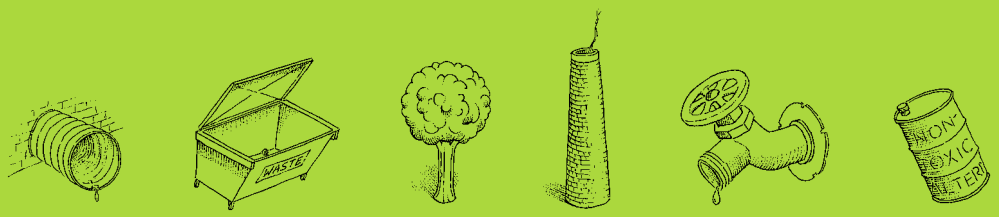
INTERAGENCY POLLUTION PREVENTION ADVISORY TEAM [IPPAT]



Pollution Prevention Summary Report

Consolidated from reports submitted by members of the Interagency Pollution Prevention Advisory Team for the fiscal year 2005

July 2006

POLLUTION PREVENTION
Right From The Start

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Introduction

The Pollution Prevention Summary Report is a consolidation of the summary reports on pollution prevention activities for the fiscal year 2005, submitted by participating Minnesota state agencies.

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 by state government. Agency contacts are listed on the inside front cover.

Organization of the report

This report is divided into five parts:

- Description of each agency, including the number of employees, locations of the agencies, and pollution prevention training held during the last year.
- Summary of each agency's policy and regulatory activities that have incorporated pollution prevention in its broader sense.
- Measurements for activities satisfying Executive Order 04-08.
- Summary of 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.
- 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.

An original signed copy of each agency's report is on file at the Minnesota Pollution Control Agency. For more information, contact Emily Moore at 651-215-0201 or toll-free at 800-657-3843.

Part 1
Agency Descriptions

Part 1 includes general information about the participating agencies, including size of staff, the number of locations, and the amount of pollution prevention training that staff has had during fiscal year 2005.

Department of Administration (Admin) – The mission of the Department of Administration is "to improve the quality and productivity of Minnesota government." The department provides a diverse range of business management, administrative, technological, and professional services, as well as a variety of resources to state and local government agencies and to the public. With 17 distinct business units and about 490 employees, the department strives to address the needs of government and citizens, from managing state-owned buildings and grounds to establishing statewide technology policy. Throughout its daily and strategic work, the department is committed to offering the best possible service, enabling state government to work more efficiently.

Admin's Materials Management Division (MMD) and Plant Management Division's Resource Recovery Office (RRO) incorporate pollution prevention in their service to state and local agencies and in outreach through the State Resource Recovery Program. The Resource Recovery Program 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 operation of 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. The purpose of the program is to "promote the reduction of waste generated by state agencies, separate and recover recyclable and reusable commodities, procure recyclable commodities and commodities containing recycled materials, and uniformly dispose of recovered materials and surplus property" as set forth in Minn. Stat. § 115A.15, subd. 1. Admin's outstanding customer service has earned the department eight environmental awards and two scholarships in the last three years.

Admin communicates environmental and other information through the following Internet sites: http://www.admin.state.mn.us/, http://www.rro.state.mn.us, and http://www.mmd.admin.state.mn.us/.

Department of Agriculture (MDA) – The Minnesota Department of Agriculture currently employs 404 peoplel. There are 20 different MDA facilities located throughout the state. This report is primarily for the St. Paul office complex located at 90 West Plato Boulevard.

Bemidji State University (BSU) – Bemidji State University includes two locations: the BSU main campus and the Center for Research and Innovation. This summary reports on both locations. BSU employs approximately 550 faculty and staff, and 645 student employees. A member of our Logistical Services Department participated in Energy Star training, which included a tutorial on the Energy Star website and FEMP site.

Department of Commerce – The department employs 323 staff in downtown Saint Paul (primary), Roseville, and field locations. This report covers the department as a whole. Department of Commerce staff has not received any pollution prevention training during the past year.

Department of Corrections (DOC) – This pollution prevention summary report contains information from fiscal year 2005 for the Department of Corrections. The DOC has approximately 3,900 employees working in 10 juvenile and adult facilities, field offices, a central office, and MINNCOR Industries. Throughout the year, selected facility staff members within the DOC have received pollution prevention training.

Department of Employee Relations (DOER) – The Minnesota Department of Employee Relations, the state's lead human resource management agency, currently employs approximately 150 personnel at its St. Paul office. No specific pollution prevention training was conducted during FY 2005.

Department of Employment and Economic Development (DEED) – DEED has approximately 1,700 employees working in 53 staffed facility locations. This report includes information for our whole agency. DEED staff has not received any P2 training during the past year.

Office of Environmental Assistance (OEA) – The Office of Environmental Assistance 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 54 people in the St. Paul office and 10 staff in regional offices to provide local government assistance and environmental education assistance. 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. The OEA provides funding for the Minnesota Technical Assistance Program (MnTAP), which helps Minnesota businesses develop and implement solutions to maximize resource efficiency, prevent pollution, and reduce costs. Established in 1984, MnTAP is funded primarily through a grant from the Office of Environmental Assistance to the University of Minnesota, School of Public Health, Environmental and Health Sciences Division. MnTAP provides free technical assistance tailored to business needs. By reducing waste and energy use and increasing efficiency, businesses can save on disposal and raw material costs, and decrease regulatory compliance burdens. Businesses can also maintain healthier and safer working conditions for employees.

Iron Range Resources and Rehabilitation Agency (IRRR) – The IRRR is a state agency that strives to enhance the economic vitality of the Taconite Assistance Area through value-driven, cost-effective projects and programs designed for the long-range benefit of the area. The agency goals are to:

- position the agency to be a leader in developing and implementing a strategy for the long-term economic viability of the northeastern Minnesota region.
- sustain the region's economic base by working with existing businesses to retain existing jobs and expand to create new jobs.
- diversify the region's economy by growing new businesses and recruiting expanding businesses from outside the area.
- reclaim mining impacted lands to create a diverse regional economic development resource.

The agency complement, including all departments and locations, is 67 employees as of August 1, 2005, down six employees from fiscal year 2004. These employees staff three facilities owned and operated by IRRR. The main administration building is located two miles south of Eveleth on Highway 53. This building provides office space for Accounting, Administrative Services, Development Strategies, Marketing, Communication and External Affairs, Mining and Natural Resources, Purchasing, Shop, and Tourism.

The second facility, Ironworld Discovery Center, is located on the edge of Glen Mine in the heart of the Iron Range. Ironworld Discovery Center preserves and presents northeastern Minnesota's iron mining and immigration history. Ironworld Discovery Center interprets the life, the work, and the cultural traditions that emerged on the Iron Range during this period of immigration. An integral part of Ironworld Discovery Center is the Iron Range Research Center, which is a public records repository and resource for historical documentation and interpretative information. Primary interest areas are geology, mining, settlement, industrial development, immigration, ethnicity, logging, natural resources, social, political, and economic history, and genealogy. The research center focuses on the regional, local, and personal history of Minnesota's iron ranges and the people who settled there. Ironworld's park and museum are open from May to September. The research center is open year-round.

Planting trees to improve the environment

Ironworld is also home to the IRRR's Mineland Reclamation Division, which undertakes safety, environmental, and economic development projects on abandoned minelands of the pre-taconite era, often in cooperation with adjacent communities. This year, IRRR Mineland Reclamation grew 300,000 containerized seedlings in an on-site growth chamber. The seedlings were planted on the Mesabi, Vermilion, and Cuyuna iron ranges.

Although most of our seedlings are planted on former mining ranges, the benefits concerning energy conservation through trees should be mentioned. In Minnesota, strategically placed shade trees can reduce air conditioning bills up to 20 percent. Also, trees throughout the community (our community forest) cool us in the summer (thereby reducing air pollution) and they shelter us from harsh winter winds. In order to achieve these savings and benefits, trees should be properly located.

Since Minnesotans typically spend 10 times more to heat than to cool their homes, providing shade for east and west windows is the most effective way to reduce air conditioning use. Select trees that can be planted within 20 feet of a window and will grow at least 10 feet taller than the window. Select a tree with dense foliage, as broad in form as space permits. Avoid shading south windows. If you do want a tree in the southeast or southwest window, use a "solar friendly" tree that has moderately dense foliage during the hottest times of year, looses its leaves early in the fall as the heating season begins, and has sparse winter branches.

With Minnesota winters long and windy, the most valuable way to reduce annual energy use is to create windbreaks. Tall trees will guide wind up and over an area to a point downward at least 10 times the height of the windbreak. To create a windbreak, plant rows or continuous clusters of evergreen trees perpendicular to the primary wind direction, which usually runs along the west and north sides of the property. In winter, northwesterly winds cause the most heat loss.

Tree facts: Saving energy and preventing pollution

- An average tree absorbs 13 pounds of carbon annually.
- The production of one ton of wood removes 1.47 tons of atmospheric carbon and releases 1.07 tons of oxygen.
- A mature tree absorbs 120 to 240 pounds of small particles and gases per year.
- One tree produces three quarters of the oxygen needed by an adult human.
- 25,000 acres of forest offset the emissions of 10 billion automobile miles.
- Windbreaks reduce winter heating costs by as much as 5 to 20 percent.
- Wooded areas decrease runoff by 5 to 35 percent and increase percolation and infiltration.

The third facility is Giants Ridge Golf and Ski Resort located near Biwabik, Minnesota. Giants Ridge is one of the Midwest's most popular four-season resort destinations, committed to providing guests with premier recreational experiences through first-class customer service. The facility also plays an integral role in the area's economic development.

The resort offers guests two championship 18-hole golf courses, the Legend and the Quarry. These golf courses hosted 35,000 golfers last year and were named "the best new upscale public golf course in the nation" by *Golf Digest* in 2005. The resort's ski area is ranked third in the Midwest and first in Minnesota and features 34 alpine ski runs; 70 kilometers of groomed cross country ski trails; the Midwest's best snowboard terrain park. Approximately 100,000 skiers hit the slopes and cross-country trails in 2005. The resort offers easy access to thousands of groomed snowmobile trails; hiking, biking and canoeing; an 18-hole disc golf course; a variety of quality lodging choices on site and in the surrounding area; great food; special events; and entertainment.

Metropolitan Airports Commission (MAC) – The Minnesota Legislature created the Metropolitan Airports Commission in 1943 as a public corporation whose mission is 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 (13 are appointed by the governor and the other two are the mayors of Minneapolis and St. Paul or their designees).

MAC currently 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 2004, MSP serviced more than 36 million passengers and supported 541,000 flight operations. The reliever airport system supports more than 630,000 flight operations per year.

MAC presently employs 548 people 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** includes Ground Transportation, the Airport Directors 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, Information Systems, Public Affairs, and Purchasing.

This summary will constitute a report for the agency as a whole. Staffed facility locations include the Lindbergh and Humphrey Terminals at MSP International, as well as Maintenance, Trades, and two administrative locations. The MAC continually reevaluates and updates all pollution prevention methods and practices. Communication and topic-specific training is ongoing.

Metropolitan Council Environmental Services (MCES) – The Metropolitan Council Environmental Services is a division of the Metropolitan Council, the public agency that coordinates regional planning and guides development in Minnesota's seven-county Twin Cities metropolitan area. The MCES operates the regional wastewater collection and treatment system in most of that same seven-county area. Additional regional environmental responsibilities include industrial wastewater pretreatment and management, air and water quality monitoring, environmental compliance, environmental education, water resources planning, and nonpoint 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 640 staff (full-time equivalent positions). This report describes P2 activities for the entire MCES. A separate report will cover P2 for Metro Transit, the division of the Metropolitan Council that provides public transit, i.e. bus service and a 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. In addition to this professional contact, interagency exchange, and subsequent internal sharing of information, some informal P2 training occurs at the treatment plants related to maintenance, and all employees in the Industrial Waste and Pollution Prevention Section have been trained.

Metropolitan Council Metro Transit – Metro Transit is a division of the Metropolitan Council, the public agency that coordinates regional planning and guides the development in the seven-county metropolitan area. Metro Transit, the major supplier for mass transit in the metropolitan area, operates more than 900 buses over 109 routes. To accomplish this service, Metro Transit operates five service garages, one overhaul facility, one police station, an office building, and a facility maintenance building with a total staff of approximately 2,340 employees. Metro Transit also controls the light-rail system in the Minneapolis area, the Hiawatha Line, which opened fully in December 2004. This added 22 light rail train cars to the fleet inventory plus the buildings and 16 stations that are required to operate the new system.

This report will cover all of the buildings that are operated by Metro Transit during the 2004 calendar year. While Metro Transit is an active member of the Interagency Pollution Prevention Advisory Team, no formal P2 training was conducted by Metro Transit during the past year, but opportunities were given to staff to attend programs put on by other agencies pertaining to P2.

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 to 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 all of its employees and customers.

Metropolitan Mosquito Control District (MMCD) – The Metropolitan Mosquito Control District controls mosquitoes and black flies in the metropolitan counties of Anoka, eastern Carver, Dakota, Hennepin, Ramsey, Scott, and Washington. The district employs 52 full-time staff and approximately 185 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. Additionally, the district owns and operates a small fleet of vehicles. This report covers pollution prevention activities for all the facilities operated by Metropolitan Mosquito Control District for the 2005 fiscal reporting period.

Metropolitan State University – Metropolitan State University has 375 FTE staff and 575 community faculty. We have four locations, three of which are leased space. This report covers the location owned by Metropolitan State. Staff has not received pollution prevention training.

Department of Military Affairs (DMA) – The Department of Military Affairs is composed of the Minnesota Army National Guard (MNARNG) and the Minnesota Air National Guard (MNANG). MNARNG facilities are located throughout the state of Minnesota in approximately 80 locations, including Camp Ripley and the Arden Hills Area Training Site. MNANG has facilities in Duluth (148th Fighter Wing), in Minneapolis (133rd Airlift Wing), and at Camp Ripley. The DMA has approximately 11,000 part-time employees and 2,700 full-time employees, exercising both state and federal missions. This report summarizes the ongoing activities of the DMA throughout the state.

Minnesota Pollution Control Agency (MPCA) – The Minnesota Pollution Control Agency has approximately 750 staff members. They are located in the Central Office in St. Paul and in seven regional offices in Duluth, Brainerd, Detroit Lakes, Mankato, Marshall, Rochester, and Willmar. This report covers all activities of the MPCA statewide.

Some staff has received pollution prevention training, but most have not. The staff has received three types of pollution prevention (P2) training during the past year: the National Pollution Prevention Roundtable Conference, community-based social marketing, and performance measurement and program evaluation, which are discussed elsewhere in this report. Performance measurement and performance evaluation involved project managers learning and applying systematic and holistic project design.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Alexandria Technical College (ATC) employs approximately 250 faculty and staff members at seven staffed buildings in two locations: the main campus and also the Interior Design facility, which is located off campus. The campus consists of, including the off campus Interior Design facility. For purposes of this report, all buildings shall be considered. Members of the ATC staff receive yearly training on hazardous communications and waste management.

Central Lakes College, Brainerd and Staples – Central Lakes College has four campuses in two cities located in central Minnesota: Brainerd and Staples. This report is for all four sites. The college employs approximately 400 full-time and part-time faculty and staff. Staff has not received any formal pollution prevention training.

Dakota County Technical College (DCTC) – Dakota County Technical College employs approximately 250 staff and faculty members, working at four sites. We are reporting as a whole. None of our staff has received pollution prevention training.

Inver Hills Community College – Inver Hills Community College (IHCC) employs more than 300 employees. The campus has only one facility location, and this report is for IHCC specifically. IHCC employees have received pollution prevention training facilitated by McNeil Environmental, Inc.

