

The Department of Administration's recycling promotion will continue to include environmental procurement networking, coordination with customers, purchaser training, certification and recertification, progress tracking, and analysis for program improvement. The partnerships developed in the Material Management Division's Environmentally Responsible Work Group, Procurement Coordinators Group, and contract user groups, provide valuable guidance to achieve new levels of environmental purchasing and recycling. Training state agency purchasers about recycled-content products will help consumers obtain products and sustain the recycling loop. State progress in both measuring and increasing the use of recycled-content products will provide further accountability in the environmental purchasing practices of public entities.

Department of Agriculture — In compliance with Executive Order 99-4, pollution prevention is a priority for the Minnesota Department of Agriculture. The department's objective is to undertake activities to reduce the generation of hazardous waste and use of toxic solvents and pesticides. The primary goal is to prevent pollution at its source and to reduce waste and emissions that can have an adverse impact on the environment.

Department of Commerce — The department considers protection of the environment to be a high priority. We provide leadership in developing, advocating, and implementing equitable, cost-effective policies regarding departmental agendas. In the area of energy policy, protection of the environment through reduction of pollution associated with traditional energy sources is a major goal of the department. The Department of Commerce is committed to leading, by example, through the reduction of energy use, use of toxic pollutants, and generation of hazardous waste in our own department.

Department of Corrections — DOC Policy 105.150 Right to Know Program and DOC Instruction 300.400GOPH.

DOC POLICY – Right to Know Program

Number: 105.150
Issue Date: 10/15/99
Effective Date: 1/1/00
Page: 11 of 11

1. Regardless of size or contents of the spill, staff will employ all precautionary means (appropriate personal protective gear will be used by anyone participating in this exercise). The facility safety officer(s), A-team Officer in Charge, and the Watch Commander will determine whether an evacuation is necessary or if a "defend in place" action is sufficient.
2. The hazardous waste generator licensee is responsible for maintaining the contingency plan for facilities required to have a contingency plan by the Minnesota Pollution Control Agency.
3. A copy of the program will be made available upon request to employees and their representatives.

Review:	Annually
References:	Minn. Statute 151; Minn. Rule 5206; OSHA Standard 1910.1200(g); ACA Standards 2-CO-3B-01, 3-4203 and 3-JTS-3B-05.
Supersession:	Department Policy 105.150, "Hazard Communication" 11/16//98. All facility policies, memos, or other communication whether verbal, written or transmitted by electronic means regarding this topic.
Attachments:	Non-Routine Tasks form Control Log for Issuing Chemicals

Office of Environmental Assistance — Pollution prevention means eliminating or reducing pollution at its source. This includes using raw materials and other resources more efficiently, substituting benign substances for hazardous ones, and producing products without toxic constituents. P2 helps to protect human health, strengthen the economy, and preserve the environment. The Office of Environmental Assistance (OEA) gives priority consideration to pollution prevention in its programs and activities as required by Governor's Executive Order 91-17. The OEA is committed to excellence and leadership in preventing waste and pollution and strives to be a model for other agencies and organizations. The OEA believes that pollution prevention in its workplace will lead to healthier and more efficient employees, saving of public funds, and less waste introduced into the environment.

The OEA stresses the preventive approach as the preferred approach for environmental protection in its policy-making activities. In reports, testimony, and strategic planning, the OEA staff will promote pollution prevention as the top of the environmental protection hierarchy.

Each member of the OEA staff is responsible for preventing pollution by reducing their own waste generation at work. Specifically, staff is directed to give consideration and preference to pollution prevention options when purchasing supplies and equipment, traveling to meetings, using equipment in

the office, photocopying documents, and in ordering office furniture. The OEA will demonstrate cost-effective alternatives that reduce all environmental impacts in its office and lease agreements. It will also work cooperatively with other tenants to promote the prevention approach building-wide.

The OEA will also build partnerships with all stakeholders to promote the preventive approach to environmental protection. These stakeholders include other state agencies, local governments, businesses and business groups, schools and higher educational institutions, financial and economic development institutions, nonprofit organizations, and citizens.

In order to pursue and monitor this pollution prevention policy and as part of the OEA's participation in Minnesota Waste Wise, a coordinating team with representatives from each unit is established that will meet regularly to discuss and stimulate the increased implementation of pollution prevention activities at the OEA. This team will measure the effectiveness of its efforts and will meet with the OEA director at least quarterly for updates about the OEA's progress.

Metropolitan Airports Commission — The Metropolitan Airports Commission (MAC) recognizes pollution prevention as an integral part of its services. MAC's strategic plan reflects its commitment to environmental protection. MAC is committed to providing excellence and leadership in protection of the environment. In keeping with this position, the commission's objective is to reduce waste and emissions. MAC strives to establish sound environmental strategies that lessen adverse environmental impacts on the natural environment and the surrounding communities. MAC encourages its tenants to do the same. MAC promotes taking a proactive approach to environmental protection and supports cooperation with other regulatory agencies. MAC is aware that meeting this commitment will require the cooperative efforts of its entire staff and tenants. (See also Part 2—Policy/Regulatory Activities.)

Metropolitan Council – Environmental Services — The Metropolitan Council's Administrative Policies and Procedures, Section 1-2a, is titled Environmental Sustainability. This section contains a sub-section with policies that are consistent with the Governor's Executive Order 99-4.

Metropolitan Council – Transit Operations — The Metropolitan Council has a general Environmental Sustainability Policy (Section1-2) which addresses issues relevant to the entire region. The companion Environmental Sustainability Procedure (Section 1-2a) covers pollution prevention for council staff. Transit does not have any regulatory activities.

Metropolitan Mosquito Control District — The Metropolitan Mosquito Control District is committed to protecting the environment. It is the policy of the district to significantly reduce and, whenever possible, eliminate the release of toxic pollutants and the generation of hazardous and other wastes.

By successfully preventing pollution at its source, the district can improve the quality of the environment and maintain a safe healthy workplace for its employees. Environmental protection is everyone's responsibility. The MMCD is committed to being a good neighbor and to operating in strict compliance with federal, state, and local environmental laws. Meeting this commitment requires the cooperative effort of all MMCD employees. Technologies and methods that substitute nonhazardous materials and use other source reduction approaches will be given top priority for integration into MMCD operations.

Minnesota State Colleges and Universities

North Hennepin Community College — North Hennepin Community College strives to do its part in protecting the environment through conscientious use of supplies, materials, and equipment. NHCC recycles and reuses whenever possible, in order to make full use of the valuable resources that went into making these products.

Department of Transportation — See Part 2 *Policy and Regulatory Activities.*

University of Minnesota — See Part 2 *Policy and Regulatory Activities.*

29. Printing

Department of Administration — The Resource Recovery Office's electronic paper waste reduction initiative includes electronic correspondence and reporting activities such as promoting the use of e-mail messages instead of faxes where feasible, investigating the use of electronic signatures to reduce the use of faxes and photocopying; and measuring progress in and promoting recycling, as required by statute. The office saved about 4 reams of paper through the use of e-mail to state agencies, avoiding faxes, printers and copiers.

The Plant Management and the Materials Management Divisions purchased double-sided printers to facilitate paper waste reduction.

The Materials Management Division continues to require post-consumer recycled paper content on all printed material paper to be at least 30 percent. In addition, the Materials Management Division includes the following statement in all solicitations for printing:

> Environmental Health and Safety Requirements:
>
> By responding to this bid, the company certifies that it is in compliance with applicable state and federal laws related to environmental health and safety. If you have any questions, you should contact the Minnesota Technical Assistance Program (651.627.1910 or 800.247.0015). They can also provide a compliance checklist, which outlines federal, state, and local environmental regulations affecting printers in Minnesota.

The Materials Management Division processes several Best-Value bid solicitations, using environmental requirements as part of the evaluation criteria, which is an advantage for the Great Printers Projects. Communications Media, which participates in the Great Printers Project, offers customers *Launch!* software that allows them to send electronic files (a 1997 Minnesota Great! award-winning project). In addition, Communications Media uses equipment to reduce waste including a water flow meter to reduce water use at PrintComm and silver waste recovery equipment in processing areas at both PrintComm and DocuComm. Communications Media has a goal to complete experimentation of no-VOC replacements for litho wash and deglazer.

The Minnesota Office of Citizenship and Volunteer Services continues to use soy-based inks for all its stationery, brochures, and other publications. The Resource Recovery Office and Materials Management Division use 100 percent post-consumer, processed-chlorine free paper for printing and copying. All Admin offices use copy paper that has at least a minimum 30 percent post-consumer content. In order to reduce printing and waste, the Resource Recovery Program Biennial Report is posted on Admin's Internet page http://www.admin.state.mn.us/resource_recovery.html.