Mesabi Range Community and Technical College – Mesabi Range College employs 144 staff at four facility locations. This report is submitted for the college as a whole. The college staff has received no pollution prevention Training.

Metropolitan State University – Metropolitan State University has 375 FTE staff and 575 community faculty at four locations. Three locations are leased space. This report covers only the location owned by Metropolitan State. We have not had any staff members receive pollution prevention training.

Minneapolis Community and Technical College – Minneapolis Community and Technical College (MCTC) employs 800 staff, working at the four sites, including our main campus (Minneapolis), Aviation Center (Eden Prairie), Transportation Center (Minneapolis) and the Center for Criminal Justice and Law Enforcement (St. Paul). Affected staff and faculty have received hazardous waste training and laboratory safety training.

Minnesota State Community and Technical College, Fergus Falls Campus – MSCTC has four campuses. There is also a service center at a separate location. College-wide, there are approximately 375 employees. This report pertains to the Fergus Falls campus.

Minnesota State Community and Technical College, Wadena Campus – Minnesota State Community and Technical College, Wadena Campus, has approximately 70 staff members. We have one facility that is staffed 100 percent at all times, and we have two training locations that are staffed about 65 percent of the time. We are reporting specifically for the Wadena Campus. Staff has not received any training in pollution prevention during FY 2005.

Minnesota State University, Moorhead (MSUM) – Minnesota State University, Moorhead, (MSUM) currently employs approximately 325 full-time faculty, 150 part-time faculty, and 320 staff members. These employees serve more than 7,600 students. MSUM has two facility locations: a 120-acre main campus with 36 buildings, and the Regional Science Center, a 300-acre nature research center located adjacent to Buffalo River State Park. This report reflects both locations and includes all departments within the campus community. Education is ongoing throughout the year for faculty, staff, and students with respect to pollution prevention, waste reduction, and recycling.

Minnesota West Community and Technical College – Minnesota West has approximately 419 staff and faculty working at six campuses and sites. This summary report includes information from all six locations. Staff has not received pollution prevention training this year.

Northland Community and Technical College – Northland Community and Technical College (NCTC) has approximately 400 full-time and part-time staff. There are three staffed facility locations: Thief River Falls campus, the airport campus in Thief River Falls, and the East Grand Forks campus. This report contains information for the college for all three facility locations. NCTC employees have not received pollution prevention training during the past year.

Northwest Technical College, Bemidji – Northwest Technical College (NTC) has approximately 70 staff and faculty that work at two location sites with over 1,000 learners. In 2004, NTC became an independent college and is part of an alliance with Bemidji State University. NTC began as a vocational technical institute in 1965 with two program offerings that have expanded to 45 programs in business, health, industrial arts, and technology.

The NTC main campus is located on 26 acres with a one-story main building of approximately 90,000 square feet and two annex buildings. A new 12,507-square-foot Allied Health addition on the northeast end is slated for completion in 2006, followed by a remodel of 10,500 square feet of vacated space. Project plans are in place for a new 27,500-square-foot two-story technology center on the northwest end of the main building in 2007. The second satellite site is located at the New Beginnings building in Redby, Minnesota, on the Red Lake Indian Reservation. Northwest Technical College does not operate the facility in Redby so this report is covers only the main campus location. We have not received pollution prevention training in the past year.

Pine Technical College, Pine City – Pine Technical College (PTC) is a component of the MnSCU system and employs 81 faculty and staff. It owns and operates only one staffed location at the main campus in Pine City. This report covers that location and therefore the college as a whole. The staff at PTC has not received any pollution prevention training this year.

Ridgewater College – Ridgewater College has approximately 340 full-time, part-time, and seasonal employees at the Willmar and Hutchinson Campuses. Ridgewater College has a campus in Willmar and two locations in Hutchinson. This report represents the efforts of the college as a whole. pollution prevention training has been provided for the grounds crew staff involved in hazardous waste monitoring and disposal.

Riverland Community College, Albert Lea and Austin – Riverland Community College has four campuses in three cities located in southern Minnesota: Albert Lea, Austin, and Owatonna. This report is for all four sites. The college employees approximately 300 full-time and part-time faculty and staff. Staff has not had any formal pollution prevention training.

St. Cloud State University – St. Cloud State University (SCSU) employs approximately 1,500 full- and part-time administrative, teaching, clerical, and technical maintenance personnel. The campus consists of 42 buildings and is situated on more than100 acres. For purposes of this report, all campus locations will be included. Members of the SCSU staff are receiving an increasing level of training in the areas of pollution prevention and recycling. During the past few years, the services of an outside consulting firm, MacNeil Environmental Inc., have been expanded to better address this training issue. They now provide some MS4 information/training, focusing on education about storm water pollution prevention on campus and in cooperation with the city of St. Cloud.

St. Cloud Technical College (SCTC) – St. Cloud Technical College has a staff of approximately 206. This report is for St. Cloud Technical College only. In the past fiscal year, employees who use chemicals have been trained on procedures to follow if a chemical is spilled to prevent release into the environment.

Vermilion Community College (VCC) – Vermilion Community College employs approximately 100 faculty and staff at a single college campus located in Ely. In addition to the main campus facility, the college also has staff and faculty at the TechNorth Prep Center in downtown Ely and an Outdoor Learning Center facility on the shores of Fall Lake, east of Ely. This report encompasses all college locations. VCC staff did not receive pollution prevention training during the past year.

Department of Natural Resources (DNR) – The DNR employs 2,949 staff at 188 locations.

North Hennepin Community College (NHCC) – Approximately 360 staff work at our agency, which has two locations: North Hennepin Community College campus and off-campus classes at Buffalo High School, Buffalo, Minnesota. We are reporting only for North Hennepin Community College campus. pollution prevention training is voluntary on the part of some staff, but is required of Plant Services staff and certain other staff.

Department of Revenue (DOR) – The Department of Revenue has 1,228 full-time and seasonal employees and 30 contractors located in 15 offices: 13 in out-state Minnesota, one in Dallas, one in New York, and 47 home offices located throughout the country. This report covers all DOR facilities. pollution prevention training is designed around the DOR biweekly publication *Revenews.* Each quarter, we put together hints and tips on conserving energy and reducing pollution at home and in the office.

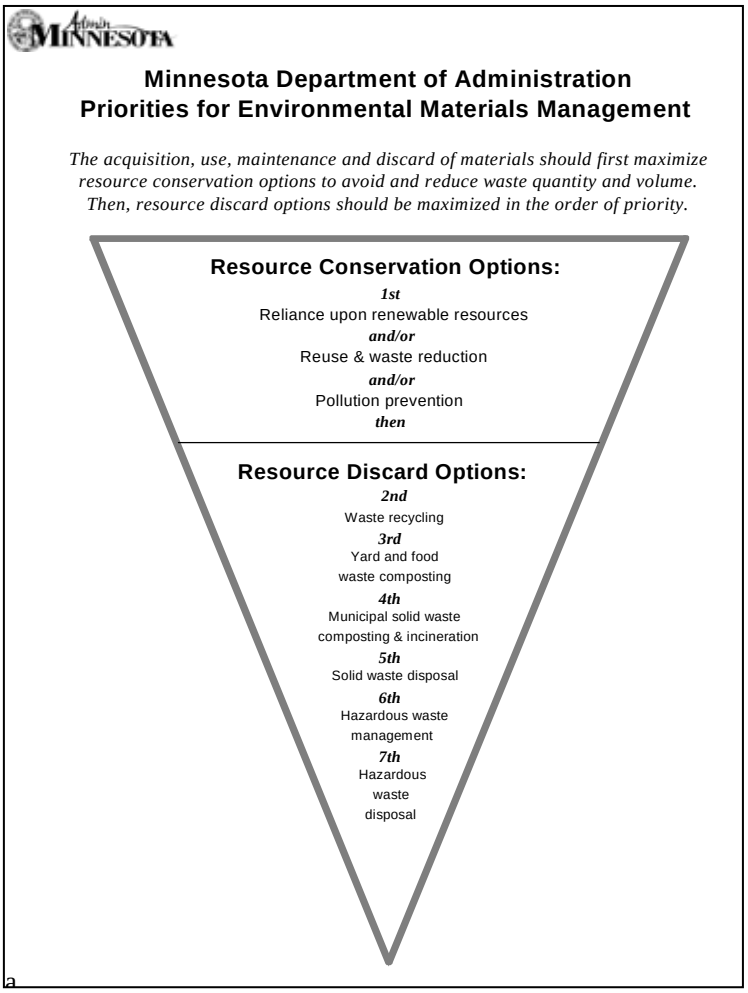
Department of Transportation (Mn/DOT) – The Minnesota Department of Transportation has approximately 5,000 employees. Mn/DOT is a decentralized organization with one central office and eight districts that are subdivided into 16 regions. Mn/DOT has 16 District Management Offices with 135 truck stations, as well as numerous remote salt sheds and gravel pits. The department maintains approximately 12,000 miles of highway and 5,002 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 31,360 employees (including part-time and student employees) and 65,247 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, 18 regional extension centers, extension agents in all 87 counties in Minnesota. The university has approximately 50 U.S. EPA ID numbers for hazardous waste generator sites around the state of Minnesota. Total managed space is 28,588,000 square feet. The university manages 27,500 acres for its campuses and research and outreach centers. 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 (Admin) – Admin's focus on environmental partnerships during the past decade has helped to leverage resources, reduce pollution, and contribute toward a more sustainable quality of life. In its pollution prevention activities, the Department of Administration:



- Treats pollution prevention as a top priority in its "Policy on Environmental Materials Management" and its "Priorities for Environmental Materials Management" (see sidebar), in effect since 1991.
- Resource Recovery Office encourages pollution prevention and promotion of the preferred waste management practices contained in Minnesota Statute § 155A.02 during the acquisition, use, maintenance, and disposal of materials.
- Plant Management Division's mission statement encompasses pollution prevention and other environmental concepts (see next page).
- The Plant Management Division and Materials Management Division requires that each employee be held individually accountable for achieving environmental stewardship as a function of his/her job responsibilities and as a fulfillment of his/her position description. Employees are to follow state and federal requirements and shall identify opportunities to implement environmental values.
- Employees of the division are directed to use resource conservation and pollution prevention practices in the maintenance of buildings and grounds, in support operations, and during their daily service to customers.
- The Plant Management Division includes language in lease agreements to provide both purge days and coordination services for each building on the Capitol Complex. This annual activity promotes recycling, reuse, and the correct disposal of hazardous materials.
- Materials Management Division requires that vendors provide environmental codes on the goods and services they make available for state purchase.
- The State Architect's Office publishes and maintains "Sustainable Design Guidelines" for use on state construction projects.

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, and knowledge.

Responsiveness to our customer needs through communication, efficiency, and timeliness.

Provide quality work through modern technology and employee training.

Responsible business practices that encourage professionalism, cost effectiveness, and open communication.

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

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

Created 1/92

Department of Agriculture (MDA) – MDA's 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, the division looks for alternative methods that will help reduce its hazardous waste.

The Department of Agriculture 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. The Bio-diesel Task Force continually works to accelerate the development of Minnesota's bio-diesel industry. To learn more about this new alternative fuel, go to the MDA's website at www.mnda.state.mn.us.

The department has sent communication to all of the purchasing agents in our divisions instructing them to purchase Energy Star-rated electronic office equipment and appliances whenever possible. Our agency instructs employees to procure products with the lowest potential to contribute to air pollution whenever possible. The department has also sent out MPCA guidance on exactly how to comply with these directives. The department continually uses both electronic communication and teleconferencing to communicate with its clients.

Bemidji State University (BSU) –Bemidji State University's environmental policy (http://www.bemidjistate.edu/ehs/PDF FILES/envpolicystatement.pdf) states, in part:

In our general operations, Bemidji State University will strive, wherever possible, to:

- conserve natural resources and support sustainable practices,

- conduct affairs in ways which safeguard the environmental health and safety of students, faculty, staff, and members of the broader community,
- reduce the generation of wastes and the use of toxic substances and promote strategies to reuse and recycle those wastes which cannot be avoided; and purchase renewable, reusable, recyclable, and recycled materials.

In pursuing our educational and research missions, Bemidji State University will strive, wherever possible, to:

- foster an understanding of and responsibility for the natural environment,
- convey knowledge regarding environmental and health issues relevant to various academic disciplines,
- encourage environmental research,
- conduct teaching and research in an environmentally responsible way,
- provide a forum for the open flow of information within the university community and the community at large regarding environmental issues and their relationships to other social issues.

BSU President Jon Quistgaard affirmed the university's commitment to protecting the environment by signing the Talloires Declaration (http://www.ulsf.org/programs_talloires.html) during a public signing ceremony on February 16, 2005. The signing represents not only a formal pledge by the university to continue to pursue an environmental agenda, but also an opportunity for the community and all members of the university to be involved.

Department of Commerce

Automotive fuels: The department actively promotes the use of E85 with funding and informational materials, education efforts, and staff support.

E85 FUELING STATIONS AND CONSUMPTION DATA

Year	Number of stations at year's-end	Total yearly volume (in gallons)	Monthly average (in gallons)
1997	11	5,933	225
1998	12	37,521	288
1999	17	74,959	583
2000	56	301,152	780
2001	65	706,228	965
2002	70	1,262,318	1,479
2003	85	2,611,218	2,270
2004	101	1,434,202	2,267
2005*	152	5,461,808	4,463

* through August 2005

Education, communications, and training: The department operates the Energy Information Center, which is staffed by full-time energy specialists who answer consumer inquiries and who staff outreach events.

ENERGY INFORMATION CENTER CONTACTS (FY 2000-2003)

	2001	2002	2003
Contacts*	60,000	61,000	63,000
Printed	240,000	200,000	127,000
Website	unavailable	unavailable	94,000
CDs	31,000	40,000	unavailable

*phone, in-person, e-mail responses

Energy Production–Solar Electric Rebate Program: The department received competitive funding for and operates the Minnesota Solar Electric Rebate Program, which offers about a 20 to 25 percent buy-down on grid-connected solar electric systems.

MINNESOTA SOLAR ELECTRIC REBATE PROGRAM RESULTS (KILOWATTS)

	FY 2003	FY 2004	FY 2005	FY 2006	Pending
Annual	13	50	104	10	69
Cumulative	13	63	167	177	246

Legislative Commission on Minnesota Resources (LCMR) funding: The department was awarded a $300,000 LCMR FY 2004-2005 grant to implement a Community Wind Rebate Program for two utility-scale wind turbine in communities outside of southwest Minnesota. Carleton College and the University of Minnesota-Morris both constructed a 1.65 MW wind turbine, completed in FY 2005.

Conservation Improvement Programs–Electric and Natural Gas: The department oversees utility investment in energy conservation and demand-side management through implementation of Conservation Improvement Programs (CIP). All electric and natural gas utilities are required to invest a small percentage of their gross operating revenue in energy conservation programs.

ENERGY CONSERVATION AND AVOIDED EMISSIONS THROUGH CIP (INVESTOR-OWNED UTILITIES ONLY)

	2001	2002	2003	2004*	2005*
Electricity (kWh)	323,267,204	361,774,831	403,570,318	268,998,041	265,217,560
Natural gas (mcf)	1,527,548	1,338,796	1,781,059	1,294,389	1,284,108
CO_2 (tons)	357,190	377,384	438,326	298,630	294,909
SO_2 (tons)	805	901	1,005	670	661
NOx (tons)	637	713	795	529	522
Mercury (lbs)	9	10	11	7	7

* Note: Estimated/approved amounts during regulatory process. Actual amounts are generally higher.
CO_2 = carbon dioxide, SO_2 = sulfur dioxide, NOx = nitrogen dioxides

Tanks: The Minnesota Petrofund Program, housed at the Department of Commerce, provides a reimbursement mechanism to help businesses and citizens clean up areas where petroleum leakage has occurred.