Department of Commerce — The department uses printer and copy paper which contains 30 percent post-consumer content by fiber weight. Over 2 million sheets of paper are used by the department each year. Efforts will be made in the next year to encourage responsible printing practices and double-sided photocopying.

Department of Corrections

MCF-OPH — Industry's printing program consists of lettering on vinyl. Ink use is rigidly monitored and a record is kept of the inks used. Additionally the number and quantities of ink kept on hand and used in Industry has been consolidated into fewer varieties, saving purchase costs as well as disposal costs.

MCF-SCL — SCL's print shop personnel recycle and minimize the use of paper products. In addition to using less paper products, the facility prints with soy ink, which is more environmentally friendly. SCL plans to continue using soy ink and less paper products.

Office of Environmental Assistance — As part of its internal practices, the OEA uses recycled uncoated paper containing at least 20 percent and usually 100 percent post-consumer fiber. Whenever possible, the OEA chooses paper stock manufactured using no chlorine or chlorine derivatives and specifies soy-based ink for all printing jobs.

Metropolitan Airports Commission — MAC continues to use printing companies that use soy-based inks and recycled content paper for items such as official letterhead, etc.

Metropolitan Mosquito Control District — During the past fiscal year, MMCD sent brochures containing information on how to become a Minnesota Great Printer to the commercial printers used by MMCD. MMCD intends to specifically target Minnesota Great Printers for future commercial printing projects.

Pollution Control Agency — MPCA support staff print business cards on color printers or standard laser printers with black ink versus buying a box of 500 cards from the state contract vendor each time a staff person changes their position or job title. This option reduces the use of paper and saves the agency a significant amount of money. The agency's four OCE photocopiers continue to be serviceable. Since the OCE machines have been networked to the PCs of key users, savings have resulted from lower overage charges and from reducing the amount of paper used by forwarding print jobs directly to the copier. This new technology saves paper through two-sided printing and fewer jam occurrences.

Minnesota State Colleges and Universities

North Hennepin Community College — While some of our copying is performed on departmental photo copy machines with recycling bins located nearby for copy errors disposal. NHCC's duplicating section runs off most of the tests, quizzes, handouts, etc. needed on campus, using larger photocopying machines that are more cost efficient. Whenever possible copying error sheets are recycled as note pads. Large printing jobs are sent off-site to commercial vendors.

St. Cloud State University (SCSU) — SCSU recycles books, directories and newsprint.

Department of Transportation — Mn/DOT's sign shop uses lead-free ink and nonhazardous screen wash.

University of Minnesota — The University of Minnesota Printing Services recently joined Minnesota Waste Wise and will have a plant audit in September 2001. Printing Services met with Dana Donatucci, University Solid Waste Recycling Coordinator, to review current recycling practices to see if there is any more they can do. As a result of this meeting, Printing Services will be putting recycling tips in their monthly newsletter, will place more recycling bins throughout the office and plant, will evaluate the use of 20# recycled-content paper instead of virgin stock in copy centers, and will reduce the number of additional sheets ordered to set up print jobs.

Printing Services has recently installed a computer to plate system, which eliminates film and film-processing chemicals. Printing Services will continue to use some film but where they used to use up to 24 rolls a month they will now use one roll. Printing Services has also installed a new six-color press with automated features that will reduce the number of press set-up sheets on a job. Because the machine is new, they have not collected data on the savings.

Printing Services continues to use a Devek system that allows recycling and reuse of developer in film processing, using the developer four times instead of once as in the past. They also employ an X Rite silver recovery machine which recovers approximately 28 pounds of silver annually from photo fixer.

The University Financial Aid Office e-system saves 1 million sheets of paper. The Financial Aid Office was also one of the first in the nation to invest in an electronic financial aid system to replace its traditional paper-based system. On its first year, the electronic system achieved an 87 percent user rate, the average financial aid application processing time was reduced from six weeks to four days, the projected elimination of one million sheets of paper, and a cost savings of $80,000.

30. Procurement

Department of Administration — The Materials Management Division has numerous contracts that represent efforts to encourage sustainability in state government's daily activities. These contracts include hazardous waste management, pesticide collection, hazardous spill emergency response, used oil sorbent and filter management, fluorescent and HID lamp recycling, dairy (mercury) manometer management, and waste paper sales.

The Materials Management Division requires an environmental report by all certified purchasers. Each quarter they are required to report to MMD all environmentally preferable products purchased. MMD has developed environmentally responsible products and services contracts estimated in excess of $52 million per year.

MMD is collaborating with the Environmental Protection Agency and its Environmentally Preferred Products (EPP) work group to find and establish a mechanism for selecting EPP products. The EPP work group is established as part the Environmental Protection Agency/American Hospital Association Memorandum of Understanding, the goal of which is to virtually eliminate mercury from healthcare by 2005 and to reduce medical waste from healthcare by 50 percent by the year 2010.

The Materials Management Division, in conjunction with the Office of Environmental Assistance has developed a contract for carpet and vinyl flooring with products containing post-consumer recycled content. The contractor is directed to not dispose of removed carpet and vinyl in landfills or by incineration. Contractors have been strongly encouraged to recycle all carpet and vinyl flooring removed from the agency locations.

Department of Agriculture — The Laboratory Services Division continues to use 20 liter nowpack containers for methylene chloride, which has helped in the reduction of glass waste and the release of fumes into the laboratory. Whenever possible, vendors are requested to remove or eliminate excessive shipping materials when deliveries are made. This will help in reducing the amount of waste material placed in local landfills.

Department of Corrections — Most facilities follow Minnesota Statute 16B.121 and 16B.122, along with Minnesota Executive Order 99-4 requirements via their purchasing departments. This practice will eliminate and reduce the facility's waste stream through identifying and reusing recycled products. Staff have been trained on procurement, and waste is reduced by use of good purchasing techniques.

Office of Environmental Assistance — Since the creation of its market development program, the OEA has promoted buying recycled products as a means of supporting the recycling infrastructure. Over the years, OEA staff has held "Buy Recycled" trade shows and conferences, developed fact sheets, trained state purchasers about recycled content products, and much more. The OEA strives to purchase environmental products whenever possible. The MPCA and OEA are working jointly to develop native landscaping that requires less water and pesticide application.

The OEA's expanded procurement focus continues to include other environmental characteristics, such as toxicity reduction, durability, recyclability, energy efficiency, etc. This is referred to as environmental preferable purchasing (EPP). The OEA is working with the Department of Administration to promote environmental purchases and building practices in state-leased buildings.

The OEA tracks purchases of Blue Planet fuel and E85 fuel used in the two flexible fuel vehicles that are assigned to the OEA. OEA is working closely with the Department of Administration's acquisition specialists to incorporate environmental specifications into several state purchasing contracts. Together, the OEA and the Department of Administration have:

- established the first state contract for recycled latex paint in July 2000
- established a state contract for flooring in June 2000, which included several environmental specifications. The solicitation set air quality standards for carpet; required vendors to recycle old carpet; and encouraged vendors to bid carpet, tile, and rubber flooring made with recycled materials.
- added a less toxic cleaner to the Central Stores catalog for the first time
- Initiated discussions with the Department of Administration on mercury component disclosure or phase-out requirements in the 2002 motor vehicle request for bids (RFB), in partnership with PCA and INFORM, Inc. The RFB, issued in October 2001, included a disclosure requirement and statement of intent to purchase only mercury-free vehicles starting in the next two to three years.

The OEA promotes environmentally preferable contracts to state agencies and local political subdivisions. The OEA has made procurement information available via its web site and links to the Department. of Administration's site. When appropriate, the OEA documents and shares its results with other states as well as Minnesota businesses, schools, and general consumers.

This past year, the OEA and Department of Administration held monthly meetings with the Environmentally Responsible Work Group and focused on a promotional campaign to increase the purchase of recycled copy paper and recycled latex paint in state government. For the first quarter of fiscal year 2002 (July to September 2001), Central Stores reported that nearly 90 percent of the copy paper sold to state agencies and local political subdivisions is made from recycled paper, up from just 50 percent at the beginning of the year.

The OEA is working with the Department of Administration to encourage the use of reusable crates, rather than disposable boxes, when state agencies contract with professional movers. The OEA is also working with architects to encourage the use of resource efficient materials and practices in new state buildings under construction. The OEA continues to help to promote environmentally preferable chemicals via the Internet. The web site address for the Carbohydrate Economy Clearinghouse is http://www.carbohydrateeconomy.org.

OEA's web site has been expanded to include information to help local purchasers buy recycled products. The OEA along with the metropolitan counties, provides the *Environmentally Preferable Purchasing Guide,* a resource for state, local, and school purchasers to help them identify a variety of environmental products.

Metropolitan Airports Commission — MAC Purchasing Department considers the environmental implications when procuring goods and materials for the airports. MSDSs are reviewed; durability, reuseability, and disposal costs, etc. are evaluated in addition to following policies and procedures. (See Part 2—*Policy and Regulatory Activities.*)

Metropolitan Council – Environmental Services — Procurement and materials management are essential to the beginning and sustaining of a P2 program. In previous sections of this report, various efforts have been described in the purchasing of recycled and recyclable materials and in product substitutions. A workshop centered on The Environmentally Preferable Purchasing Guide was conducted specifically for MCES procurement staff in 2001. Most of the senior management team was also in attendance to lend their support to the concept. Staff was encouraged to be innovative in purchasing decisions while balancing cost with customer support.

The Cottage Grove WWTP will be rebuilt into the significantly larger South Washington County Plant. The capital project design guidelines and guide specifications have been written for the first time to include some aspects of sustainability in the awarding of the contract and in the actual project design and construction. Some of the potential aspects of the new building are daylighting, energy-efficient fixtures, heat exchangers, and low volatile organic compounds in building materials and coatings.

A workshop was conducted in 2001 by the project's architect, LHB, for all project partners. At the workshop, numerous principles of Design for the Environment (DfE) were presented and discussed. The focus was made on energy efficiency, resource (building material) efficiency, and indoor air quality for the most positive impact on the Cottage Grove site. A ranking system was described which would assist in making the final choices for the project.

Recycling of paper, metal cans, and clear glass containers occurs at all MCES locations. At the larger facilities plastic and metal drums, scrap metal, wood pallets, cardboard, and packing materials are reused as much as possible and eventually recycled. A new materials management information system has been installed which has the potential capability for screening purchases for P2 considerations such as environmental and health rankings and recyclability and recycled content material.

Metropolitan Mosquito Control District — The MMCD team responsible for management of hazardous materials and pollution prevention reviews new materials and products intended for use by MMCD for safety and environmental hazards, prior to purchase. If a material or product is found to have characteristics that pose safety concerns for employees or potential environmental hazards, the team would recommend that a replacement material or product be purchased that's not a safety concern for MMCD staff or poses any environmental hazards.

Pollution Control Agency — The MPCA has taken steps to reduce emissions and improve the environmental performance of its fleet of 140 vehicles. This includes:

- developing a procurement policy giving preference to flexible fuel vehicles (FFVs). The number of FFVs increased by nearly 50 percent to around 30 vehicles.
- instructing staff to use cleaner burning 85 percent ethanol fuel in FFVs when feasible. Adding two high-efficient, low-emitting hybrid gas/electric vehicles to the fleet. A 70-mpg Honda Insight was acquired in March, and a Toyota Prius, rated at about 50 mpg, was added in September.
- testing alternative-fuel vehicles for possible addition to the fleet including a natural gas-powered Honda Civic and a propane-powered Ford F150 truck
- working on policies and practices to purchase the most fuel-efficient, least polluting vehicle that meets needs and to keep vehicles well-maintained and using cleaner fuels

Minnesota State Colleges and Universities

Bemidji State University — BSU offices are encouraged to incorporate waste reduction and pollution prevention into their daily operations. Remanufactured printing cartridges are available from office supply vendors, recycled content copy and computer printer paper are supplied through Central Stores, and double-sided copying is encouraged throughout campus.

North Hennepin Community College — Several items of concern are considered when making purchasing decisions here on campus. Such things as the life expectancy of the product, shelf life for chemicals, number of uses it can be put to, toxicity of chemical used in an expendable product, versatility of the product, and any special disposal requirement that may be required. The purchase of paper products containing some amount of recycled material is strongly encouraged.

St. Cloud State University (SCSU) — SCSU uses toilet paper and towels of 100 percent total recycled fiber content and 40 percent, or more, post-consumer fiber content.

Department of Transportation — Mn/DOT constantly eliminates and/or reduces waste streams. Finding new products and technologies that reduce toxicity and conserve the environment.

University of Minnesota — The university has updated its Standards and Procedures for Construction to address Energy Conservation Elements outlined below.

Design objectives

- Architects, Engineers, and other Design Consultants shall design energy efficient buildings in compliance with the latest version of ASHRAE 90.1 that provide the environment required by our teaching and research faculties to carry out their work in an effective manner.
- The A/E shall utilize the XCEL Energy Assets Custom Energy Assistance Program to assist in its efforts to design an energy efficient project. These services consist of modeling the projected energy use of proposed designs, suggesting strategies to reduce the projected energy use, and projecting the construction costs and energy savings associated with the suggested strategies. Review the suggested, project specific energy conservation strategies with the Facilities Management Energy Conservation Group.
- The XCEL Energy Assets Custom Energy Assistance Program shall suggest energy efficient design strategies, which consist of state-of-the-art, proven design principles and technologies. Strategies not proven under field operation conditions are not acceptable.
- The responsibility for choosing and incorporating energy efficient strategies into the design remains that of the design team and the university.
- Include the means to measure the results of the energy efficient design strategies in all projects.

Glass area. Where glass is employed, consideration shall be given to the economic feasibility of insulating glass, reflective glass, and blinds or other shading devices.

Mechanical systems. Plumbing, heating, cooling and ventilating systems, and control strategies shall be selected and designed to insure minimum consumption of energy consistent with necessary environmental conditions. Consider heat recovery and recycling where economically feasible.

Lighting systems. Select and design lighting systems and controls to ensure minimum consumption of energy while providing quality illumination for the visual tasks in each room or space. Avoid general high levels of illumination except in the most critical applications. Provide specialized supplementary lighting sources at the task area in lieu of uniform high level illumination throughout. Switching or

other lighting control devices shall provide for flexible levels of lighting. Minimize decorative lighting. Consider the principles of daylighting for new buildings.

Evidence of compliance. The A/E shall submit calculations and other data with the Design Development Documents to demonstrate compliance with the conservation policy and the estimated cost impact on construction and operation.

The University of Minnesota Waste Abatement Committee has made a concerted effort to bring green building concepts to the university. Facilities Management has agreed to a pilot project that will use a Sustainable Design Guide and Rating System to guide the specifications, bidding, and construction of the university's planned Studio Arts Building. An interdisciplinary team created the Sustainable Design Guide and Rating System for the medical, institutional, and office buildings constructed by Hennepin County, Minnesota. The purpose of this system is to encourage environmentally responsible design practices by rating facility performance in areas like energy efficiency, indoor air quality, and waste management. Hennepin County Property Services and the county's Environmental Management Division worked with a team of university researchers from the College of Architecture and Landscape Architecture and other advisors to develop the system. The system provides approximately 45 strategies that are organized according to six environmental topics:

- ***Site.*** The site-related goals of the system are to maintain and restore the ecology of the site, respond to the microclimate to improve energy efficiency and comfort, to utilize water saving and low-maintenance native plant materials, protect water quality and use biological systems to treat wastewater.
- ***Water.*** The water-related goals, which focus on building water consumption, are to reduce potable water consumption in the building fixture and the cooling tower design and use graywater systems to reuse water for site irrigation.
- ***Energy.*** The primary goal is to reduce energy consumption for heating, cooling, lighting, and other equipment and systems. A related goal is to use energy sources that are renewable and that have low environmental impacts (i.e. lower impact on air pollution or global warming).
- ***Indoor Air Quality.*** Goal is to provide a healthy indoor environment with good air quality.
- ***Human Factors.*** Indoor spaces must be appropriately designed to enhance the quality of the thermal, acoustical, and visual environments (including lighting and daylighting).
- ***Materials.*** Goals of the system are to reduce the consumption of virgin materials especially from nonrenewable sources, and to select materials that are durable, manufactured locally, have low environmental impacts in their manufacturing process, and contribute to a healthy indoor environment.
- ***Waste.*** Waste-related goals include the reduction and recycling of waste during construction as well as during the operating life of the building. Also, hazardous waste must be reduced and disposed of properly. A strategic design goal of the system is to reduce demolition waste by designing buildings to facilitate building disassembly and adaptability.

The strategies are phrased to achieve a specific design solution or practice, such as "use recycled content and building materials." To integrate environmentally responsible design easily and effectively into the building process, it became important not just to indicate what to do, but what actions to take during each step of the process. Instead of a list of strategies, the system is organized into a matrix. Within each strategy are series of actions organized by design phases and a performance indicator for scoring (see http://www.sustainabledesignguide.umn.edu).

University of Minnesota students craving a caffeine fix on campus will soon have the choice to kick-start their senses of consumer activism and global sustainability as well as their sleep-deprived nervous systems. The Minnesota Student Association forum unanimously approved a resolution requesting that University Dining Services (UDS) offer fair-trade coffee blends in on-campus coffee shops and residence hall cafeterias. Fair-trade for coffee farmers means community development, health, education, and environmental stewardship. The majority of fair-trade growers engage in environmentally friendly practices, such as producing shade grown coffee. Some 85 percent of all fair-trade certified coffee is organic and shade grown. Shade grown coffee is grown in the traditional manner, with coffee plants interspersed under a canopy of trees resulting in a natural balance with the canopy trees providing organic material for the soil, habitat for birds and beneficial insects. Organic coffee is grown without the use of any chemical fertilizers or pesticides and promotes sustainable farming practices resulting in healthier farmers, healthier consumers, and less pollution.