MINNESOTA PETROFUND APPLICATIONS AND FUNDING

	2001	2002	2003	2004	2005
Applications approved	1,630	1,204	1,699	1,575	1,541
Funding approved (millions)	$13.1	$10.6	$16.6	$14.6	$13.1

Department of Corrections (DOC) – The following is taken from the DOC policy manual (*DOC Policy – 100.010: Mission, Philosophy, and Vision of the Department of Corrections*):

Mission Statement: To develop, provide, and promote effective correctional practices that contribute to a safer Minnesota.

Values

- Respect: We value every individual and recognize the need for respect and fairness.
- Ability to grow and change: We affirm and support every individual's ability to change.
- Healing and restoring relationships: We believe in restoring individual and community relationships.

- Staff as our most valuable resource: We are committed to the personal/professional growth of our staff in an inclusive, safe, and healthy environment.
- Open, two-way communication: We support sharing information and responsive listening through clear, accessible forms of communication.
- Leadership through partnership: We believe in leading by example, shared decision-making, partnerships, and teamwork.

Goals

- Humane/safe environment for staff and offenders.
- Offender accountability.
- Community safety through shared responsibility.
- Operational effectiveness.
- Sound public policy.

The mission, goals, and values listed above demonstrate the department's commitment to being a good neighbor and protecting our staff, offenders, and community. Sound environmental, health, and safety practices contribute to these ideals.

DOC policies are in place to help reduce pollution in the areas of alternative fuel vehicle procurement and telecommuting. Department purchasing policy states: "The Travel Management Division of the Minnesota Department of Administration can help answer questions related to State of Minnesota and/or U.S. EPA act requirements regarding vehicle acquisition." In addition, the policy references the Minnesota State Statute regarding the purchasing of fuel and vehicles by state agencies. Further, DOC policy 103.235, *Telecommuting*, lists pollution prevention as one element in the decision-making process.

DOC facilities continue to work with county hazardous waste inspectors, hazardous waste contractors, state agencies, vendors, and all of our employees to reduce the hazardous waste generated at facilities. Inspections and audits are a regular activity undertaken as a result of these partnerships.

Department of Employee Relations (DOER) – DOER has expanded the use of web-based training/meetings through the use of WebEx, which allows state Human Resources personnel to attend training sessions from their own desk, reducing the amount of miles driven by employees annually.

DOER administers the Transit Expense Accounts program that allows employees to pay for out-of-pocket bus pass or van pool expenses on a pretax basis.

Department of Employment and Economic Development (DEED) – The following changes were made to our policies and procedures manual to promote pollution prevention efforts within our agency:

1. PPM312 Authority for Local Purchase–Buying Contract Items: Consideration should be given to the purchasing of energy-efficient, Energy Star-rated office equipment.

2. PPM341 Travel Expenses–fuel: E85 will be used in flex-fuel vehicles when it is reasonably available and the price is comparable to gasoline. For all other gasoline-powered vehicles owned by DEED, it is recommended that the cleanest fuel available be purchased, e.g. Blue Planet® gasoline.

Office of Environmental Assistance (OEA) – The OEA concentrates on pollution prevention policy and outreach. MnTAP focuses the vast majority of their 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 are available that expand our original "pollution prevention vision," including environmentally preferable purchasing, green buildings, design for the environment, and

Environmental Management Systems. OEA programs promote all these initiatives. MnTAP also uses all these tools in their assistance to Minnesota businesses. With help from MnTAP services over the last year, companies have eliminated 10.4 million pounds of waste, resulting in company savings of $2.2 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 to 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.

OEA's Strategic Plan contains goals and strategies for driving changes in policies and practices within all Minnesota sectors that result in pollution prevention throughout the state. Relevant excerpts from that plan are:

VISION: Minnesotans prevent pollution and reduce toxic products and materials in our communities.

Goal 1: Reduce and prevent pollution and toxicity.

Goal 1.1. Prevent pollution by changing the way products and services are designed, manufactured, and delivered.

Strategies: Technical assistance
Financial assistance
Design for the Environment

Goal 1. 2. Minnesotans use nontoxic and environmentally preferable products and properly manage products with hazardous constituents.

Strategies: Education campaign
Environmentally preferable purchasing
Technical and financial assistance

Goal 1.3: Reduce air toxics, ozone precursors, and greenhouse gases emitted to the environment.

Strategies: Clean Air Minnesota partnership to reduce emissions of ozone precursors, including VOCs, NOx, and other pollutants.
Green energy: Increase the use of renewable energy and cleaner energy technologies in fuel and electricity use in Minnesota.

VISION: We conserve resources and minimize waste.

Goal 2: Minnesotans use materials, products, and services in a manner that conserves resources and minimizes waste generation.

Goal 2.1: Improve and support integrated waste management systems while reducing waste and conserving resources.

Strategies: Organics reuse/recycling. Encourage the recovery of food for reuse by people or livestock and build additional resource recovery capacity for organic materials as needed.
Regional planning: Support planning and institutional development; emphasize regional strategies.
Market development: Build markets for recycled and reused materials; build markets for compost use to increase recovery of organics and improve techniques for storm water management and erosion control.
Education campaigns
Targeted technical and financial assistance: Work with local units of government and business to provide efficient, compliant collection of household hazardous waste, waste reduction, waste processing, resource conservation, and to promote markets for recycled materials.

Iron Range Resources and Rehabilitation Agency (IRRR) – The IRRR is committed to policies and practices that will help educate and encourage employees to continually strive for the prevention of pollution and conservation of energy and environmental resources. The common sense approach to achieve attainable goals has been working very well at the agency. Tips regarding pollution prevention are included from time to time in the *Weekly Resourcer*, the agency's online employee newsletter. IRRR is committed to keeping northeastern Minnesota safe and healthy by encouraging its employees to:

- remain informed of environmental regulations.
- share environmentally friendly ideas that support pollution prevention.
- demonstrate that pollution prevention must be a shared goal among government, communities, and individuals.

Metropolitan Airports Commission (MAC) – The Metropolitan Airports Commission recognizes pollution prevention as an integral part of its services. The 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. We encourage our tenants to do the same. The MAC also promotes taking a proactive approach to environmental protection and supports cooperation with other regulatory agencies.

Purchasing/procurement. Several MAC purchasing policies have been effective in preventing pollution. Product reuse is promoted internally through a purchasing policy, including a procedure for disposing of property that the MAC no longer needs. Internal notices are distributed offering one department's surplus to another. This strategy not only reduces waste, it also holds down costs. An office supply surplus center has also been established providing a location to store surplus office supplies. These excess supplies are available to any employee for use at the MAC.

Surplus equipment and lost-and-found items were previously sold by mailing lengthy descriptions, bid sheets, and terms and conditions to numerous recipients on a mailing list. Now these items are sold through the Internet and e-mail. This allows the MAC to reach more potential bidders and eliminates the large and frequent mailings, thereby reducing paper usage.

Technology and accepted practices. Use of electronic mail for notices such as job postings, organizational updates, press releases, and human resource announcements has helped reduce the amount of paper used throughout the organization.

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, the MAC works on an ongoing basis with the Minnesota Pollution Control Agency and the Minnesota Department of Health to help the reliever airport tenants to maintain or obtain compliance with existing regulations associated with their lease space activities. The MAC also uses the services of the Metropolitan Council Environmental Services for treating glycol-impacted storm water.

Metropolitan Council Environmental Services (MCES) – The council promotes activities and outcomes that are sustainable in development, transportation, affordable housing, and the environment. This is accomplished largely by 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) that 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 Section (IWPPS) controls the use of the public sewer system—largely by the implementation of wastewater pre-treatment standards—in order to ensure compliance with local, state, and federal water quality regulations. See categories 11, 16, and 33 in Part 4 of this report for a complete description of the many activities of IWPPS that are relevant to pollution prevention.

Metropolitan Council Metro Transit – The council promotes activities and outcomes that are sustainable in development, transportation, affordable housing, and the environment. This is accomplished largely by policies, partnerships, and grants, and providing information and technical assistance to local communities and governmental bodies, not by enforcement.

The 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. Metro Transit does not have any regulatory activities.

Metropolitan Mosquito Control District (MMC) – 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, we can improve the quality of the environment we live in and maintain a safe, healthy workplace for our employees.

Environmental protection is everyone's responsibility. The MMCD is committed to being a good neighbor and operates 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.

Department of Military Affairs (DMA) – The Department of Military Affairs' vision is to lead the way in protecting and enhancing our natural and cultural resources while maintaining the highest degree of military readiness. The DMA is committed to ISO 14001, Environmental Management System (EMS). The DMA will utilize effective partnerships both within and outside the organization to show continual improvement; develop innovative solutions; to obtain command, soldier, and regulator "buy in;" and to promote success in sustaining compliance with all regulatory requirements. The DMA uses EMS to accomplish the following:

- support the Army transformation
- ensure the viability of training areas
- promote sustainable operations
- reduce overall costs

Minnesota Pollution Control Agency (MPCA) – Several projects spearheaded by the Minnesota Pollution Control Agency use the regulatory process, applying prevention and other nontraditional regulatory approaches that can help achieve the MPCA's core regulatory functions. In partnership, staff and leadership from the MPCA media programs and their external partners identified, designed, and are now implementing eight pilot projects as part of the Pollution Prevention Tools Initiative. The appropriateness and effectiveness of prevention and other nontraditional tools in achieving the core regulatory functions, including our capacity and ability to track pollution prevention results, will be explored through this critical mass of projects. The projects are unique in their application of a Logic Model Program Evaluation Tool and Community-Based Social

Marketing Tools, which are both systematic project management tools aimed at ensuring better measurement, documentation of results, and commitment to more environmentally friendly behaviors.

Pollution Prevention Tools Initiative: Effectiveness and Appropriateness of Prevention in Regulatory Programs. The Prevention and Assistance Division continued to collect qualitative data from, and began to define quantitative data for, the Pollution Prevention Tools Initiative. The I\initiative consists of eight projects designed to shed light on the MPCA's ability to integrate prevention and other alternative environmental protection approaches into traditional regulatory programs effectively and appropriately. In the past, collecting this type of data from isolated and uncoordinated projects prohibited such assessments. The projects include a construction storm water compliance calendar; conservation design toolkit; feedlot environmental results program; multimedia pollution prevention inspections; and a low impact development (LID) and model ordinance technical assistance and outreach.

Construction Storm Water Compliance Calendar. The construction storm water compliance calendar promotes regulatory compliance while educating about infiltration/filtration and low impact development approaches. It partners the MPCA's Small Business Assistance Program with local jurisdictions and external technical assistance providers on Storm Water Program Issues.

Conservation Design Toolkit. The conservation design toolkit is web-based guidance for builders and developers regarding low impact development and other storm water management practices targeted to the North Shore of Lake Superior. It partners the MPCA's storm water and environmental management assistance programs with the University of Duluth-Natural Resources Research Institute and local technical assistance providers and jurisdictions.

Feedlot Environmental Results Program. The feedlot environmental results program is a self-assessment program for smaller dairy feedlots to address regulatory compliance and promote stewardship activities associated with whole-farm management. It partners the MPCA's feedlot and environmental assistance programs with local jurisdictions and industry trade associations. Current partners are the Milk Producers Association and the MPCA Feedlot Program.

Multimedia Pollution Prevention Inspections Program. The multimedia pollution prevention inspections program allows inspectors to cover the requirements of their primary program and review those of a second program for referral to program specialists while promoting pollution prevention. It partners the MPCA's enforcement, compliance and environmental management assistance programs with the Minnesota Technical Assistance Program and local jurisdictions.

Low Impact Development (LID) and Model Ordinance Technical Assistance and Outreach Program. The low impact development (LID) and model ordinance technical assistance and outreach program Design Team makes on-site visits, partnering with developers and cities to prepare LID conceptual plans and with counties to update ordinances to include principles of low impact development and conservation design. It partners the MPCA's environmental management assistance program with the Minnesota Erosion Control Association, Project NEMO, and design firms.

Community-Based Social Marketing Projects. In addition to the above five projects, there are three additional community-based social marketing projects, which focus on changing practices:

Storm Water Management for Construction Impacts Program involves outreach and other strategies for contractors/builders, owners/developers, engineers/designers and regulatory personnel to help decrease environmental impact from construction storm water runoff, which are being identified and prioritized for implementation. It partners the MPCA's storm water and environmental management assistance programs with the Builders Association of Twin Cities (BATC), external technical assistance providers, such as the University of Minnesota Extension, various Soil and Water Conservation Districts, and other local jurisdictions.

Red River Basin Vegetative Buffer Technical Assistance Program. In the Red River basin vegetative buffer technical assistance program, the Red River Basin Commission, and local Soil and Water Conservation Districts are assessing current efforts to promote buffers, as a way to increase adoption rate of buffers among farmers and property owners. The MPCA Red River Basin Planner is also involved in the assessment.

Sucker River Watershed Protection Plan. The Sucker River watershed protection plan identifies and prioritizes strategies for residents, property owners and others to adopt for the sake of protecting a high-resource value North Shore watershed. It partners the MPCA's water basin management program and the environmental management assistance program with the South St. Louis Soil and Water Conservation District, MPCA Lake Superior Basin planner, and the Programmatic Work Group (stakeholder).

Positively MN Biz-Nice. Positively MN Biz-Nice is a program initiated through the Governor's Office to promote business development in JOBZ designated areas. In a partnership between the Department of Employment and Economic Development, and other agencies, the Minnesota Pollution Control Agency staff continues to provide technical assistance to businesses interested in sustainable development.

Measurement and Communication Tools and Policy. Historically, the ability of the Minnesota Pollution Control Agency's regulatory programs to measure, track, and report the results of prevention-oriented activities has been lower than its ability to track the control and treatment results. Because prevention results were not being tracked and communicated well, decision-makers and program staff were having difficulty justifying specific prevention goals and activities. Early findings from the Pollution Prevention Tools Initiative provided recommendations for improvements in policy and procedures.

MPCA began the process of developing the guidance, tools, training workshops, and interdisciplinary expertise to ensure adequate tracking, documentation, and communication of prevention results within regulatory programs. The focus will be on the process of project design, identifying performance objectives and measures, and setting quality objectives for data collection, management, and analysis. As a result, in the future, MPCA leadership should be able to more effectively allocate resources to and prioritize projects with prevention goals specifically within programs mandated by the existing environmental statutes. It is being funded through pass-through grants and partnerships, and will be done in conjunction with the Measurement and Communication Tools and Policy. The results are not yet available.

Pass-through Grants and Partnerships. The agency understands the importance of contextualizing prevention goals and results within the regulatory programs, in contrast to prevention efforts unhampered by the constraints of such programs. MPCA targets opportunities for integrating prevention activities into traditional regulatory programs with funds available through its EPA Pollution Prevention Grant award. In addition to the eight Pollution Prevention Tools Initiative projects, these pass-through grants fund a phosphorous management project and a project designed to reduce salt-laden road runoff:

Phosphorous Management Project. The MPCA successfully distributed the Phosphorus Management Plan (PMP) Development Resources packet, finalized in March 2003, through a partnership with Minnesota Technical Assistance Program. The MPCA uses this packet as a compliance tool to assist cities and other Publicly Owned Treatment Works (POTW) operators with reducing phosphorus effluent. The MPCA Water Quality staff is in the process of devising a PMP review checklist based on the PMP template contained in the packet. MnTAP, as a partner, will target POTWs and their industrial users in strategic locations within the Mississippi and Minnesota River Basins to help implement phosphorous and other pollutant reduction plans.

Road Salt Management Project. The MPCA's water basin management programs and the environmental management assistance program are partnering with Fortin Consulting to research the barriers to good road salt management practices among smaller commercial providers. Training is being developed and deployed to specifically overcome these barriers and improve knowledge, skills, and abilities of the personnel involved in road salt application.