The University of Minnesota is a consumer, and as a consumer it has a lot of power. Students should have a crucial interest in how that buying power is directed. All companies the university currently has contracts with already have at least one fair-trade coffee blend and, for now, their prices will be the same as normal blends. The wholesale cost of fair-trade coffee is approximately $1 to $2.50 more per pound than normal coffee. UDS Catering Services will also offer a fair-trade blend at the same price as its other gourmet coffees. UDS will probably abide by decision of the Residence Hall Association student group, which voted to accept the fair-trade blends in residence hall cafeterias. It will likely be available to residence hall students with no rise in meal plan costs.

31. Remanufactured Parts

Department of Administration — The Materials Management Division specifies remanufactured automotive products and has developed contracts for remanufactured automotive products for state agencies, which included diesel engines, transmission, alternators, and starters. The Travel Management Division uses remanufactured parts for vehicle repair whenever available.

Department of Corrections

MCF-SHK — SHK purchases remanufactured parts when available for maintenance repairs. This has an economical advantage as well as an environmental advantage.

Metropolitan Airports Commission — MAC fleet/vehicle maintenance uses remanufactured starters, alternators, water pumps, calipers, turbo chargers and injectors and relined brake shoes. Rebuildable cores are exchanged for the newly remanufactured parts. Other parts are sent out for rebuilding/overhaul whenever it is a suitable alternative to new parts.

Pollution Control Agency — WRRC promoted a collection program for ink jet cartridges with information provided by the Recycling Association of Minnesota. The cartridges are mailed in a postage-paid envelope to a recycling center in Franklin, Tennessee. A supply of envelopes is kept on each floor.

One agency allotment number was established for purchasing toner cartridges for fax and laser printers in fiscal year 2000. The office administrators identified three vendors that provide remanufactured cartridges and provided that information to the purchasing staff. A majority of the office machines use remanufactured cartridges; however, a few laser printers have experienced problems. Toner cartridges for the leased photocopiers are provided by the vendor. A recycling container for spent cartridges is located in the Service Center.

Minnesota State Colleges and Universities

North Hennepin Community College — All departments of this college are encouraged to return copier toner cartridges to the manufacturer for reuse. Ink cartridges from NHCC's larger machines are sent in for re-inking and reuse in the duplicating section.

St. Cloud State University (SCSU) — SCSU uses remanufactured photocopier cartridges.

32. Tanks

Department of Administration — The Plant Management Division removed all known underground fuel storage tanks. Aboveground storage tanks were installed in all but one location. The remaining tank will be installed by January 1, 2000.

Department of Corrections

MCF-OPH — The underground diesel tank was emptied, flushed, and tested two years ago. The tank contents are checked monthly to determine level and to ensure there is no leakage. The overhead tank is on a curbed cement spill pad, which would hold any leaks or spills that might occur until they could be cleaned up.

MCF-RC — This facility has all aboveground tanks with spill containment.

MCF-SCL — SCL has removed a number of underground and aboveground tanks. All tanks are currently reported in accordance with MPCA requirements. The facility reduces the risk of oil and fuel spills and groundwater and soil contamination. SCL plans to continue to monitor tank levels to identify possible leaks.

MCF-SHK — SHK has electronic leak detection on two underground storage tanks. On the other tank, staff uses preventive maintenance and checks monthly for leaks.

Metropolitan Airports Commission — MAC has removed, replaced, or upgraded all MAC owned and operated regulated underground storage tanks. All existing tanks are fully compliant with 1998 federal regulations. MAC will eliminate other tanks as they become obsolete or redundant. Tank monitoring systems at the reliever airports, although in compliance, are in the process of being upgraded for improved inventory control. At MSP, a new fuel island was installed for all MAC vehicles and heavy equipment. This monitoring/inventory control system can track fuel usage per vehicle mile or hour. This information is incorporated into maintenance records and often assists in determining the need for making repairs.

Metropolitan Council – Environmental Services — The MCES has over 70 aboveground storage tanks and 30 underground storage tanks that are actively used to store petroleum or other regulated chemicals. These are monitored and/or inspected on a regular basis and meet all current requirements for spill prevention and secondary containment.

Minnesota State Colleges and Universities

Bemidji State University — Preliminary preparations to remove a 560-gallon underground gasoline tank were made this spring. The actual removal will be completed this fall. The tank has been used for boat motor fuel at the BSU Outdoor Program Center. Its removal will mitigate potential pollution problems caused by leaks and spills.

North Hennepin Community College — There are two tanks located on this campus. Both are fuel tanks. A 10,000 gallon underground storage tank is used for #2 fuel oil for our boiler plant, and a

250 gallon aboveground tank is used for diesel fuel for the college's lawn equipment. The monitoring and secondary containment equipment on these tanks are checked frequently to insure leaks, spills, or contamination do not occur. An Emergency Response Plan is maintained on site for any future contingency.

St. Cloud State University (SCSU) — Only a single unused underground storage tank remains at SCSU. It is empty and below the basement floor of an occupied house. Spill containment control was expanded outside the dike to the delivery connections of SCSU's twin #2 fuel oil aboveground storage tanks.

Department of Transportation — Salt brine tanks are used to produce and store salt brine. Currently, salt brine production systems are of double-walled fiberglass construction. This greatly reduces the possibility of a release from the system since fiberglass is resistant to degradation from salt. Mn/DOT fueling systems are comprised of double-walled underground or aboveground petroleum tanks and pipes. They are equipped with leak detection, spill prevention and overfill prevention equipment.

University of Minnesota — The university has reviewed and updated its Spill Prevention Control and Countermeasures (SPCC) plan (for details, visit the web site at http://www.epa.gov/superfund/contacts/sfhotlne/opa.htm). The university's Twin Cities campus has hundreds of fuel storage tanks, emergency generator fuel tanks, oil-filled transformers and drums containing petroleum products that fall under this plan.

The EPA developed the Oil Spill Program as mandated by the Oil Pollution Act of 1990, which amends CWA Section 311(j). There are four main goals of the Oil Spill Program: preparedness and prevention; response; compensation and liability; and research and training. Preparedness and prevention is the best defense against mitigating the damage caused by oil spills. EPA requires high-risk facilities to prepare and implement SPCC plans to achieve the goal of preventing oil spills from reaching navigable waters.

The SPCC plan requirements have three goals. The first is to prevent oil spills. Operating procedures, such as inspections, record keeping, security, personnel training, and tank specifications, address this goal (40 CFR Section 112.7(e)). The second goal is to prevent spills from reaching navigable waters or adjoining shoreline. All SPCC facilities must install appropriate containment and/or diversionary structures to prevent spills from reaching waters, unless installation is impracticable (40 CFR Section 112.7(c)). In addition to the minimum requirement for appropriate containment and/or diversionary structures, other secondary containment requirements are specified in 40 CFR Section 112.7(e). For example, bulk storage tanks must have sufficient secondary containment to hold the contents of the largest single tank, allowing for precipitation. The third goal of the SPCC plan is to prepare for responding to an oil spill. Facilities who cannot install appropriate containment and/or diversionary structures must be able to clearly demonstrate the impracticability of installation, and must have a strong oil spill contingency plan and a written commitment of response manpower, equipment, and materials (40 CFR Section 112.7(d)).

33. Technical Support

Department of Administration — The Resource Recovery Office provides technical support to agencies, which includes referrals to Minnesota Technical Assistance Program. The office also provided recycling education, collection, transportation and marketing services to 20,505 state employees at 149 individual locations. The Resource Recovery Office measured and reported the recycling progress of 22,323 state employees at 255 individual locations with a combined seven-county recycling recovery rate of 61 percent. The Resource Recovery Office provides technical

assistance to the OEA by calculating the recycling progress of regional facilities in the seven-county Twin Cities' area and prepared the composting application to the City of St. Paul for the current permit regarding Capitol Complex vegetation composting.

Department of Corrections — MnTAP and county hazardous waste management offices are consulted whenever a questionable waste is to be disposed of to ensure proper procedures are used. For example, OPH's Safety Officer works closely with the Washington County Hazardous Materials staff person to discuss and dispose of any unusual waste or products we are not sure about. Outside vendors are consulted when necessary or for testing purposes.

Office of Environmental Assistance — During 2000 and 2001, MnTAP activities resulted in reductions of 11.2 million pounds of waste and 89 million gallons of water. As a result of these reductions, MnTAP was able to save companies $5.2 million (see table below). For every dollar spent on MnTAP, industry was able to show a $2 saving as a result of implementing pollution prevention practices with assistance from MnTAP.

Reductions and savings to companies, 2000-2001

Activity	Waste reduced (lbs.)		Water conserved (gallons)		Cost savings		Total savings
	2000	2001	2000	2001	2000	2001	
Telephone/ outreach	8,800	76,250			$30,000	$315,000	$345,000
Site visits	911,600	2,954,853	26,960,000	49,700,000	2,426,700	760,802	3,187,502
Student interns	4,724,401	131,810	3,600,000	9,500,000	943,015	123,728	1,066,743
Materials exchange	1,164,543	1,259,956			282,365	372,533	654,898
Total	6,809,344	4,422,869	30,560,000	59,200,000	$3,682,080	$1,572,063	$5,254,143

During 2000 and 2001, MnTAP staff responded to 2,463 technical assistance and materials exchange calls, concentrated in the metal fabricating, printing and vehicle maintenance sectors. MnTAP staff conducted 303 site visits, with the majority in the metal fabrication, electronics, and machinery/computer instrumentation industries.

In the last two years, MnTAP placed 15 students in industrial settings, with 70 percent of the companies acting on the recommendations developed by the interns. As a result of these projects, the participating companies reduced waste by over 4.8 million pounds of waste and decreased water use by 13.1 million gallons. These companies saved over $1 million in avoided disposal costs and reduced spending on raw materials and water. As companies complete implementation of these projects, MnTAP projects additional reductions of 150 million pounds of waste and 23 million gallons of water, with additional savings of $1.4 million.

The OEA provides technical assistance to counties in solid waste management planning and reporting on progress in achieving source reduction and recycling goals. The OEA revised the SCORE Source Reduction Checklist, a list of strategies and programs that counties can implement to reduce waste. Counties can receive credit towards their recycling goals for implementing activities on the checklist. The checklist now lists over 40 different strategies and programs to reduce waste at the local level. It is intended to be used as a planning tool in county solid waste management planning. In addition, the OEA Source Reduction Team has begun to work closely with county planners to plan and implement source reduction programs.

Materials developed during the project entitled the "Source Reduction Challenge," are available from the OEA Clearinghouse and OEA's web site. They include eight material specific fact sheets and an office paper reduction kit. Technical assistance is available as requested.

The Counties and Cities Involved in Source Reduction and Recycling (CISRR) council, including Materials Exchange Alliance, meets every other month (six times a year) at various locations throughout Minnesota. Each meeting focuses on new topics in waste reduction, reuse, and recycling and provides opportunities for networking and assistance. All local government staff (cities, counties and districts) are invited and encouraged to attend all six meetings.

The meetings focus on identifying and discussing:

- Source reduction, reuse and recycling opportunities
- Regional recycling markets
- Opportunities that exist to exchange materials between businesses and other organizations in that region and efforts to document the exchange activity
- Increase in materials exchange activities around the state

The OEA continues to publish the *CISRR Newsletter* four times a year. The newsletter provides highlights from CISRR meetings and also includes materials exchange, Waste Wise, and county updates.

In 1996, the OEA and ERC were delegated responsibility for administering the P2 Progress Report (P2PR). The ERC collects the forms from reporting facilities and works with the OEA to review them for completeness. The OEA uses the P2PR along with the Toxic Release Inventory Form R reports to analyze pollution prevention trends, determine success stories, and establish targets for technical (in conjunction with MnTAP) and financial assistance efforts. A new tool incorporated into P2 analysis during fiscal year 1997 was the inclusion of toxicity data for the chemicals reported through the Form R and P2PR. This allows the OEA to perform analysis on not only the volume of wastes being generated, but also to consider the hazard potential of the waste streams as well. Details are presented in the 2000 Pollution Prevention Evaluation Report.

Metropolitan Airports Commission — The Environment Department provides technical support to all MAC offices/divisions, as well as airport tenants and surrounding communities whenever possible. Assistance for MAC's tenants is accomplished through phone calls, acting as a regulatory liaison, informational meetings, and providing resources. This support assists the tenants in recognizing and understanding their obligations to the regulatory agencies.

Metropolitan Council – Environmental Services — In its participation with IPPAT, MCES is part of an information network that is very useful in the P2 support offered to public agencies. As a regulatory agency, MCES is active in P2 technical support through the Industrial Waste and Pollution Prevention (IWPP) section, which continues to promote P2 to its more than 800 permitted industrial users. During on-site inspections, IWPP staff regularly discuss P2 issues and point out process areas where P2 would result in waste reduction. Although MCES collects fees based on volumes of wastewater through its Service Availability Charge (SAC), wastewater reduction and cost-savings are encouraged for industrial users. Fees can be reduced based on lower volumes or strengths of discharges. P2 activities by industries are routinely tracked.

Specific examples of these efforts are that when permit renewal notices are sent out, there is a written recommendation that the industrial user contact the Minnesota Technical Assistance Program (MnTAP) for assistance in reducing wastewater volumes and to address any other P2 concerns.

Work on mercury reduction continues with the Minnesota Dental Association in the distribution of recycling fact sheets and the evaluation of amalgam separation equipment (see detailed discussion in Section 16. Heavy Metals). Along with the OEA, a summary report was distributed to industrial users on chemical impurities in chemicals. Possible contaminants are mercury, arsenic, cadmium, chromium, copper, lead, nickel, zinc, molybdenum, and phosphorous.

The IWPP established a new P2 Team in 1997. The purpose of the team is to "initiate, support, integrate and promote P2 through education, assistance, and partnering." This will result in a reduction of toxics, conventional loadings, and discharge volumes to the collection and treatment system. So far, the P2 team has designed and purchased a new P2 display, is developing a new educational P2 brochure for households, and has registered as a member in both the National Pollution Prevention Roundtable and the Great Lakes Regional Pollution Prevention Roundtable. It also serves as the oversight group for the Open Channel News, a publication specifically for industrial users.

The IWPP has participated in national, regional, and local P2 conferences and has cooperated with Wakota CAER (Community Awareness and Emergency Response), North Metro CAER, and MnTAP (Minnesota Technical Assistance Program) in the sharing of information and public displays. An intranet site is in place for the Environmental Planning and Evaluation Department (EPE) within MCES which includes "P2 Pages" to promote P2 and encourage new ideas. The Internet site for the public's viewing can be found at http://www.metrocouncil.org/environment/PollutionPrevention/.

Peer review and exchanges of information have occurred with the Massachusetts Water Resources Authority (Strategic Environmental Partnership), National Science Foundation (Environmental Technology Verification Program), U.S. Environmental Protection Agency, Association of Metropolitan Sewerage Agencies (AMSA), and OEA's Healthcare Environmental Awareness and Resource Reduction Team (HEARRT).

In 2000, the IWPP identified permitted industrial users that are contributing high phosphorous loadings to the collection and treatment system. An information letter was mailed to these users, and MnTAP made follow-up telephone calls offering technical assistance in phosphorous reduction

Minnesota State Colleges and Universities

North Hennepin Community College — Often NHCC's first contact for technical support is its contracted specialist, MacNeil Environmental Services, employed by the college in a consultant capacity on environmental and other safety issues.

Department of Transportation — Mn/DOT conducts three meetings annually with district/division personnel who have taken on the additional part-time task of waste management coordinators. This group actively integrates waste minimization and P2 into all of the department's functions.

Mn/DOT has developed a waste management procedure manual, which incorporates general waste minimization techniques for each hazardous or problem waste generated. This manual outlines waste management procedures which are legal, practical, and cost-effective ways to minimize risk to the environment. These manuals were distributed to all Mn/DOT facilities.

Mn/DOT has developed a bridge paint removal manual designed as a guide, to comply with Minnesota Air Quality, Waste Management Regulations, and to minimize risk to the environment. The manual is available on the Mn/DOT web site at www.dot.state.us/environment/publications/publications.html for other state agencies, counties, and cities to use.

Mn/DOT has dedicated to studying, coordinating, and evaluating pollution prevention opportunities (as they relate to toxic reduction) within Mn/DOT. The key task is to research and evaluate new products and/or procedures as they relate to Mn/DOT and to recommend changes to existing products and/or

procedures when they prove to be more effective from an environmental, economical and/or regulatory standpoint.

Mn/DOT conducts workshops to assist staff in complying with federal and state regulations associated with aboveground and underground storage tank systems. Mn/DOT also provides on-going guidance for local communities interested in designing and/or improving bicycling, walking and telecommuting programs or initiatives.