The amount of grants are:

- Construction Storm Water Compliance Calendar: $25,000.
- United States Environmental Protection Agency (EPA) for Conservation Design Toolkit: $25,000.
- EPA Innovations for Feedlot Environmental Results Program: unspecified portion of $150,000.
- EPA direct to Minnesota Technology Assistance Program Multimedia Pollution Prevention Inspections Program: $25,000.

- EPA Pollution Prevention Storm Water Program for Low-Impact Development and Model Ordinance Technical Assistance and Outreach: $33,000.
- EPA Pollution Prevention Storm-water Program Storm Water Management for Construction Impacts Program: $100,000; additional $80,000 pending. Builders Association of the Twin Cities: $75,000 matching grant.
- EPA Pollution Prevention Red River Basin Vegetative Buffer Technical Assistance Program: $35,000.
- EPA Sucker River: $35,000.
- EPA Phosphorous Management: $25,000.

Other Minnesota Pollution Control Agency Pollution Prevention Policy and Regulatory Activities

The 2004 Minnesota Air, Water, and Waste Conference focused on prevention strategies within its program sessions.

The Minnesota Pollution Control Agency (MPCA) sponsored two workshops led by Doug McKenzie-Mohr, author of *Fostering Sustainable Behavior: Community Based Social Marketing*, during the year. His methodology promotes analysis that results in more environmentally protective behavior change through educational and other outreach strategies. It is based on an analysis of the concepts, practices, and measurement protocols associated with behavior change initiatives, in particular, prevention. Participants were MPCA personnel and partners.

In March of 2004, the solid waste utilization rules were finalized. These amendments to Minn. Rules ch. 7035 are designed to help solid waste generators identify alternatives to landfilling. In the first few months of the program, the MPCA issued 12 case specific beneficial use determinations or demonstration research projects that will allow the use of coal ash, wood ash, mixed ash, and municipal solid waste incinerator ash. The rules will help to further the concept of seeing waste as a resource.

In Duluth, all hazardous waste inspections of hospitals include a pollution prevention checklist now. The effort to create this checklist just started this last year. The checklist is being formalized now into a more comprehensive checklist created in conjunction with Catherine Zimmer of MnTAP. Three hospital hazardous waste inspectors (one in Duluth, one in St. Paul, and one in Mankato) use the pollution prevention checklists during regular hazardous waste inspections. They pass completed forms back to Catherine who follows up with hospitals to encourage more pollution prevention results.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Alexandria Technical College employs a continuous improvement process that promotes excellence in environmental management and encourages energy efficiency by using environmentally friendly products and reducing waste, both internally and with our vendor partners. Alexandria Technical College finds audio and video conferencing, online employee education, and electronic transfer of reports and data to be energy- and time-efficient.

Central Lakes College, Brainerd and Staples – Over the last few years, we have encouraged the faculty to use environmentally friendly products and chemicals that would not have to be treated as hazardous waste when disposing of them. We have succeeded in going from a Small Quantity Generator to a Very Small Generator.

Dakota County Technical College (DCTC) – Dakota County Technical College is committed to excellence and leadership in protecting the environment. In keeping with this policy, our objective is to reduce our energy consumption and to promote clean air landscaping. By successfully preventing pollution and conserving energy at its source, we can achieve cost savings, increase operational efficiencies, and improve the environment. Dakota County Technical College's environmental guidelines include the following: Environmental protection is everyone's responsibility. It is valued and displays commitment to DCTC. We will continue to pursue energy conservation and efficiency improvements in our operations, and promote conservation practices and investments in energy-efficient technologies. DCTC will encourage clean air landscaping and strive to reduce the square footage of turf it needs to mow and replace current mowers with the most fuel-efficient mowers available. DCTC seeks to demonstrate its cooperative

citizenship by adhering to environmental regulations. We promote cooperation and coordination among higher education, government, and industry, toward the shared goal of reducing waste at its source and recycling in an environmentally sound manner.

Mesabi Range Community and Technical College – The college is in the process of developing policy and regulatory activities to extend the college's pollution prevention efforts. The college uses electronic communications with clients and uses teleconferencing when appropriate.

Metropolitan State University – Our policy is to operate "green" facilities. This is currently accomplished by using electronic work orders in both facilities and IT departments to reduce paper consumption, installing only energy-efficient equipment that would meet Xcel Energy rebate requirements, complete campus building recommissioning to maximize operating efficiency, monitoring power factor for maximum efficiency, lighting controls in two of four main buildings, energy-efficient lighting, use of environmentally friendly products (low-VOC paint and Citrus degreaser/cleaner), and installation of approximately one acre of "no maintenance" landscaping. Our campus master plan includes more low maintenance landscaping in courtyard area.

Metropolitan State is committed to energy reduction through purchase of high-efficiency equipment, employing energy conserving strategy in state-owned buildings, procurement of products that minimize potential for air pollution, and landscaping that maximizes native plants, minimizes maintenance, and reduces need for gas-powered equipment.

Minneapolis Community and Technical College (MCTC) – In order to regulate pollution prevention, we have updated our Chemical Hygiene plan to control chemical procurement, reduce waste streams, and reduce our hazardous waste generation to a Very Small Quantity Generator. Building and hazardous waste inspections are completed weekly to ensure compliance.

Minnesota State Community and Technical College, Fergus Falls Campus – By culture and practice the college's procurement processes have long considered efficiency and pollution sensitivity. A conscious effort to reduce travel between campuses for meetings began this past year and will continue. Acquisition of poly com technology has provided an alternate meeting venue, and its use is steadily increasing. A fuel vendor in Fergus Falls has, within the past few months, begun to dispense E85 fuel. We have begun a renewed effort to educate employees to refuel with this grade.

Minnesota State Community and Technical College, Wadena Campus – Our student senate and staff have adopted a three-mile stretch of highway along U.S. Hwy 29 between the towns of Deer Creek and Wadena. FY 2005 is our first year of highway adoption, and we will continue cleaning it three times a year. We strive to save trees on a regular basis through the means of e-mail rather than paper documents. Teleconferencing is used on a regular basis rather than traveling back and forth between campuses.

Minnesota State University, Moorhead (MUSM) – Minnesota State University at Moorhead is committed to the preservation, protection, and where possible, the enhancement of our environment in all matters of operation. This includes the obvious goals of meeting or exceeding all applicable local, state, and federal requirements, as well as fostering responsible stewardship by our personnel of all natural resources both in the work place and at home in the community. We promote a proactive policy in environmental matters—one that anticipates and addresses problems before they become a regulatory matter.

MSUM recognizes the strong environmental impact it has and is committed to developing the means to reduce its use of toxic materials, release of pollutants, and generation of hazardous wastes. Maximum results will be achieved through the education of the campus community, and continued investigation and implementation of environmentally friendly products and programs.

MSUM is constantly working toward reducing our environmental impact as a community. Students, faculty, and staff receive education through workshops, newsletters, etc. about environmental policy and awareness to ensure the quality of participation on campus in environmentally healthy practices. Departments are encouraged to purchase recycled goods, reuse materials, and properly dispose of discarded materials. MSUM currently reduces paper volume by using campus e-mail, promoting teleconferencing, providing classroom materials online, and by making registration and other administrative procedures paperless.

A large part of the environmental duties for MSUM is to set an example for the surrounding community, as well as nationwide academic communities. This model is presented each and every day, and continues to grow and develop as environmental policies improve and gain recognition.

Minnesota West Community and Technical College – Minnesota West continues a long tradition of pollution prevention activity. We seek continuously to improve procurement practices and we utilize several forms of electronic communications and video telecommunications.

Northland Community and Technical College (NCTC) – NCTC does not have any formal written policies related to pollution prevention. We practice several methods of prevention. We frequently use various forms of telecommunications, such as teleconferencing, videoconferencing, and ITV with our students and external customers.

Northwest Technical College, Bemidji – Northwest Technical College does not have a written policy or regulations that dictate or keep track of pollution control. Our desire for energy efficiency has a direct impact on pollution reduction. We have an understanding in our Information Technologies (IT) Department that all equipment that is purchased is the most energy efficient available and Energy Star-rated. We encourage the use of electronics for communication in the forms of e-mail, teleconferencing, interactive television, faxing, and hosting meetings on campus to control vehicle usage.

Plant Operations (PO) has an unwritten policy of using only low-VOC water-based paints, floor seals, sealants, and caulks for maintenance and repair. PO also uses only Energy Star-rated replacement motors. PO also makes sure that all renovations and building upgrades, remodels and additions are energy efficient to save operating costs and at the same time reduce our use of energy and its associated pollution generation. The campus recently entered into an energy management and reduction services agreement with Energy Services Group that will guarantee a reduction in our energy consumption and pollution generation. A roofing project that completely replaces the roof with new insulation and a MnSCU standard covering was started this summer. It was initiated with heat loss and infrared scans that showed considerable heat loss. The entire heating system was upgraded this winter with new high-efficiency boilers, and a new digital HVAC temperature control system. An entire building lighting and electrical retrofit was done this past year that includes new energy-efficient main service board, lighting, occupancy controls, and vending machine controls.

Pine Technical College, Pine City – Pine Technical College, as a college, is not a regulatory agency and therefore has no clients that it regulates. It serves students in the East Central Minnesota region. To extend its pollution prevention efforts to those we serve, Pine Technical has adopted electronic communications to replace its traditional student mail system and its internal communications system for faculty and staff.

Ridgewater College – It is general practice at Ridgewater College to encourage the use of electronic instruction techniques such as interactive television and video conferencing for specific classes taught at the same time while reducing the travel of instructors and students between campuses. This practice extends to some college-wide functions. An example is the Master Facility Plan process in which all participating employee groups attend meetings at the campus of their choice and using video conferencing, join the group at the other campus for discussion of facility improvements.

Ridgewater Collage adheres to any and all state of Minnesota initiatives that reduce or eliminate pollution. For example, Ridgewater College uses the state of Minnesota procurement and requisition software that reduces the use of printers and copy machines, reducing paper use and energy consumption.

Riverland Community College, Albert Lea and Austin – Currently Riverland encourages our employees to carpool as an alternative to single-occupancy vehicle commuting. Employees are encouraged to have teleconference meetings between the campuses whenever possible to cut down on travel.

Whenever possible we purchase energy-efficient appliances to reduce state-energy use at our college. Four heavy-duty extra-large clothes washers were bought for two of our departments that have a 1.77 mef. All lighting fixtures have been retrofitted with energy-efficient ballasts and bulbs resulting in a rebate from the Austin Utilities. We have an agreement with our local utilities to curtail our electricity use by 163 kWs per day in Austin whenever we are requested to. In Albert Lea, we have a propane back-up system that we use when asked by the local utilities.

Over the last few years, we have encouraged the faculty to use environmentally friendly products and

chemicals that would not have to be treated as a hazardous waste when disposing of them. We have succeeded in going from a Small Quantity Generator to a Very Small Generator.

St. Cloud State University (SCSU) – Pollution prevention continues to be a factor in purchasing and implementation of new procedures. 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 or post-consumer fiber.

St. Cloud Technical College (SCTC) – We use electronic communications and teleconferencing with our clients whenever possible. We have switched to electronic application procedures when registering for classes. Students are encouraged to use the electronic payment system. High-efficiency office equipment is purchased whenever possible.

Vermilion Community College (VCC) – Over the past two years, VCC has shifted to e-mail as the preferred communication method with both students and staff and faculty. Students are notified at the beginning of each academic year that e-mail will be the primary means of communication from the college. Student mailboxes previously located in the cafeteria were removed last year in favor of electronic communication. VCC also houses three interactive television studios on campus and one at the off-campus Technology Center. These studios are used for delivery of academic courses as well as by the public for teleconferencing. In addition, the Tech Center provides Internet and e-mail access to the general public and those vacationing in the Ely area.

Department of Natural Resources (DNR) – The DNR policy is to purchase products and services that have a reduced impact on the environment, which in return preserves our natural resources for future generations. This is in accordance with Minnesota Executive Order 99-4 and Minnesota Statutes §§ 16B.121 and 16B.122.

We ask the following questions when developing our specifications in purchasing.

- Is it less toxic?
- Is it made from recycled materials?
- Is it reusable or more durable?
- Does it conserve energy or water?
- Can it be recycled? Is it difficult to dispose of?
- Is it made from plant materials?

Product categories that DNR uses and examples of DNR activities include:

- **Energy efficient:** Product uses less energy to accomplish its task, e.g., fluorescent lamps, Energy Star-rated office equipment, fuel-efficient vehicles.
- **Less toxic:** Product contains a smaller amount of toxic substances relative to a comparable product, e.g., solvents, paints, natural-based cleaners.
- **Plant-based:** Product derived from renewable resources, e.g., wood waste, fuels (ethanol and bio-diesel), soy-based inks.
- **Remanufactured:** Products restored to its original condition by extensive rebuilding usually given a better warranty than a new product, e.g., laser toner cartridges, office furniture.
    - Thief River Falls “new” multi-discipline DNR office refurbished and recycled over $15,000 worth of office furniture; building incorporates several sustainable products such as “wheat fiber” cabinetry and “recycled tire” carpets.
    - Warroad Area Forestry Office used $10,000 worth of recycled furniture.
- **Water conserving:** Products that require less water to operate than a comparable product, e.g., plumbing fixtures, reduced volume flush toilets.
- **Rebuilt:** Products refurbished to a level less than remanufactured, e.g., engines, electric motors, and automobile parts.

- **Recycled content (post-consumer):** Products containing materials that have been recovered from the solid waste stream after consumer use, such as paper, paints, trash bags, plastic lumber, carpet, re-refined oil, and rags.
- **Repair:** Products that have a defect corrected and can again serve its original function, e.g., vehicle bodywork, transmissions.
- **Used:** Surplus items no longer needed by one unit but still are still useful and can be used by another unit, e.g., computers, furniture, audiovisual equipment.

Specifications used in determining what products are purchased:

- Using energy-efficient products can save money.
- Improves employee safety.
- Lowers disposal cost.
- Buying less hazardous products can reduce regulatory liability.
- Products that are reusable save energy.
- Buying in bulk creates less waste.
- Buying recycled products keeps our workplace and home recycling programs going.
- Using refillable items is more cost effective than using disposable or single-use items.
- Saves our natural resources.
- Reduces hazardous materials released in the environment.

North Hennepin Community College (NHCC) – NHCC has identified and evaluated the sources of waste generation on campus. Plans have been developed and implemented to separate recyclable or 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.

Department of Revenue (DOR) – The Department of Revenue has actively pursued electronic communications for several years. Tax collections, income, sales, withholding, etc., have been Internet-based for some time now. Each year the percentage of taxpayers using electronic media—and abandoning paper—has increased. New rules require businesses to use electronic technologies to interact, and individual taxpayers are encouraged to use electronic media by the speed of their return. The department is presently reviewing its strategies and mission statements to emphasize these new technologies.

Department of Transportation (Mn/DOT) – The Minnesota Department of Transportation 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 prevent pollution. Mn/DOT's environmental guidelines include:

- lowering expensive disposal costs and liability associated with the use of regulated 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.
- seeking to demonstrate its commitment by adhering to all environmental regulations.
- promoting cooperation and coordination between government and the public toward the shared goal of preventing pollution and conserving our environment.

University of Minnesota

Board of Regents Policy: Sustainability and Energy Efficiency

Adopted: July 9, 2004
Supersedes: Pollution Prevention and Waste Abatement dated June 12, 1992

Section I. Commitment
Sustainability is a continuous effort integrating environmental, social, and economic goals through design, planning, and operational organization to meet current needs without compromising the ability of future generations to meet their own needs. Sustainability requires the collective actions of the University of Minnesota (University) community and shall be guided by the balanced use of all resources, within budgetary constraints. The University is committed to incorporating sustainability into its teaching, research, and outreach and the operations that support them.