University of Minnesota — The Center for Sustainable Building Research (CSBR) was established as an official unit within the College of Architecture and Landscape Architecture (CALA) in 2001 although the staff has been conducting building research in CALA since 1997. There is a substantial and growing amount of building research activity in the following areas: sustainable design, energy-efficient buildings, windows and glazing research, building design process and evaluation, human factors, and building science. Sponsors of CSBR projects include the U.S. Department of Energy, and state agencies such as the Minnesota Departments of Natural Resources and Transportation, and the Office of Environmental Assistance. Other sponsors include building industry sources such as Aspen Research Corporation.

The interdisciplinary nature of CSBR is reflected in the staff that includes architects, mechanical engineers, and psychologists. In addition, there are several affiliated faculty in CALA as well as in other units such as the College of Natural Resources and the College of Human Ecology. The Center for Sustainable Building Research is a place for organizing and effectively growing the research and outreach missions of the college, as well as working with other units to enhance CALA's teaching mission. CSBR serves as a resource for the state, the design professions, and the building industry.

CSBR is currently involved in two pertinent building design process and evaluation research projects:

- Building Evaluation and Design Assistance: The Minnesota Department of Natural Resources (DNR) is in the process of designing and building a number of area offices throughout the state. These offices must perform a variety of functions and support the DNR organization in its goals. In recent years, significant new directions for managing the agency have been developed and a few area offices have been built. The purpose of this research project is to provide feedback on projects that have already been constructed and to develop an effective approach to the design of new area office facilities.
- The first phase of this project consisted of a post-occupancy evaluation of two existing DNR Area Offices and the development of a guidance document for future design and construction of such facilities. The second phase includes assistance with the programming and design of two new area office facilities based on the lessons learned from past projects. In addition to improving the spatial programming and use of the buildings, this project also provides a process to ensure the sustainability of DNR buildings.
- State Building Database (BRiDGe - Building Research Data Group): This project is intended to be a first step in creating a constantly evolving knowledge base for building projects and a feedback loop from actual project experience back to decision makers, owners, designers, researchers, and students. The Minnesota System of Colleges and Universities (MNSCU), the University of Minnesota, and Minnesota state agencies construct and remodel dozens of major facilities every year. There is a need to document these projects in a shared database so agencies can learn from each other's experience and improve on the ways buildings are currently built.
- The goal is to provide high performance buildings that represent the best investment of state money over the life cycle of each project. In addition to documenting the building design, the database will include information on the building delivery process, initial and operating costs, sustainable design strategies, improved workplace strategies, successes and failures, and lessons learned. Post

Occupancy Evaluations (POEs) are being conducted that focus on building energy consumption, occupant satisfaction, design and construction process, sustainable strategies employed, and materials, systems and details. The initial three projects are libraries at St. Cloud State University, Winona State, and the University of Minnesota Duluth.

34. Tires

Department of Administration — The Materials Management Division has developed contracts for tire recovery and for retread tires that use old tire casings. The Travel Management Division, Plant Management Division, Department of Transportation, and other state agencies may purchase from these contracts. The state and CPV members purchased in excess of $250,000 in retread tires. The Travel Management Division's used tires are recycled through a vendor licensed under state contract.

Department of Corrections — Tires are purchased from a vendor who recycles them.

Metropolitan Airports Commission — High mileage tires have provided the most economical service in many applications. Using these tires reduces both the number of tires purchased and the number of tires requiring disposal. Tractor tires that can no longer be used by MAC Maintenance on the paved surfaces of the airport are reused in off-road (agricultural) applications instead of being disposed of. All vehicle and heavy equipment tires are transported to and recycled by a permitted vendor when no longer useable.

Metropolitan Council – Environmental Services — When not exchanged directly with a vendor, used vehicle tires are transported to GreenMan Technologies of Minnesota, Inc. in Savage, where they are processed into a fuel source. When not exchanged directly with a vendor, used vehicle tires are transported to GreenMan Technologies of Minnesota, Inc. in Savage, where they are processed into a fuel source. Presently, new light truck and automobile tires can be purchased through the state contract at a price comparable to or cheaper than retreads. Retreaded tires were used on large trailers for non-steering axles, however, the hauling of sludge and biosolid products has been greatly reduced due to changes in the solids handling programs.

Minnesota State Colleges and Universities

North Hennepin Community College — When possible old tires are turned in for recycling at time of new purchases. All other tires are recycled through local vendors.

St. Cloud State University (SCSU) — About 95 tires are recycled each year at SCSU at a cost of about $1.25 each. These tires are ground up and become components in other products.

Department of Transportation — Mn/DOT recycles all waste tire generated by Mn/DOT as well as the tires that the public has lost along Mn/DOT right-of-way. Mn/DOT recaps a small percentage of waste tires. However, due to the conditions under which Mn/DOT vehicles are operated, i.e. plowing snow, only a limited amount of re-capped tires can be safely used. Mn/DOT has researched the possibility of using ground tires as a base material in highway construction. This material is approved for above water applications. For most Mn/DOT projects, there is not a large enough supply of this material. However for smaller projects, there is a large enough supply. Research articles are available.

35. Water Treatment and Conservation

Department of Administration — The Plant Management Division rebuilds parking lots and structures to meet water division guidelines. The Materials Management Division developed a contract for salmon and trout feed that reduces the effluent produced by excess feeding of fish. The water quality downstream from state hatcheries will be improved as a result of this contract.

Department of Corrections

MCF-OPH — Water-saving toilet fixtures with a timed flushing device have been installed in inmate cells. The facility has used timed showers since opening.

Plans call for replacing the current 5 to 6 gallon flush toilets with a 2.5 gallon flush as part of the facilities total effort to reduce water usage by up to 52 percent over current use. The institution has used timed shower valves since opening.

MCF-RC — The facility is equipped with a computerized water-control system for all showers, sinks, and toilets. Ultra-low flush toilets are used with flood-control devices that prevent flooding of toilets. The outdoor sprinkler system is on a timer to conserve water.

MCF-SCL — The outdoor sprinklers are on timers, and the facility has installed low-flow toilets in the new E-house construction. This will reduce water bills and save resources. All new construction projects will include low-flow toilets.

MCF-SHK — SHK works with Freemont Industries (state contract). The facility has aerators on its faucets and uses low-flow showerheads. The toilets use 1.5 gallons/flush.

Metropolitan Airports Commission — The truck/equipment wash bay in the Field Maintenance building uses a complete water recycling system. This greatly reduces the amount of wastewater (gray water) generated. Restrooms in the Lindbergh Terminal are being upgraded with water conserving devices such as water saver urinals and toilets with electronic flush valves and sinks with electronic faucets and aerators. Standards for new construction require these water saving devices. The new Humphrey Terminal and the remodeled MAC General Office were built to these standards.

Metropolitan Council – Environmental Services — The MCES is the division of the Metropolitan Council which treats wastewater. The system collects and treats over 300 million gallons of wastewater per day from 104 communities and over 2 million people. The MCES operates about 600 miles of interceptor sewers, 65 lift (pumping) stations, 178 metering stations, and eight treatment plants. Clean effluent is discharged to four area rivers—the Mississippi, Minnesota, St. Croix, and Vermillion. From the metro plant alone, over 74 *billion* gallons of treated wastewater was discharged to the Mississippi. P2 affecting the quality of effluent was described in the section on heavy metals. Groundwater conservation was described in the section on groundwater wells.

One area that clearly falls under P2 in MCES operations is the beneficial reuse of residual solids from the wastewater treatment process. Biosolids, or sewage sludge, at the two largest treatment plants are incinerated in multiple-hearth furnaces resulting in an 80 percent reduction in volume of residual solids. The ongoing ash utilization program incorporates the ash from incinerated biosolids into flowable fill, cement/concrete, structural fill, and asphalt projects. In 2000, a total of 14,851 dry tons from the metro WWTP and 2,402 dry tons from the Seneca WWTP (Eagan, Dakota County) was used.

N-Viro Soil is a program that blends alkaline admixtures—previous "waste" products from lime manufacturing and coal-fired power plants—and biosolids also for use in agricultural and horticultural applications. In 2000, 2,088 dry tons of biosolids from the Seneca WWTP were blended with admixtures to produce approximately 18,559 wet tons of N-Viro Soil. Straight biosolids—without any blended components—are typically landspread on farm fields. A total of 3,214 tons from MCES Plants was land-applied in 2000.

The entire MCES, with an emphasis on the work of the IWPP, was a recipient of an honorable mention for the 1995 Minnesota Governor's Award for Excellence in Pollution Prevention.

Office of Environmental Assistance — MnTAP has helped wastewater treatment plants or publicly owned treatment works (POTWs) meet discharge limits by working with their industrial users to reduce phosphorus, biochemical oxygen demand (BOD), total suspended solids (TSS), and water use. Partially supported with a two-year grant from the McKnight Foundation, MnTAP has conducted outreach and technical assistance to 600 wastewater treatment plants in Minnesota making them more aware of the benefits of pollution prevention and helping industrial users implement pollution prevention practices.

As a result of this project many POTWs were able to reduce phosphorus or other pollutants by partnering with their industries and avoiding installation of additional treatment capacity. Relationships were built between cities and industries and between MnTAP and POTWs. POTWs were able to see the benefits of pollution prevention, and industries to realize cost savings by implementing pollution prevention practices.

Pollution Control Agency — The new Brainerd office has leased premises that will feature water conservation fixtures including low-volume flush toilets.

Minnesota State Colleges and Universities

North Hennepin Community College — Plumbing fixtures and supplies with lower gallon per minute ratings are used at this facility whenever possible, depending upon the application requirements. Chemically treated water systems like the college's boiler water, and cooling tower chemical treatment systems, as well as closed loop heating and cooling systems are properly isolated from potable water supply by approved Antisiphon devices.

St. Cloud State University (SCSU) — This past year SCSI continued to make progress in replacing restroom urinal flushing systems to reduce water use. Payback was about one year. Extensive lead-in-water testing has been completed in the campus houses being used for office space. Results were all well below the action level and most were below 5.0 ug/l. An MnSCU survey resulted in some water conservation improvements.

Department of Transportation — Mn/DOT is starting to implement vacuum toilets, waterless urinals, and low-volume sinks to save thousands of gallons of water each day, reducing the size of drain fields needed to dispose of wastewater. Mn/DOT is also developing a waste trap and sediment trap management procedure when disposing of wastewater that will be legal, practical, cost-effective, and minimizes risk to the environment.

Mn/DOT practices and promotes the use of native plants such as: grasses, trees and shrubs. By using native plantings, maintenance demands are reduced which includes less watering.

36. Other

Department of Administration — The Plant Management Division composts yard waste when practical. The Resource Recovery Office assisted with the application for a city permit.

The Materials Management Division has a contract for refurbished Herman Miller system furniture that allows state agencies and Cooperative Purchasing Venture members to purchase refurbished products rather than new product. This contract requires reupholstery to meet BPIA standards for office

furniture recycling (February 1994) and allows trade-in of Herman Miller System Products. The Materials Management Division has created contracts with MINNCOR for furniture refinishing, reupholstery, and refurnishing.

Department of Corrections

MCF-ML — Moose Lake will be installing Oxygen monitors to the existing boilers to increase their burning efficiency. Estimates for cost savings or natural gas savings are not yet available.

MCF-OPH — Food waste from the food services program is sent to Stratton Farms for livestock food. The program was started in 1998 and is expected to continue indefinitely. Two barrels of kitchen grease, bone, and tallow are picked up monthly by Mengelkoch at an annual cost of approximately $315. The program has saved waste disposal costs.

MCF-RC — Food waste from food services program is sent to Stratton Farms for livestock food.

MCF-STW — Food waste from food services program is sent to Stratton Farms for livestock food.

MCF-WL — Willow River installed a new higher efficiency furnace and hot water system in its kitchen, which will provide savings in natural gas use.

Office of Environmental Assistance — In February 2001 the OEA started an experimental worm bin. The goals were to create a bin that was inexpensive, easy to maintain, and would recycle a substantial amount of food waste from the office. Warren Wilson, from Dakota County, donated a pound of worms to the office for the bin; and the other materials, bin, trowel, dirt, and chicken wire cost the office about $10.

The bin has been maintained for over a year; and we are now tracking how much waste we are able to divert from the trash. On average, the worms consume two to three pounds per week. They are easy to maintain; and we have actually been able to give some of our worms to other people who want to give vermiculture a try. The bin has also become a great education tool. Many schools and composters have been taught the easy ways of vermicomposting.

Metropolitan Council – Environmental Services — The central office of the MCES began a demonstration vermicomposting project in the work place in 2001. Using the patented Wriggly Wranch made from recycled plastic as a home, red (earth)worms consume selected food scraps from coffee makers and the lunch room. This successful project has three products—leachate (liquid fertilizer), worm castings (solid fertilizer or potting soil), and more worms! Food resources that would otherwise be disposed of in the solid waste stream or disposed of through a garbage disposal to the treatment plant are being beneficially used.

Pollution Control Agency — The MPCA central office recycled 6,414 pounds of cans, glass, and plastic in fiscal 2001. Several regional MPCA offices have specific reduction programs in effect, including composting food waste, vermi-composting/leachate used as indoor plant fertilizer in office, using refillable soda bottles, promoting paper reduction initiatives, and employee-driven recycling efforts when a recycling hauling contract is not available.

The Minnesota Pollution Control Agency Waste Reduction and Recycling Committee is recognized for maintaining an extensive composting project since September of 1999. The project allows all compostable materials to be collected and managed separately from non-compostable refuse. The material list includes cafeteria food waste, napkins, biodegradable utensils, and paper towels from restrooms. In the first eight months of the program, 28 percent of the solid waste generated was composted. The new Brainerd office is recycling all compostable food wastes to a worm farm!

Department of Transportation — Mn/DOT has developed a hazard assessment procedure for incorporating waste materials into roadway infrastructure. To date Mn/DOT has approved the use of

waste shingles, container glass, and tires (above water) in the infrastructure. Through extensive safety review, Mn/DOT has developed a specification approving the use of all-steel guard rail posts. Steel guard rail posts are recyclable, save installation time and eliminate the disposal and chemical leaching concerns associate with treated woods.

Mn/DOT is constructing salt sheds made of recyclable materials, eliminating the disposal and chemical leaching concerns associate with treated woods. A multidisciplinary team will be formed to determine the chemical composition of all materials going into a roadway, to determine the fate and transport of these chemicals within the road, beneath the road, and through the road base into the surrounding aquatic and terrestrial environment. Mn/DOT recycles approximately 1.5 million tons of asphalt and 2 million tons of concrete annually.

University of Minnesota — In 1999, a small group of faculty, staff, and students started the Sustainable Campus Initiative Committee (http://www.cnr.umn.edu/sci), an ad hoc committee with a mission to use the campus and its physical facilities as a tool for environmental learning. They are currently working on two pilot projects, which will continue through 2001-2002:

1) Restoration of a degraded stream and wetland on the St Paul Campus (http://www.nwf.org/campusecology/newsletter/watershed.html)

2) Development of an environmental performance baseline or "Ecological Footprint" for the Twin Cities Campus (see http://www.bio.psu.edu/Greendestiny/indicators.shtml and http://www.nwf.org/campusecology/index.html).

Through continued student involvement and hands-on projects, they hope to engage students as active citizens of the university. At the same time, they will increase teaching opportunities and achieve a more environmentally sustainable campus.

University research hopes to find ways to plan and manage farm drainage operations in a way that doesn't affect crop yield but does improve water quality. University professor Gary Sands invented a new agriculture drainage calculator that saves users time and headaches through a partnership with Prinsco, Inc., the largest drainage pipe manufacturer in Minnesota. The calculator will help drainage system designers determine the amount of water needed to be drained in a day, based on area size and slope grade. A drainage system is a network of plastic pipes laid beneath the ground's surface to funnel water away from an area. There are millions of feet of drainage pipe in the state, most of it located on southern Minnesota farms. Professor Sands is in the first year of a long-term study that examines the relationship between pipe depth and water quality in agricultural drainage systems. He hypothesizes more shallowly laid pipes will increase water quality by draining less water, thus allowing nitrogen to reach the saturated soil where bacteria will convert it to nitrogen gas. His study might help solve some disputes between farmers and environmentalists by lowering the amounts of nitrogen drained into drinking water without compromising crop yields.

Ever since the earliest settlers staked out their land, farmers in southern Minnesota have depended on artificial drainage systems to rid fields of excess water that prevented optimum crop production. But modern drainage systems are now combined with modern farming practices, which include adding nitrogen to the land to increase productivity. As a result, drained water is carrying high levels of the water-soluble form of nitrogen into the nation's water system. Some surface water contains 15 ppm to 40 ppm of nitrogen. Acceptable drinking water should only contain 10 ppm. Ideally, we can find ways to manage farm operations in a way that doesn't affect yield but does improve water quality. Nitrogen is also the major contributing factor to the spread of hypoxia, oxygen depletion, in nation's waters. Hypoxia occurs in the Gulf of Mexico, at the mouth of the Mississippi River, where aquatic life is severely compromised because of chemical runoff.

Part 4
Matrix of Agencies and Categories

The matrix on the following page shows which agencies provided activity summaries for each category. Each agency addressing a particular category of pollution prevention activities is marked with an ✓ in the row for that category. The categories addressed by each agency or department can be identified by checking the column for that agency or department.