Section II. Guiding Principles
Subd. 1. Leadership. Through excellence in environmental education, research, outreach, and stewardship, the University shall strive to be a world leader by promoting and demonstrating sustainability and energy efficiency and by producing leaders and informed citizens.
Subd. 2. Modeling. The University shall strive to be a model in the application of sustainability principles to guide campus operations by:
(a) meeting and aspiring to exceed all applicable regulatory requirements;
(b) preventing pollution at its source;
(c) reducing emissions to the environment; and
(d) encouraging the use of a life-cycle cost framework.
Subd. 3. Operational Improvements. The University shall undertake a continuous improvement process that seeks to meet the operational performance targets, goals, and objectives designed to achieve sustainability.
Subd. 4. Energy Efficiency. The University shall undertake a process to increase energy efficiency, reduce dependence on non-renewable energy, and encourage the development of energy alternatives through research and innovation.
Subd. 5. Research. The University shall (a) promote innovative, high visibility research projects focused on sustainability and energy efficiency to inform campus operations as a whole as well as the broader community; and (b) promote collaborative projects that include faculty research undertaken in partnership with operations staff, students, public entities, community organizations, and industry.
Subd. 6. Education and Outreach. The University shall promote educational and outreach activities that are linked to operational improvements and innovation principles.

Section III. Implementation.
Subd. 1. Administration. The University shall have sustainability goals that inform administrative policies and procedures in the areas of planning, decision-making, execution, assessment, reporting, and alignment. These policies and procedures shall rely on scientific analysis and support the efforts described in subds. 2-4 of this section.
Subd. 2. Operations. Each University campus shall develop specific sustainability objectives and targets in the areas of:
(a) physical planning and development, including buildings and infrastructure;
(b) operations;
(c) transportation;
(d) purchasing; and
(e) waste management and abatement.
Subd. 3. Accountability. The president or delegate shall develop indicators and measures of success in the implementation of the principles outlined in this policy in consultation with appropriate faculty, staff, students, and experts in the broader community.
Subd. 4. Reporting. The president or delegate shall report to the Board annually on progress toward established targets and standards, using this information to identify opportunities for subsequent improvement.

Part 3

Measurements for Activities Satisfying Executive Order 04-08

IPPAT has been designated as the entity to coordinate implementation of the August 2004 executive order on reducing air pollution (Executive Order 04-08: Providing for state departments to take actions to reduce air pollution in daily operations). The actions that state departments are taking are consistent with the recommendations of Clean Air Minnesota (CAM), a voluntary partnership of businesses, government agencies and environmental groups working to keep the air clean. CAM promotes voluntary actions to reduce air pollution in the Twin Cities and throughout the state.

State departments, as well as other agencies with membership in IPPAT, have responded to the Governor's executive order by committing to at least two of the activities listed below and have made attempts to quantify their reductions, recognizing that better data will be available as our reporting practices improve. Each department needed to pick at least two actions from the following list of eight activities to reduce air pollution.

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department. Fourteen agencies committed to this activity

b. Refuel state-operated vehicles with the cleanest fuel available. Sixteen agencies committed to this.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting. Sixteen agencies committed to this activity.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances. Eleven agencies committed to this activity.

e. Employ energy-conserving strategies in state-owned or leased buildings. Eleven agencies committed to this activity.

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds. Six agencies committed to this.

g. Employ landscaping that reduces the need for gasoline-powered maintenance equipment. One agency – the Department of Natural Resources – committed to this activity.

h. Purchase electricity generated from renewable sources. No agencies committed to this activity; however, several agencies have reported quantifiable savings due to the agencies' purchase of renewable electricity.

The total quantities of reductions in all the agencies that reported were calculated using spreadsheets developed for the IPPAT by air quality staff at the Pollution Control Agency. Results are summarized in the following table, showing reductions in carbon monoxide, carbon dioxide, mercury, oxides of nitrogen, particulate matter of 10 micrometers in diameter, particulate matter of 2.5 micrometers in diameter, sulfur dioxide, and volatile organic compounds (VOCs). The reductions were achieved from activities listed in the first column of the table.

STATE AGENCIES REDUCTION TOTAL

	Total Emissions Reduction (in pounds)							
Action	**CO**	**CO_2**	**Hg**	**NOX**	**PM10**	**PM2.5**	**SO2**	**VOC**
Diesel vehicles	17.3	1,135.5	0	79.7	10.4	9.6	0.0	11.6
Gasoline vehicles	23,651.2	194,775.9	0.0003	1,903.3	11.8	5.8	15.4	1,900.6
Commuter	0	0	0	0	0	0	0	0
EE office equipment	31.7	198,669.0	0.0047	441.7	40.1	30.8	797.7	4.1
Energy conservation	4,378.7	8,175,797.0	0.0707	10,269.0	862.0	745.7	10,012.0	312.1
Low VOC products	0	0	0	0	0	0	0	0
Landscaping	743.9	1,363.1	0	4.1	2.3	2.1	0.3	29.9
Renewable electricity	116.6	728,262.2	0	1,617.7	146.8	112.8	2,920.1	15.1
Total*	28,939.39	9,300,002.69	0.0928	14,315.47	1,073.37	906.84	13,745.43	2,273.43

*Some agencies reported only totals, without breaking results from individual activities.

As shown in the table, agencies achieved the greatest total reductions by changes in gasoline vehicle fleets, followed by energy conservation measures employed in state agency buildings. Although 16 agencies committed to encouraging employees to choose alternatives to single-occupancy vehicle commuting, none of them were able to quantify reductions as a result this year. We expect to be able to improve reporting of these results in future years. The same is true for the commitment to use products with lower concentrations of VOCs. Determining reductions in VOC content requires knowledge of the products that most agencies lack at this time.

Agencies reported documented purchases of 44,600 gallons of E85 fuel, with many agencies unable to determine the precise number.

Department of Agriculture

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

The Minnesota Department of Agriculture is in the process of surplusing and consolidating all office equipment (copiers, printers, fax machines, etc.) in preparation for the move into our new building. The new facility will employ an open office, "neighborhood center," concept of office equipment usage. Instead of having office equipment stationed at multiple locations (private offices) throughout the building, all office equipment will be centrally located in the neighborhood centers. There will be a neighborhood center in each main work area of the building (12 total). The neighborhood-center design concept has been proven effective in multiple corporate settings when it comes to reducing costs and energy consumption. Because of this transition, no new office equipment has been purchased during fiscal year 2005. A calculation of energy savings should be available at the end of fiscal year 2006 once all existing office equipment in our building has been surplused, with the remaining units consolidated into the neighborhood centers of the new building.

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds.

The department has not purchased any products (paints, solvents, cleaners, etc.) containing volatile organic compounds (VOCs) since the inception of the Clean Air Executive Order due to the fact that all cleaning, maintenance, and janitorial services are provided by our current landlord. However, the Minnesota Department of Agriculture is in the process of finalizing a contract with an outside vendor (Admin's Plant Management Division) to provide cleaning and janitorial services for our agency in the new facility. The terms of the contract are as follows:

> "The Contract Vendor shall use environmentally safe products as defined by the State. A list of current items that the State has determined to be environmentally safe based on extensive evaluation and review has been compiled by the Department of Administration and included in the RFP.

The Contract Vendor must ensure that all chemicals and instructions for use of cleaning equipment and chemicals be in English and all other languages of persons using the product.

The Contract Vendor must have Material Safety Data Sheets (MSDS) on all cleaning products available at the work location to meet all Right-to-Know requirements. The MSDS must be in English and in the language of the person using the product.

Only janitorial equipment specified for high-quality indoor air environment is used in the buildings. This includes only vacuums equipped with two-stage HEPA filter system, to ensure indoor air quality (IAQ) standards are met.

We believe that the above contract language (specifying the type of products/cleaning supplies/equipment to be used) will significantly reduce the total VOC content in products used within the new facility. Quantifiable data (amounts used and VOC content) of the new products should be available at the end of FY 2006.

Bemidji State University (BSU) – Bemidji State University currently employs energy-conserving strategies in state-owned or leased buildings. The university plans to purchase electricity generated from renewable sources.

Department of Commerce – The department has the following committed actions:

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

b. Refuel state-operated vehicles with the cleanest fuel available.

Vehicle procurement is currently and will continue to be made at the division level. In FY 2006, the department will organize a centralized vehicle tracking database and educate division staff about alternative vehicle and fueling options in accordance with Executive Order 04-08. Statistics on vehicle replacement and fuel use emissions reductions but should be available in FY 2006.

Uncommitted actions:

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

The department provides a comparable incentive for single-occupancy, Metropass, and carpool employees. Vanpool incentives will likely be implemented in FY 2006. Bike racks are available on all four sides of the building (within 50 feet). Statistics from FY 2004 were unavailable to quantify any decrease in emissions in FY 2005.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

The department installed 233 LCD flat-screen computer monitors (no-lead, low-energy) in FY 2005. The change will save approximately 41,241 kWh per year (233 monitors at 177 kWh/year/monitor).

TOTAL EMISSIONS REDUCTION (IN POUNDS)

	CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
EE office equipment	12.1	75,835	0.002	168.6	15.4	11.8	304.5	1.6

Department of Corrections (DOC) – The Department of Corrections selected item a. and item f. from the list contained in Executive Order 04-08.

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

The activities for improvement for this item appear in Part 4, section 7, *Automotive Maintenance.*

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds.

The activities for this item appear in Part 4, section 9, *Cleaning Supplies*. The department's paper consumption summary appears in Part 4, section 22, *Office Supplies.*

Department of Employee Relations (DOER) – DOER's commitment to Executive Order 04-08 includes:

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

g. Employ energy-conserving strategies in state-owned or leased buildings by implementing a computer monitor power management policy.

In FY 2005, DOER began implementation of our computer monitor power management policy. By the end of FY 2005, 25 percent of the computer monitors within the department have been configured to turn off the monitor after 20 minutes of inactivity. Energy Star reports that computer monitors set to sleep mode after 20 minutes experience an annual estimated savings of 200 kWh per monitor (www.energystar.gov/index.cfm?c=power_mgt.pr_power_manage_reps). All office equipment purchased/leased during FY 2005 was Energy Star compliant. DOER acquired 50 new computers and 12 new monitors.

Department of Employment and Economic Development (DEED) – The following lists the commitments that were made by our agency to satisfy Executive Order 04-08:

b. Refuel state-operated vehicles with the cleanest fuel available.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

e. Employ energy-conserving strategies in state-owned and leased buildings.

Iron Range Resources and Rehabilitation Agency (IRRR) – Agency-wide energy-conserving practices at our facilities include but are not limited to:

- Replace light bulbs with energy-efficient lamps.
- Our agency leases Toshiba e-studio copying machines, and all copiers have the Energy Star label on them.
- Landscaping projects put some of the land back into its natural condition, reducing the need for gasoline-powered maintenance equipment.
- Encouraging electronic communication among staff to help reduce paper usage and travel between our three facilities.
- Iron Range Resources employees have formed carpools as an alternative to single-occupancy vehicle commuting.
- Employees at Eveleth have formed a carpool commuting daily from Duluth to Eveleth, saving 10 round trips per week.
- Employees at Eveleth have formed a carpool from Aurora/Hoyt Lakes to Eveleth, saving 10 round trips per week.
- Employees at Chisholm have formed a carpool commuting daily from Aurora to Chisholm, saving five round trips per week.
- Commuter miles saved totals 63,000 annually.

Metropolitan Airports Commission (MAC) – MAC's commitment to satisfying the requirements of Executive Order 04-08 is as follows:

a. Purchase or lease the most fuel-efficient and least polluting vehicles.

To meet this requirement, staff has identified new vehicle purchases that are capable of being alternative fuel compatible. This will allow MAC to use E85 or other clean fuel options or technologies that are available.

b. Refuel vehicles with the cleanest fuel available.

To meet this requirement, MAC staff will transition to bio-diesel in the existing diesel-powered equipment, which does not require any modifications to the equipment or to fueling tanks. For MAC's gasoline-powered vehicles, E85 will be used in compatible vehicles, as they become operational. Funding has been approved to make modifications to pumps, meters, and a fuel storage tank.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

MAC specifies the purchase of computer equipment to be Energy Star-compliant where applicable or have energy-saving "sleep modes" when not in use. Although MAC has very few other appliances, new purchases are specified to have high-efficiency ratings.

e. Employ energy-conserving strategies in state-owned or leased buildings.

MAC has consistently developed and remodeled facilities using energy-saving strategies. Recent boiler upgrades have resulted in efficiency increases of 20 percent. New chillers consume 33 percent less energy. Other energy-saving activities include strategic seasonal temperature adjustments and reuse of steam for preheating boilers and powering water pumps. Additionally, MAC participates in a gas curtailment program that reduces consumption of natural gas during periods of peak demand by using jet fuel to power boilers.

Metropolitan Council Environmental Services (MCES) – MCES has seven dual fuel vehicles, but only one is fueled with E85 on a regular basis. See Part 4, section 10, *Commuting, Transportation*. The use of recycled content office paper is presented in Part 4, section 22, *Office Supplies*.

Metropolitan Council Metro Transit – Metro Transit currently has both hybrid buses and cars using the engine/electric system. Metro Transit recycles the waste paper for its office building and continues to purchase recycled content paper for all printing.

Department of Military Affairs (DMA) – The DMA has selected to implement two air quality pollution prevention actions.

b. Refuel DMA equipment with the cleanest fuel available

The DMA has several fleets of vehicles available for use by state and federal personnel. Fuel usage data was collected from the following four sources: the GSA fleet assigned to the Directorate of Logistics (DOL) at Camp Ripley, state vehicles leased from the Department of Administration, and tactical vehicles located across the state. Below is the data collected from each of the four sites:

- The Recruiting Retention Command (RRC) located at Roseville has 108 vehicles in its fleet, of which 100 are alternate fuel vehicles (AFV). During FY 2005, the RRC purchased 108,600 gallons of fuel, of which 1,080 gallons was E85.
- Only the fuel usage numbers were available for the DOL GSA fleet. There was 43,000 gallons of fuel purchased for AFVs during FY 2005, of which 3,900 gallons was E85 fuel.
- The DMA leases 13 AFVs from Admin. There was 6,704 gallons of fuel purchased for these vehicles. No E85 data was available.
- The only numbers we have for tactical vehicles are for fuel usage. Tactical vehicles are located across the state. In FY 2005, the DMA purchased 512,973 gallons of diesel fuel, 22,000 gallons of unleaded fuel, 900 gallons of gasohol, and 600 gallons of 10 percent unleaded fuel for the DMA tactical vehicle fleet.

e. Employ energy conserving strategies in buildings

- Many projects undertaken by the MNARNG contributed to increased energy efficiency at our facilities. Where roof membranes were replaced, the underlying insulation was also replaced. New membrane installations typically include greater levels of insulation than what was removed. Where this work has been undertaken in previous years, it has resulted in energy savings of 10 to 20 percent.

- Most of the major projects described below include installation of building automation equipment enabling the Facility Management's Department of Public Works to remotely monitor the performance of the installed HVAC equipment from its central location at Camp Ripley. This equipment also provides the ability to schedule operation of the HVAC equipment resulting in the ventilation equipment only operating when it is needed and thus expending energy to temper ventilation air only when the facilities are occupied. The following lists the DMA sites where energy-efficiency projects were undertaken:

Cloquet Armory: The following project that was reported as being underway last year was completed during FY 2005. A steam boiler was replaced by two hot water boilers of higher efficiency and lower total gas consumption. System is online. Water heaters were replaced with higher efficiency units. Project included replacement of an inactive backup fuel oil supply system with a propane backup system. Lighting fixtures throughout the building were replaced with higher efficiency units; this included replacement of the incandescent fixtures in the drill hall with fluorescent fixtures using about 80 percent less energy. Concurrent with the heating system work, a separate rehabilitation project has replaced the roof membrane.

Grand Rapids Armory: The following project that was reported as being underway last year was completed during FY 2005. A steam boiler was replaced by two hot water boilers of higher efficiency and lower total gas consumption. System is online. Water heaters were also replaced with higher efficiency units. Project included replacement of a backup fuel oil supply system with a propane backup system. Lighting fixtures throughout the building were replaced with higher efficiency units; this included replacement of the incandescent fixtures in the drill hall with fluorescent fixtures using about 80 percent less energy. Concurrent with the heating system work, a separate rehabilitation project replaced the roof membrane.

St Paul Cedar Street Armory: Project underway now will replace remaining light fixtures throughout the building with new high-efficiency fluorescent fixtures, which use approximately 25 percent less energy. Approximately 40 incandescent and mercury vapor fixtures in the drill hall were replaced two years ago with a smaller number of higher efficiency metal halide fixtures. Total demand reduction from this work was 20 kW.

Minnesota Pollution Control Agency (MPCA) – The Pollution Control Agency selected items a. through f. from the list contained in Executive Order 04-08.

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

During the past year, the agency has taken steps to reduce emissions and improve the environmental performance of its fleet of 128 vehicles. Currently, the MPCA has 64 flex fuel vehicles and three hybrid vehicles. The MPCA has established 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.

b. Refuel state-operated vehicles with the cleanest fuel available.

The MPCA has 64 flex-fuel vehicles and three alternative vehicles. Currently, the MPCA is averaging about 30 to 40 percent each month in 2005, compared to 24 percent in 2004, 17 percent in 2003, and 12 percent in 2002. For more details, see *Part 4, Section 6 Automotive Fuels*.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

The Minnesota Pollution Control Agency has a continuing pollution prevention program of promoting alternative transportation that includes an annual B-BOP Day promotion; Bikeways and Bus Fare E-newsletters; participation in the Guaranteed Ride Home Program; telecommuting; special off-day parking; reserved carpool/vanpool parking; discounted bike lockers; showers; and conducting surveys and planning programs. In the January 1998survey summary, the MPCA found that six percent of its employees biked to work in the summer and 25 percent carpooled on three or more days per week.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

e. Employ energy-conserving strategies in state-owned or leased buildings.

The Minnesota Pollution Control Agency's 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. In 2004, all closed

offices, restrooms, and conference rooms in the St. Paul building were equipped with motion-detecting light switches.

The MPCA 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 day lighting. The floor plan is specifically designed to allow the maximum amount of light to enter the workspaces. The MPCA installed a revolutionary new day lighting feature, tubular skylights in the Brainerd Office administrative area, to test and measure performance and energy savings. The Brainerd Office also installed motion-detecting light switches in many office areas to help reduce the amount of electricity used.

The Duluth Office also installed full spectrum fluorescent bulbs. All the above technologies help minimize the need for additional lighting and its concomitant energy use and air pollution.

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds. Six agencies committed to this.

The Minnesota Pollution Control Agency's Brainerd Office features low-VOC paint and finishes, high recycled-content resilient carpeting and flooring, and recycled-content or recycled Styrofoam ceiling tiles. Maintenance staff at the St. Paul office uses only low-VOC paints for internal and external painting projects. In FY 2003, the MPCA remodeled one floor and only low-VOC paints were used.

Other activities: See Parts 4 and 5 for what quantitative commitments exist, particularly with respect to transportation issues.

EMISSION REDUCTIONS (IN POUNDS)

	CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
Total	0.859	2,053.056	0	3.198	0.278	0.228	4.302	0.067

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Alexandria Technical College currently participates in the State vehicle lease program. Our current fleet of leased vehicles is being upgraded to include more fuel-efficient models of vehicles. As office equipment is replaced, we strive to find more efficient equipment. More efficient flat screen computer monitors have replaced most of the CRTs at our facilities to reduce energy consumption. Two 100-gallon water heaters on the main campus have been replaced with high-efficiency condensate models with a 98 percent Energy Star rating.

Energy conservation strategies have been a major focus for ATC's Facilities and Maintenance Department. Our continuous energy conservation program includes winterizing all overhead doors each fall and replacing T-12 fluorescent lighting with T-8 fixtures. The T-8 fixture is 30 percent more energy efficient than the T-12 model. Our team has replaced one-eighth of the exterior windows in our main facility with more energy-efficient models. This is part of a phased plan that will continue until all of the exterior windows have been replaced. More energy-efficient burner units are purchased to replace nonfunctional units on our heating system.

Our Facilities Maintenance Department has converted most of their cleaning products from aerosol sprays to either pump sprays or squirt bottles to reduce our generation of and exposure to VOCs. This has been communicated to our staff so that they may make informed decisions when purchasing these products. One program within our campus has converted from a petroleum-based parts cleaner to an environmentally friendly orange-based cleaner in their parts washers. Landscaping of newly developed areas employ xeriscaping designs to reduce the use of gasoline-powered maintenance equipment, fertilizers, and also to reduce fire hazards.

Central Lakes College, Brainerd and Staples – Central Lakes College's first commitment to Executive Order 04-08 was to purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department. In June, we purchased three vehicles that have capabilities to

burn E85 fuel.

The second commitment was to employ landscaping that reduces the need for gasoline-powered maintenance equipment. We have reduced our maintained grounds by 4.5 acres by planting prairie grass and building ponds and gardens. We have an ongoing commitment to use prairie restoration plots and gardens college-wide.

Inver Hills Community College (IHCC) – Inver Hills uses electronic means of communications when ever possible, as well as teleconferencing. Steps have been taken to purchase and continue to use vehicles that are most efficient and have a high miles-per-gallon ratio. Inver Hills vehicle is fueled using clean E85 fuel. We have created an intranet area where employees are encouraged to communicate about setting up rideshare and using it. IHCC also is on a curtailment plan with Xcel, reducing our power consumption rate. Our maintenance staff has started using "green" cleaning chemicals to reduce air pollution. The grounds staff has installed more bedding plants and has landscaped to reduce the amount of grass to water and cut, allowing us to reduce the number of hours we need to use gasoline-powered equipment.

Mesabi Range Community and Technical College

a. The college leases two mini vans that use E85 fuel, and employees are encouraged to purchase this fuel when available.
b. If available, the college uses E85 fuel.
c. Athletic teams, recruiters, and staff are encouraged to travel to meetings, events, etc. together whenever possible, i.e. men's and women's athletic teams travel to athletic events together.
d. All new equipment purchased is up to date and is the most energy efficient possible.
e. Air handling units are shut off in the evening during heating season. Radiant heat only is used for heating the building during this time. A new HVAC system was installed in the 2004 remodeling project on the Virginia Campus. The HEPRA request for the Eveleth Campus, if funded, would upgrade the HVAC system and help with energy conservation.
f. The college uses water-based (not oil-based) cleaning compounds whenever available.
g. Some re-landscaping is being done, and more is being considered in the future to reduce the need for gasoline-powered maintenance equipment.
h. The college does not have a source for electricity generated from renewable sources at this time.

The college did not have the information necessary to use the Emissions Reduction Calculator for this year. This will be a part of our report submission in future years.

Metropolitan State University – Paper consumption for FY 2005 totaled 16,190 reams. All paper purchased was 10 percent post-consumer. We do not have FY 2004 for a comparison. Total automotive fuel purchased was not available at the time this report was completed.

Minneapolis Community and Technical College (MCTC) – The two activities MCTC committed to last year are the following:

c. MCTC is in the process of encouraging employees to consider alternatives to single-occupancy vehicle commuting. We offer discounted bus passes, free motorized vehicle parking and bike racks.

f. MCTC is also in the process of procuring and using products with the lowest potential to contribute to air pollution. Our products are low in volatile organic compounds (VOCs). Examples include: Stride Citrus HC which is GS-37 certified and has 0g/L VOC, Glance NA is GS-37 certified and has 0.1 g/L VOC, and Freedom Stripper has 100.7 g/L VOC (this was a reduction from the Envirosolution Stripper).

Minnesota State Community and Technical College, Wadena Campus – We have undergone a complete lighting retrofit on the Wadena Campus. We updated our lighting with energy-efficient ballasts and light bulbs, and have installed motion-sensitive light switches in some classrooms. Along with this project, we have also updated our pneumatic control system and computerized our air-handling units. Our plans are to turn approximately two acres of grass into parking lot.

Minnesota State University, Moorhead (MSUM) – MSUM is actively participating in all eight areas of Executive Order 04-08; reporting of quantifiable measurements is provided for only two specific areas: landscaping and renewable energy. The remaining six activities for Executive Order 04-08 are discussed in *Part 4: Pollution Prevention Activities during the Fiscal Year 2005*.

Northland Community and Technical College – We do not have quantifiable data to enter into the calculator.

a. We have purchased E85 fueled vehicles as we replaced older models or added to the college fleet. In our present fleet of 43, approximately 12 vehicles are E85 fueled.
b. We encourage employees to refuel vehicles with the cleanest fuel available.
c. We encourage employees to carpool with other employees when traveling to meetings, campuses, etc.
d. We purchase energy-efficient computers, copiers, and other equipment.
e. We utilize energy-efficient lighting systems.
f. We purchase recycled office paper, and recycle office paper, toner cartridges, compact discs, plastic bottles, cardboard, newspaper, magazines, and aluminum cans.
g. We do not employ landscaping that reduces the need for gas-powered equipment.
h. We do not purchase electricity generated from renewable sources.

Pine Technical College, Pine City – As the pollution prevention efforts either were not possible or do not fit the parameters of emissions reductions worksheet, that submittal is not included in this report.

Ridgewater College – The activities listed in the executive order are:

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

Ridgewater College currently leases fleet vehicles. No new leases have been necessary in the last 12 months. However, as additional or replacement vehicles are needed, Ridgewater will request models that are fuel efficient, and/or burn E85 alternatives.

b. Refuel state-operated vehicles with the cleanest fuel available.

As vehicles are leased with clean fuel recommendations, all college employees will be required to refuel with clean options as needed or recommended for the vehicle.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

Ridgewater College does discourage single-occupancy commuting whenever possible.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

Ridgewater College will continue to review energy-efficient options in all purchasing decisions. While we purchase very little residential equipment, we give all attention to locating and researching Energy Star options as they apply to our needs.

Ridgewater College is undergoing balancing activities on the Willmar campus mechanical systems to reduce energy use by efficient mechanical operations. Results will not be available for quantification until end of FY 2006.

e. Employ energy-conserving strategies in state-owned or leased buildings.

Ridgewater College employees have been instructed to turn lights off as they leave a room. Further, the employees are encouraged and reminded to conserve energy in such activities as turning off computers and office equipment after completed shifts, discouraging the use of electronic equipment brought in from home such as office refrigerators, coffee makers, and heat/cool devices.

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds.

Ridgewater College recently had the opportunity to purchase a distillation unit for use in an automotive body lab. The distillation unit will decrease or almost eliminate VOCs for F-listed wastes.

g. Employ landscaping that reduces the need for gasoline-powered maintenance equipment.

Ridgewater College is pursuing landscaping plans as part of its master facility planning efforts. It has been requested that all future landscape plans use low-maintenance plantings and techniques.

h. Purchase electricity generated from renewable sources.

Ridgewater College will continue ongoing efforts to work with the city of Willmar on the use of wind energy. Past efforts have not been fruitful but continued communications look more promising in the future.

Riverland Community College, Albert Lea and Austin – Riverland's first commitment to Executive Order 04-08 was to encourage employees to refuel state-operated vehicles with the cleanest fuel available. In May, our Truck Driving program began using bio-diesel fuel (less than 500 parts of sulfur per million) in 45 percent of its trucks, compared to using regular diesel fuel that is 1,300 parts of sulfur per million.

Our supplier will start selling ULSD (under 15 parts of sulfur per million) next spring, at which time we will switch to that. These fuels do not work well in real cold weather, so when weather permits, we will use the cleaner fuel.

The second commitment was to mow some areas of our campus less than usual. Approximately 8 acres in Austin are being mowed less (estimating three hours of tractor use and five gallons of fuel). In Albert Lea, we lease 25 acres to an area farmer for crops. In Owatonna, four acres are planted in prairie grasses that require very little mowing or care.

St. Cloud State University (SCSU) – SCSU is moving toward commitment to the full range of Executive Order 04-08 activities. Note, much of our progress is general only, (currently very expensive to quantify with hard specifics). As we study and promote system changes to efficiently capture this type of information, we will move toward reliable benchmarking and control within the academic freedom parameters of our university environment.

Virgin paper use of about 850 reams (4,250 pounds) of colored paper used in our student union copy shop was close to the 838 reams used last year. (Where feasible, recycled color paper was used.) All of the white paper used in that copy shop was standard campus recycled paper of minimum 30 percent recycled content and 30 percent post-consumer fiber content. Campus consumption of this standard recycled paper declined by 5 percent from 49,900 reams (249,400 pounds) to about 47,400 reams (237,000 pounds). More data will be sought on 100 percent post-consumer fiber content paper usage possibilities.

a. SCSU is focused on purchasing/leasing the most fuel-efficient and least polluting vehicles that meet our operational needs. We've gone from 16 E85 capable motor pool vehicles to 18 of them, replacing our two highest mileage and dedicated Public Safety vehicles. (We have 25 total motor pool vehicles including our two new E85 Ford Taurus 2005 purchases.) Meanwhile, E85 fuel usage for this fiscal year has remained within 50 gallons of last fiscal year's total of 13,500 gallons. One 15-passenger van was replaced with a 12-passenger unit. Grounds Maintenance and Athletic Departments are experimenting with golf cart sized/type vehicles also. Everything is being done within the limitations of overall total cost control and remaining economic life. (This presently limits hybrid considerations, but we are making the effort). Air emission reduction calculations are not shown, because they are pretty much a wash with virtually the same E85 fuel usage, in spite of an increase of E85 vehicles.

b. SCSU is also promoting E85 usage by making campus refueling with it more convenient. This is in addition to two more E85 vehicles as described in item a above

c. SCSU encourages employees and students to consider alternatives to single-occupancy commuting by co-sponsoring free bus rides with St. Cloud Metropolitan Transit Commission. Ride shares and carpools are also encouraged and promoted.

d. SCSU purchase of Energy Star appliances and office equipment is encouraged to reduce state energy use. Our IT and Computer Store technicians and managers are a vital part of SCSU controls and Energy Star sleep mode encouragement to promote reduced state energy use compliance. There is also strict review of leased or purchased copiers and other office machines. Future SCSU rental unit appliance replacement purchase planning is being challenged to incorporate energy considerations.

e. SCSU employs energy-conserving strategies in our buildings. For instance, Centennial Hall Renovation is being planned with special design/engineering contracts and Xcel Energy Utility specialist involvement to ensure life-cycle energy savings. This joint planning has also earned us project rebates of up to $14,000. Memos encouraging heating energy conservation and retrofit projects such as new more energy-efficient dorm window replacement are also underway while we become

more focused on better building design.

f. SCSU actively procures cleaning and painting products based on potential air pollution. Liquids and surface spraying is promoted over aerosols. VOCs are discouraged with a special review committee and O/EHS participation to ensure substitution/replacement. Latex paint is promoted; use of oil-based paint is very limited.

g. SCSU is experimenting with landscaping and prairie growth, which reduces gasoline use. We are planning how to curtail such use during air quality alert days.

h. This April, SCSU has committed to experiment with wind-generated electricity provided through Xcel Energy. Investment is minimal to promote learning opportunities which will help balance higher cost.