Activity Type	Department of Administration	Department of Agriculture	Department of Commerce	Department of Corrections	Office of Environmental Assistance	Department of Human Services	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council – Environmental Services	Met Council – Metro Transit	Metropolitan Mosquito Control	Pollution Control Agency	Department of Transportation (MnDOT)	Board of Water & Soil Resources	Educational Institutions	Bemidji State University	Minnesota West Comm & Tech College	North Hennepin Community College	St. Cloud State	Southeast Technical College	University of Minnesota
Absorbents																					
Ongoing	✓			✓				✓	✓	✓			✓						✓		✓
FY01	✓			✓				✓	✓	✓									✓		
Planned	✓			✓																	
Adhesives																					
Ongoing	✓			✓														✓			
FY01	✓			✓														✓			
Planned	✓																				
Air Quality, CFCs																					
Ongoing	✓			✓		✓		✓	✓	✓			✓					✓	✓		✓
FY01	✓			✓				✓	✓	✓								✓	✓		
Planned	✓			✓																	
Antifreeze																					
Ongoing	✓			✓				✓	✓	✓			✓					✓			✓
FY01	✓			✓				✓	✓	✓								✓			
Planned	✓			✓																	
Audits																					
Ongoing	✓			✓				✓	✓		✓		✓			✓			✓		✓
FY01	✓			✓				✓	✓		✓					✓			✓		
Planned	✓			✓				✓								✓					
Automotive Fuels																					
Ongoing	✓		✓	✓				✓			✓		✓			✓		✓	✓		✓
FY01	✓		✓	✓							✓					✓		✓	✓		✓
Planned	✓							✓			✓					✓					
Automotive Maintenance																					
Ongoing	✓							✓	✓		✓		✓					✓	✓		✓
FY01	✓							✓	✓		✓							✓	✓		v
Planned	✓																				
Batteries																					
Ongoing	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓					✓			✓
FY01	✓		✓	✓	✓			✓	✓	✓	✓	✓						✓			✓
Planned	✓			✓	✓							✓									
Cleaning Supplies																					
Ongoing	✓			✓									✓					✓			✓
FY01	✓			✓														✓			✓
Planned	✓		✓																		✓

Activity Type	Department of Administration	Department of Agriculture	Department of Commerce	Department of Corrections	Office of Environmental Assistance	Department of Human Services	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council – Environmental Services	Met Council – Metro Transit	Metropolitan Mosquito Control	Pollution Control Agency	Department of Transportation (MnDOT)	Board of Water & Soil Resources	Educational Institutions	Bemidji State University	Minnesota West Comm & Tech College	North Hennepin Community College	St. Cloud State	Southeast Technical College	University of Minnesota
Commuting and Transportation																					
Ongoing	✓		✓	✓	✓	✓			✓				✓						✓		✓
FY01	✓		✓	✓	✓				✓										✓		✓
Planned	✓				✓																✓
Education, Communication, and Training																					
Ongoing	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓			✓		✓	✓		✓
FY01	✓		✓	✓	✓			✓	✓		✓	✓				✓		✓	✓		✓
Planned	✓				✓							✓									✓
Electronics																					
Ongoing	✓			✓	✓			✓			✓		✓					✓	✓		✓
FY01	✓			✓	✓			✓			✓		✓					✓	✓		✓
Planned	✓			✓	✓						✓										
Energy – Lighting																					
Ongoing	✓			✓	✓			✓	✓			✓	✓			✓		✓	✓		✓
FY01	✓			✓	✓			✓	✓			✓				✓		✓	✓		✓
Planned	✓		✓	✓	✓							✓									
Energy – Production																					
Ongoing	✓			✓	✓				✓				✓					✓			✓
FY01	✓			✓	✓				✓									✓			
Planned	✓		✓		✓																✓
Groundwater Wells																					
Ongoing	✓		✓	✓					✓				✓					✓			
FY01	✓		✓	✓					✓									✓			
Planned	✓			✓																	
Heavy Metals																					
Ongoing	✓	✓		✓	✓				✓				✓					✓	✓		✓
FY01	✓			✓	✓				✓									✓	✓		✓
Planned	✓			✓	✓																
HVAC, Indoor Air Quality																					
Ongoing	✓			✓				✓		✓						✓		✓	✓		✓
FY01	✓			✓				✓		✓						✓		✓	✓		✓
Planned	✓			✓						✓											✓
Ice Control, Sanding																					
Ongoing	✓			✓		✓		✓		✓			✓					✓	✓		✓
FY01	✓			✓				✓		✓			✓					✓	✓		
Planned	✓			✓						✓			✓								

Activity Type	Department of Administration	Department of Agriculture	Department of Commerce	Department of Corrections	Office of Environmental Assistance	Department of Human Services	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council – Environmental Services	Met Council – Metro Transit	Metropolitan Mosquito Control	Pollution Control Agency	Department of Transportation (MnDOT)	Board of Water & Soil Resources	Educational Institutions	Bemidji State University	Minnesota West Comm & Tech College	North Hennepin Community College	St. Cloud State	Southeast Technical College	University of Minnesota
Laboratory																					
Ongoing		✓		✓					✓		✓		✓			✓		✓	✓		✓
FY01	✓			✓					✓		✓					✓		✓	✓		
Planned				✓																	
Landscaping																					
Ongoing			✓	✓									✓			✓					✓
FY01				✓												✓					✓
Planned				✓												✓					✓
Materials Exchange																					
Ongoing	✓			✓	✓			✓										✓	✓		✓
FY01	✓			✓	✓			✓										✓	✓		
Planned	✓			✓	✓																
Office Supplies																					
Ongoing	✓	✓		✓	✓			✓	✓		✓					✓		✓	✓		
FY01	✓			✓	✓			✓	✓		✓					✓		✓	✓		
Planned	✓			✓	✓																
Oil, Oil Filters																					
Ongoing	✓			✓				✓	✓	✓	✓		✓					✓	✓		✓
FY01	✓			✓				✓	✓	✓	✓							✓	✓		
Planned	✓		✓	✓																	
Paints, Coatings, Stripping																					
Ongoing	✓			✓		✓		✓	✓				✓			✓		✓	✓		✓
FY01	✓			✓				✓	✓							✓		✓	✓		
Planned	✓			✓																	
Parts Cleaning																					
Ongoing	✓			✓				✓	✓				✓						✓		✓
FY01	✓			✓				✓	✓										✓		
Planned	✓			✓				✓													
Personal Care																					
Ongoing						✓															
FY01																					
Planned																					
Pesticides, Fertilizers																					
Ongoing	✓	✓		✓		✓					✓		✓					✓			✓
FY01	✓			✓							✓							✓			
Planned	✓			✓																	

Activity Type	Department of Administration	Department of Agriculture	Department of Commerce	Department of Corrections	Office of Environmental Assistance	Department of Human Services	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council – Environmental Services	Met Council – Metro Transit	Metropolitan Mosquito Control	Pollution Control Agency	Department of Transportation (MnDOT)	Board of Water & Soil Resources	Educational Institutions	Bemidji State University	Minnesota West Comm & Tech College	North Hennepin Community College	St. Cloud State	Southeast Technical College	University of Minnesota
Policy Statement																					
Ongoing	✓	✓		✓	✓			✓	✓		✓		✓					✓			✓
FY01	✓			✓	✓			✓	✓		✓		✓					✓			
Planned	✓			✓	✓																
Printing																					
Ongoing	✓		✓	✓	✓			✓			✓	✓	✓					✓	✓		✓
FY01	✓			✓	✓						✓	✓	✓					✓	✓		✓
Planned	✓				✓							✓	✓								✓
Procurement																					
Ongoing	✓	✓		✓	✓			✓	✓		✓		✓			✓		✓	✓		✓
FY01	✓			✓	✓			✓	✓		✓					✓		✓	✓		✓
Planned	✓			✓	✓																✓
Remanufactured Parts																					
Ongoing	✓			✓				✓										✓	✓		
FY01	✓			✓				✓										✓	✓		
Planned	✓			✓																	
Tanks																					
Ongoing	✓			✓				✓	✓				✓			✓		✓	✓		✓
FY01	✓			✓				✓	✓							✓		✓	✓		✓
Planned	✓			✓												✓					
Technical Support																					
Ongoing	✓		✓	✓	✓			✓	✓				✓					✓			✓
FY01	✓		✓	✓	✓			✓	✓									✓			✓
Planned	✓			✓	✓																
Tires																					
Ongoing	✓			✓				✓	✓				✓					✓	✓		
FY01	✓			✓				✓	✓				✓					✓	✓		
Planned	✓			✓																	
Water Treatment and Conservation																					
Ongoing	✓			✓	✓			✓	✓				✓					✓	✓		
FY01	✓			✓	✓			✓	✓				✓					✓	✓		
Planned	✓			✓	✓																
Other																					
Ongoing	✓			✓	✓				✓			✓	✓								✓
FY01	✓			✓	✓				✓			✓									✓
Planned	✓			✓	✓							✓									✓