St. Cloud Technical College (SCTC)

a. We lease our vehicles from Travel Management Division, what they purchase is what we use.

b. We refuel our leased vehicles with the fuel recommended by Travel Management Division for the vehicles we lease.

c. While staff is on college business, carpooling is encouraged and practiced.

d. A consulting firm accomplished an environmental/energy audit at SCTC and the conclusion was the college is very efficient when dealing with pollution prevention and using high-efficiency equipment.

e. We have switched to a 4-day, 10-hour-a-day workweek to save energy during the summer hours. We have shortened the custodial staff work shifts so the building can be shutdown earlier. We use an energy management system that helps improve the efficiency of the HVAC system and improve indoor air quality. We are in the process of replacing the ballasts in the lights with electronic ballasts. The campus lights are on motion detector sensors so the lights turn off when they are not needed, this saves electricity.

f. We continually review our products and use the most environmentally friendly products available in our labs, classrooms, and maintenance area.

g. Planting of trees and building expansion have reduced the need for use of gasoline-powered equipment for mowing.

Vermilion Community College (VCC) – The activities chosen by Vermilion to satisfy Executive Order 04-08 included employing energy-conserving strategies in state-owned or leased buildings and employing landscaping that reduces the need for gasoline-powered maintenance equipment. The quantifiable reductions of these activities are included below.

A reduction in fuel oil consumption of approximately 7,000 gallons was the result of shutting down the central boiler for the summer months. In the past, the boiler was used only to heat domestic hot water in the Residence Hall and athletic locker rooms during the warm weather months. This is now achieved through the addition of an electric hot water heater in the Residence Hall and the repair of electric hot water elements in the locker rooms. This change not only allowed for significant energy and cost savings, but also contributes to the longevity of the central boilers. In addition, we ceased mowing ½ acre of land where a weather station used to stand. The weather station was removed and the land left to revert back to its natural state.

TOTAL EMISSIONS REDUCTION (IN POUNDS)

	CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
Energy conservation	35.000	156,100.000	0.003	168.000	16.660	14.910	596.400	2.380
Landscaping	250.144	461.588	0.000	1.446	0.799	0.735	0.095	13.089
Total	285.144	156,561.588	0.003	169.446	17.459	15.645	596.495	15.469

Department of Natural Resources (DNR) – The DNR is implementing the following air quality pollution prevention actions:

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

- DNR continues to explore additional avenues to conserve fuel, reduce pollution, and to preserve the natural resources. During FY 2005, DNR promoted the purchase of video conferencing equipment to reduce the need for vehicle travel.
- The DNR-wide fleet policy states:
  - Employees are to carpool to meetings.
  - Use most fuel-efficient vehicle when going to meetings.
  - Promotes the purchasing of the most fuel-efficient equipment.
  - Standardized equipment purchases and promotes the reduction of unnecessary options.
  - Conducted defensive driving courses that promote proper speeds and safe vehicles through proper maintenance.
- Purchases alternative fuel vehicles: As of July 15, 2005, our history of fuel-efficient cars is listed below.
  - 1 full electric
  - 8 gas/electric (hybrid)
  - 186 E85 fuel capable:

1996	1	
1997	1	
1998	3	
1999	23	
2000	11	
2001	16	
2002	22	
2003	3	
2004	36	
	70	(34% of total purposes)

b. Refuel state operated vehicles with the cleanest fuel available.

DNR is currently working with Mn/DOT, Admin, and the Minnesota Lung Association to increase use and distribution of E85 and bio-diesel fuels. The website for E85 fuel sites is distributed to all employees. Where clean fuel is not available, we have developed a plan to increase or modify on-site storage at about 40 remote sites across the state.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

The Minnesota DNR has a policy in place to encourage the efficient and wise use of state transportation. This policy is given to each new employee and distributed to all employees on our intranet website.

We have purchased and set up teleconferencing equipment. We have had 12 meetings with participation of from 14 to 25 regional staff at each meeting. This has reduced travel by over 15,000 miles and saved an estimated 800 gallons of fuel.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

Purchase for replacement items are on a scheduled basis. Efficiency is a heavily weighted criterion for selection to purchase.

e. Employ energy conserving strategies in state-owned or leased buildings

- Paper products: Copy paper, file folders, envelopes, “Post it” notes, and cardboard storage boxes are all made with post-consumer recycled content.
- Printing: Use post-consumer or chlorine-free paper, vegetable based inks.
- Office machines: Copiers are purchased that have duplexing capabilities, which can reduce paper use by up to 40 percent, incorporates energy conservation, is digital (direct link form computer), and can use up to 100 percent post-consumer paper.
- Computers and monitors use energy conservation mode.

- Laser printers have duplexing capabilities, energy conservation mode, and can use post-consumer paper. Cartridges can be recycled and recharged.
- Vehicle maintenance: We use refined oil and recycle antifreeze, parts solvent, tires and batteries.
- Signs: We purchase plastic signs that are made out of post-consumer plastic which can be recycled.
- Janitorial supplies: Our warehouse offers a full line of environmentally friendly cleaners.
- Trash bags are made with post-consumer recycled material and are biodegradable.
- Lights: Purchase energy-efficient fluorescent lights and occupancy sensors.
- Carpet: Purchase carpet that is manufactured with recycled plastic and rubber.
- Paint: Use recycled latex paint in remodeling and new construction.
- Plastic lumber: Park benches, picnic tables, parking curbs, retaining wall timbers, and decking.

f. Procure and use products with the lowest potential to contribute to air pollution such as cleaning products with low amounts of volatile organic compounds.

North Hennepin Community College (NHCC) – With the departure of our Safety and Security Director, data needed to complete this section of this report is not available. One area that we have made some strides in is the reduction of lawn area that requires mowing. Approximately five acres have been removed from lawn care and put into nature preserve condition.

Department of Revenue (DOR) – The DOR has always had a commitment to reducing waste and pollution. Over the years, we have encouraged our employees to use recycled paper, toner products, mass transit, van pools, etc., some successfully, some not so successfully.

- Our vehicle fleet, though small, is made up of vehicles designed for E85t.
- We have worked with the Department of Administration to first pilot and then institute a lighting program at our largest facility at 600 North Robert in St Paul. We reviewed the way we work: Over the past few years, we have become more computer oriented and less dependent on manual activities requiring higher lighting levels. We analyzed the building's lighting as it was designed and found that for the changing work environment we were providing more light than needed, also producing more glare and related lighting issues. After a couple of pilot projects, we proposed to the Department of Administration that we remove one of the three fluorescent tubes in each of some 3,000 light fixtures throughout the building. To date only a few have been returned to the full set of three as requested by employees. (3,000 lights reduced by one 32-watt tube per fixture equates to 240,000 kW per year).
- Revenue has restricted the use of coffee makers and eliminated the use of coffee warmers and auxiliary heaters. This not only reduces fire hazards, but it also avoids problems with dozens of electrical appliances operating, many non-productively, throughout the day.
- Our older CRT computer monitors are being replaced with Energy Star LCD displays, which consume half the energy and provide less glare. Our new LCD monitors draw 38 watts versus 85 watts for the older ones that are being phased out. (700 monitors operating 8 hours per day, 250 days per year equals 65,800 kW per annum). Also, fewer watts used produces less heat, which lowers the demand for cooling.
- Lighting in the building was designed with occupancy monitoring. When an office has been vacated for several minutes, the lights go off.

Department of Transportation (Mn/DOT) – Mn/DOT has committed to:

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department. See below in Part 4, section 6, *Automotive – Fuels.*

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting. See Part 4. section 10, *Commuting, Transportation.*

e. Employ energy-conserving strategies in state-owned buildings or leased buildings. See Part 4, section 13, *Energy – Lighting*, section 14, *Energy Production*, and section 17, *Heating, Ventilation, Air Conditioning (HVAC), Indoor Air Quality.*

University of Minnesota – The university has documented the following pollution prevention activities:

AUTOMOTIVE FUEL: E85 PURCHASE

	FY 2003	FY 2004	FY 2005
Total vehicles	795	830	835
E85 vehicles	42	38	71
E85 percent of fleet	5.28	4.58	11.8
Hybrid vehicles	3	4	14
Gallons of E85 purchased	19,867	18,636	16,997

OFFICE PAPER USAGE WWW.OFEE.GOV/RECYCLED/CALCULAT.HTM

Office paper purchased by UStores	**2002**	**2003**	**2004**
Traditional paper (reams)	150,000	143,000	126,000
30% post-consumer (reams)	246,000	222,000	201,000
100% post-consumer (reams)	12,000	15,000	14,000
Total (reams)	408,000	380,000	341,000
Traditional paper (tons)	375	358	315
30% post-consumer (tons)	615	555	503
100% post-consumer (tons)	30	38	35
Total (tons)	1,020	950	853

Normalized office paper purchased	**2002**	**2003**	**2004**
Traditional paper (reams/CPE)	2.06	1.89	1.64
30% post-consumer (reams/CPE)	3.37	3.06	2.62
100% post-consumer (reams/CPE)	0.16	0.20	0.18
Total (reams/CPE)	5.60	5.15	4.44
Full-year student equivalents	56,261	58,729	60,203
Full-time staff equivalents	16,653	17,012	16,656
Campus person equivalents	72,914	75,741	76,859

Paper-related greenhouse gas emissions	**2002**	**2003**	**2004**
Traditional paper (lbs CO_2/CPE)	2.92E+01	2.68E+01	2.33E+01
30% post-consumer (lbs CO_2/CPE)	4.26E+01	3.70E+01	3.31E+01
100% post-consumer (lbs CO_2/CPE)	1.47E+00	1.80E+00	1.63E+00
Total (lbs CO_2/CPE)	7.33E+01	6.57E+01	5.80E+01

Paper-related energy usage	**2002**	**2003**	**2004**
Traditional paper (BTUs/CPE)	1.98E+05	1.82E+05	1.58E+05
30% post-consumer (BTUs/CPE)	2.82E+05	2.45E+05	2.19E+05
100% post-consumer (BTUs/CPE)	8.91E+03	1.09E+04	9.86E+03
Total energy consumed (BTUs/CPE)	4.89E+05	4.38E+05	3.86E+05

Paper-related wood usage	**2002**	**2003**	**2004**
Traditional paper (lbs wood/CPE)	3.57E+01	3.28E+01	2.84E+01
30% post-consumer (lbs wood/CPE)	4.09E+01	3.56E+01	3.18E+01
100% post-consumer (lbs wood/CPE)	0.00E+00	0.00E+00	0.00E+00
Total usage (lbs wood/CPE)	7.66E+01	6.83E+01	6.02E+01

Part 4
Pollution Prevention Activities during the Fiscal Year 2005

Part 4 contains information about the pollution prevention activities practiced by the participating agencies. The information is organized 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 (Admin) – The Materials Management Division in conjunction with Mn/DOT has a contract for *Hazardous Materials: Used Oil Sorbent and Filter Management for Energy Recovery*. One contractor burns the burnable sorbents for energy recovery. The other handles non-burnable used oil sorbent materials that are generally clay and diatomaceous earth. The clay and diatomaceous earth are reused by extracting the used oil with the oil burned for energy recovery. This contract is available to other state agencies and members of the Cooperative Purchasing Venture.

Department of Corrections (DOC) – Multiple facilities use a state-approved vendor for disposal and recycling of these materials to help ensure proper handling.

MCF-Redwing – Absorbents are used on a limited basis in the automotive shop. This waste material is burned at the city of Red Wing incinerator.

Iron Range Resources and Rehabilitation Agency (IRRR) – The IRRR does not use clay absorbents at its facilities. Our shop staff members use rags for oil changes and vehicle lubrication.

Metropolitan Airports Commission (MAC) – The 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 the 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. The sorbents are saturated as much as possible before disposal, and then managed as a nonhazardous industrial waste and burned for energy recovery.

Metropolitan Council Environmental Services (MCES) – MCES uses absorbents primarily on hydraulic fluids, crankcase oils, and other lubricating oils. The larger facilities send used bulk paper-based or polypropylene pad absorbents via OSI Environmental, Inc. or Rock Oil 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. Two facilities send clay-based absorbent to CRI Recycling Service for cleaning and reuse. Another facility has analyzed its used absorbent for Toxicity Characteristic Leaching Procedure heavy metals. Since none of the listed thresholds were exceeded, the absorbent is handled along with industrial waste (grit) with the approval of the regulating county. For 2004, 935 gallons of used absorbents were sent for energy recovery or recycling, an increase of 31 percent from 2003.

Metropolitan Council Metro Transit – 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. An in-house comparison of absorbents validates the effectiveness of the selected absorbents. The current absorbent is collected in 55-gallon drums

after use and sent to a processing company that removes the oils from the absorbent and returns the "cleaned" product to the garage. The change has eliminated over 8,000 pounds of clay from the waste stream.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – ATC uses absorbents primarily on hydraulic fluids, crankcase oils, and other lubricating oils. Absorbents used include pads, socks, and granular absorbents. They are used in the Diesel, Marine and Small Engine campus garages, Maintenance, and Warehouse departments. Our Diesel Shop has piloted a study on using a lava ash absorbent instead of a clay-based absorbent, which has resulted in reduced waste material, the amount of time that the material must lay on the oil, and cost.

Dakota County Technical College (DCTC) – DCTC does not use clay-based floor dry at our facilities. We use a cellulose type of absorbent. All used products are incinerated. Our college mechanic uses rags that are laundered.

Hennepin Technical College, Brooklyn Park – Absorbent pads and socks are currently used in the Automotive, Auto Body, Marine and Recreation, Fluid Power, Machine Shop, and Heavy Truck Departments. They are also used in the Maintenance Department. All used pads and socks are incinerated.

Minnesota State University, Moorhead (MSUM) – MSUM continues to use cloth-type pads and drip pans whenever possible. Absorbents (cloth-type rags, pads, and socks) are used primarily in Printing Services, Physical Plant, and Department of Art and Design.

Northwest Technical College, Bemidji – Automotive and Automotive Machine programs use absorbents that are recycled.

Riverland Community College, Albert Lea and Austin – It is the college's ongoing policy to use absorbents for clean-up and leaks that can be rung out and reused. The liquid is collected and disposed of as appropriate.

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 (Mn/DOT) – The sorbents currently used are either disposed of as a waste-derived fuel for the generation of steam and electricity, or extracted and reused. Mn/DOT continues, on a small scale, to use launderable rags. Mn/DOT reuses its sorbents, since it 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 – The Vehicle Fleet Operations use absorbent pads to clean up small routine spills, in place of and/or in combination with floor dry. The pads are laundered and reused. Absorbent disposal has been cut by five to 10 drums per year.

Printing and Graphic Arts uses rags for printing operations cleaning ,and Studio Arts uses rags for cleaning in painting and other art techniques. The rags are centrifuged to remove solvents as needed and then laundered for reuse. Laundering of rags provides a distinct financial advantage to disposing of the rags as hazardous waste.

2. Adhesives

Department of Administration (Admin) – The State Architect Office specifies materials such as fiber-based fabrics, adhesives, carpeting, and upholstery that are free of toxins and formaldehyde.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Adhesives are used by the Facilities Maintenance, Carpentry, Art, and Interior Design Departments. Adhesives are used in a manner to reduce waste and exposure. MSDS sheets are retained for each adhesive product used at our sites.

Hennepin Technical College, Brooklyn Park – The adhesives used in the carpet replacement at Hennepin Technical do not generate any hazardous toxins or vapors.

Minnesota State University, Moorhead (MSUM) – MSUM currently enforces the use of only low- or no-VOC products within buildings, to primarily accommodate people with indoor air sensitivities. Products containing VOCs are reviewed prior to use by the Department of Environmental Health and Safety so that proper arrangements can be made to minimize personal exposure and indoor air pollution. Contractors are educated on the Indoor Air Sensitivity Program and are expected to comply.

St. Cloud State University (SCSU) – As a matter of practice, SCSU contractors are required to use adhesives that do not generate hazardous vapors. This is not always possible to enforce as often as we would like; specific products that provide superior adhesion are sometimes warranted. But we keep reducing their usage as we find alternatives. The primary goal is to employ a product that will not produce volatile organic compounds (VOCs) that may cause temporary air quality concerns with building occupants.

North Hennepin Community College (NHCC) – 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 handled correctly to avoid being wasted.

3. Air Quality, CFCs

Department of Administration (Admin) – The State Architect Office specifies air quality standards as well as statewide asbestos control programs based on federal and state standards. The Plant Management Division retrofitted one existing chiller at the History Center with non-ozone-depleting 134a refrigerant.

Department of Corrections

MCF-Rush City – A refrigerant reclaimer is used to reclaim Freon. A certified staff person on applicable refrigeration and air conditioning units uses the reclaimer. We also installed a crankcase ventilation filter system on our two diesel generators. This helps remove harmful contaminants that can pollute the environment.

Department of Employment and Economic Development (DEED) –The following energy/pollution reduction actions were performed prior to our central office relocation to the leased space within the First National Bank Building:

- Air quality checks were performed to ensure that air quality standards were being met.
- Use of low-VOC (volatile organic compounds) paint was used to paint interior walls.

Metropolitan Airports Commission (MAC) – 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 Metro Transit – 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 was given a Class D air permit for its new garage in St. Paul. 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.

In 2002, Metro Transit received delivery of its first hybrid bus. This bus uses electric drive motors to power the bus. The electricity is produced by a small diesel engine that is also used for acceleration. In 2003, the agency received two additional electric hybrid buses. These will be tested for the next year, and a report will be issued in on the feasibility of this style bus in our environment. Metro Transit is currently planning to increase its hybrid fleet. Also, Metro Transit is acquiring and using electric hybrid cars in its fleet for staff use. Currently Metro Transit has five of these vehicles in its fleet.

Metro Transit has started a program to burn low sulfur fuels in its entire fleet. In 2004 Metro Transit was fueling half of the bus fleet with this low sulfur diesel. In July 2005, all buses in the Metro Transit will be switched to this low sulfur diesel fuel.

Department of Military Affairs – The Minnesota Army National Guard (MNARNG) has CFC-reclamation equipment in place and certified personnel operating the equipment.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – As HVAC funds become available, Freon-based cooling units are replaced with roof-mounted, energy-efficient cooling systems further reducing the potential for CFC emissions. Maintenance performed on any system containing CFCs includes complete recovery and recycling of refrigerants by licensed, certified service technicians.

Hennepin Technical College, Brooklyn Park – Air quality sampling has been performed on both campuses. In renovated or new construction areas, we have purchased higher efficiency air handling units. CFC refrigerant that is used in our chiller plant is R-123. Leaks or repairs that need to be done are taken care of by a qualified contractor.

Minnesota State University, Moorhead (MSUM) – All air handling units/heating systems and drains are routinely inspected and maintained. Maintenance performed on systems containing CFCs are conducted by certified technicians. CFCs are completely recovered, recycled, and documented. Appliances containing CFCs are recycled through approved vendors.

Northwest Technical College, Bemidji – We do not know of any air alert days in our community at the present time.

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

St. Cloud Technical College (SCTC) – In our Automotive Technology and HVAC Technician Programs, students learn to work with refrigerants under direct supervision of the instructor following all regulatory guidelines using proper equipment and reclaiming procedures.

North Hennepin Community College (NHCC) – NHCC considers indoor air quality a high priority. Air quality sampling has been performed on problem/suspect areas, and corrective action is 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 increase fresh air supplied to interior spaces of these buildings.

CFC refrigerants are used on campus in central plant chillers (R-134), and several smaller air-conditioning (R-12) and refrigeration units (R-408, 22). No supplies or stocks of refrigerant are kept on campus. Refrigeration units that are found to be leaking are repaired and retrofitted with a more ozone friendly replacement refrigerant. This type of work is performed by qualified outside contractors.

Department of Transportation (Mn/DOT) – Mn/DOT uses environmentally friendly 134-refrigerant in all vehicle air conditioners. CFCs in Mn/DOT vehicles and building air conditioners are 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 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 down to 280 to 310 tpy, and carbon monoxide (CO) emissions from approximately 280 tpy down to 130 to 150 tpy. Results vary depending on the ratio of fuel types used—gas, coal, and 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.

Reducing steam and electrical plant air pollution by conserving energy is a goal of Facilities Management Energy Systems' Energy Efficiency Program. The mission of the Energy Efficiency Program is to reduce the Twin Cities campus energy consumption while maintaining or improving occupant comfort. Three components are: 1) optimum energy management; 2) building system analysis, repair, and upgrade; and 3) energy awareness campaign: http://www.facm.umn.edu/energyconservation.html).

Optimizing energy use requires the coordinated effort of many Facilities Management staff, including building system technicians, engineers, pipefitters, 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, 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 energy managers 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 optimization practices across the Twin Cities campus. Their efforts have reduced steam use on the Twin Cities campus central steam system by 24.6 percent, which translates to a corresponding reduction in steam plant air emissions. Through energy optimization and the Energy Efficiency Program, overall energy consumption has decreased 17 percent since 1994, with energy cost savings of $2.8 million. 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.

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). The center's 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 university's Facilities Management has an ongoing program to capture and reclaim CFC and HCFC from cooling units. As units are serviced, their CFCs/HCFCs are captured, and then placed back in the units after service. 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.

The campus bus routes and schedules are routinely evaluated and optimized by the Department of Parking and Transportation Services in an effort to more effectively serve the riders while minimizing congestion on the urban campus streets, fuel consumption, and air pollution as buses sit in traffic. Since 2001, these efforts have reduced bus miles traveled by over 200,000 miles annually, which translates into conserving over 10,000 gallons of fuel and significant reduction in air pollution.

With the heating plant modifications, there is a reduction of approximately 1,560 to 1,680 tpy of SO_2, 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 program to capture and reclaim CFC and HCFC reduces emissions of global warming chemicals.

4. Antifreeze

Department of Administration (Admin) – The Travel Management Division replaces antifreeze as needed, rather than as scheduled maintenance. Used antifreeze is collected and recycled. The Plant Management Division completed the conversion of cooling coils at the all Capitol Complex Buildings to prevent freeze-ups using air from the air handlers rather than antifreeze. The Plant Management Division also collects and recycles antifreeze on a voluntary program.

Department of Corrections (DOC) – Multiple facilities recycle antifreeze with local vendors.

Iron Range Resources and Rehabilitation Agency (IRRR) – The IRRR collects antifreeze and then sends it to Como Oil of Duluth for recycling.

Metropolitan Airports Commission (MAC) – The 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 Metro Transit – Metro Transit has long had a formal policy on the handling of all used antifreeze/coolant. The policy calls for storing the used material in 300-gallon containers that are located at each facility and then having the coolant recycled. This procedure has been in place since the mid 1990s.

Department of Military Affairs – The Minnesota Army National Guard recycled approximately 1,000 gallons of antifreeze last year. There are two recycling options available for used antifreeze:

- antifreeze can be kept on site and a vendor contracted to recycle the antifreeze.
- antifreeze can be sent to Camp Ripley for a vendor to recycle.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Antifreeze is used mainly in the Diesel Mechanic, Marine and Small Engine and Truck Driving programs and is collected and recycled. Our fleet vehicles are maintained by an independent contractor who collects and recycles antifreeze when it is replaced in vehicles on an as-needed basis.

Central Lakes College, Brainerd and Staples – Central Lakes College has a agreement with Safety Kleen to recycle our antifreeze.

Dakota County Technical College (DCTC) – DCTC collects all used antifreeze in a 55-gallon drum, and Edel

Oil picks it up for recycling.

Hennepin Technical College, Brooklyn Park – This product is used by the automotive and maintenance departments. The Maintenance Department uses antifreeze to winterize the cooling coils. It is recycled through Recycool Inc., located in Hugo.

Minnesota State University, Moorhead (MSUM) – All antifreeze products are recycled by contract with a local reclamation service.

Northwest Technical College, Bemidji – Our Automotive and Automotive Machine programs have purchased and are using an antifreeze recycling machine.

St. Cloud State University (SCSU) – SCSU is moving away from using antifreeze to winterize cooling coils and is using more controls to reduce fleet use of antifreeze.

Department of Natural Resources (DNR) – DNR shops store their used antifreeze in a barrel until the barrel is full, then the antifreeze is recycled. The quantity of used antifreeze produced by DNR shops is small, as it takes the larger shops more than a year to fill a 55-gallon barrel. The total yearly quantity for DNR shops would be less than 100 gallons.

North Hennepin Community College (NHCC) – The college no longer uses antifreeze to winterize cooling coils. A different method has shown favorable results and will be continued. Small quantities of automotive antifreeze from lawn equipment are brought to a local recycler.

Department of Transportation (Mn/DOT) – Most of Mn/DOT is using an extended life coolant when a system needs to be flushed. The extended life of the coolant protects the cooling system for 600,000 miles or twelve years. Most of Mn/DOT does not produce significant amounts of antifreeze. If a part needs to be changed, the old antifreeze is collected, temporarily 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.

University of Minnesota – The university's Fleet Services Department, Twin Cities campus, rarely removes automotive antifreeze; rather they top off radiators with fresh antifreeze, and then sell vehicles after three to five years. The small amount of antifreeze collected is periodically regenerated on-site by outside contractor.

5. Audits

Department of Corrections

MCF-Rush City – Rush City's 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.

Metropolitan Airports Commission (MAC) – The MAC continues 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. Reliever airport tenants must pass an environmental compliance inspection in order to transfer or renew a lease. It is also an opportunity for the MAC to educate its tenants on the environmental impacts their actions may have, and to help them improve their waste management practices. Opportunities for pollution prevention are noted and incorporated in the Capital Improvement Process as indicated by the 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.

Department of Military Affairs – Three separate audit visits occur at Minnesota Army National Guard (MNARNG) facilities. The first is an Internal Performance Assessment System (IPAS) environmental audit.

The IPAS audits are performed by full-time staff. The audits are designed to ensure that all regulatory requirements are met at each facility. Deficiencies are noted and immediately remedied if possible. Follow-up is conducted to verify that any outstanding deficiencies were remedied in a timely fashion. Last year, all MNARNG facilities were visited by IPAS inspectors. This initiative is generally referred to as Project SAVER (Site Assistance Visits Environmental Requirements).

The second audit, the Minnesota Organizational Readiness Evaluation (MORE) is conducted by the MNARNG Logistics Office. The MORE audits material procurement and shelf life. The third audit, performed every four years by the National Guard Bureau (NGB), is called an Environmental Performance Assessment System (EPAS) inspection. The EPAS reviews the MNARNG's environmental program and policies to determine compliance with all regulatory requirements. The EPAS also does spot checks on environmental regulatory compliance at individual MNARNG facilities. The next scheduled audit for the MNARNG is in 2008.

Minnesota Pollution Control Agency (MPCA) – In May of 2003, the Minnesota Pollution Control Agency (MPCA) renegotiated its lease on the 520 Lafayette Road Building in St. Paul. As part of that lease, the MPCA required a commercial energy audit of the entire building. The MPCA will detail the result of this audit in next year's report.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Audits mandated by OSHA, RECA, and the MPCA are conducted and recorded as outlined in the regulations.

Dakota County Technical College (DCTC) – MacNeil Environmental performs monthly inspections as part of their environmental health and safety contract with DCTC.

Minnesota State University, Moorhead (MSUM) – Currently, MSUM is undergoing a university-wide energy audit. Energy Services Group will be examining electricity use in both indoor and outdoor lighting. They will also be assessing the steam heating system for steam traps, and performing a first-ever water usage audit. Goals include being able to reduce outdoor lighting needs for at least a few hours during the night and implementing motion sensors indoors to save energy. The audit will produce written quantifiable data that will help the university make improvements throughout all facilities. This data is expected to be completed in the fall of 2005 and will be included in the 2006 pollution prevention summary report for MSUM.

The Department of Environmental Health and Safety and Physical Plant staff periodically conduct audits of university facilities. These audits cover areas such as hazardous waste, storm water management, laboratory procedures, and energy consumption. Individual departments are also asked and encouraged to self-audit periodically.

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, storm water, and the OSHA laboratory standard, which encompass pollution prevention. The SCSU Chemical Hygiene Officer has received specialized off-site laboratory safety training this past year. He 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 has continued to implement the suggestions of the latest Minnesota State Colleges and Universities (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) – 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 throughout the department.
- 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 five to 10 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.
- 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's 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 Department of Environmental Health and Safety (DEHS) does targeted audits of large and/or non-compliant departments. All chemical waste generators are directed to minimize waste and prevent pollution via training and self-audit. The training and audit form is currently available on the DEHS home web page (http://www.dehs.umn.edu/hwd/guidebook/guidebook8.html) and in the *Hazardous Chemical Waste Management* guidebook.

6. Automotive Fuels

Department of Administration (Admin) – The state purchased 221 alternative fuel vehicles that use E85 (85 percent ethanol fuel) in 2003 (170 passenger cars and 51 bi-fuel passenger vans/SUVs). We exceed the federal requirement of 75 percent E85 vehicles. Materials Management Division is in the process of reviewing all state fuel contracts to determine whether low sulfur is available and can be added to the contract as a less polluting option for end users. The Travel Management Division (TMD) uses E85 fuel as an alternative energy source with reduced emissions. This fuel is available to all state agencies and political subdivisions. The TMD facility has one 2,000-gallon bulk fuel tank used for dispensing E85 fuel. Vehicles at the TMD facility, as well as state vehicles operated in the vicinity of the TMD facility, used 7,736 gallons of E85 from this bulk tank in FY 2004. PMD has purchased three E85 vehicles as replacement vehicles and purchase 87.55 gallons of E85 fuel.

While there are issues with reporting and tracking retail E85 purchases, we are committed to implementing this tracking. We believe that tracking E85 purchases will help agencies know when they are in compliance with Minnesota Statute § 16C.135, which requires the use of E85 in many circumstances.

Department of Agriculture (MDA) – The MDA continues to help promote the use of alternative fuels through their work with the farm community in the production of ethanol-blended and bio-diesel fuels. For further information, go to the department's website at www.mda.state.mn.us/. The MDA had a total of 98 E85 vehicles in their fleet out of a total of 133 vehicles during fiscal year 2005. The total E85 fuel consumed by these vehicles during fiscal year 2005 was 4,574 gallons. E85 vehicle and fuel data from fiscal year 2004 was unavailable from Travel Management Division.

Bemidji State University (BSU) – Bemidji State University has 56 maintenance and fleet vehicles. Three of these vehicles are flexible fuel vehicles. None are operated on E85 fuel due to limited availability of the fuel in our region, decreased range of travel, and manufacturers' cautions about performance issues during periods of extreme cold and heat. Bemidji State University continues to operate two battery-powered maintenance vehicles that were purchased to replace two full-sized vans. Annual fuel savings are expected to be about $400.

Department of Commerce – Currently the department has 48 total vehicles, of which 18 are leased through the Department of Administration and 31 are owned directly by the department. Three vehicles are E85 capable. The department does not fall under U.S. EPA act. The department's ability to track E85 fuel use in department-owned vehicles is similar to the issues that other agencies face, and it is not practical to calculate the data by hand.

Department of Corrections (DOC) – Four facilities, the Central Office, and Field Services reported the use of E85 vehicles in their automobile fleets. While actual E85 fuel usage amounts could not be obtained, 83 of 216 (38 percent) vehicles were reported to be E85 capable.

MCF-Faribault – Purchased One 2005 Chevrolet half-ton extended cab pickup while removing four vehicles to auction, these four vehicles included two light-duty pickups, one van, and one passenger car. The corresponding reductions to CO, NOx, PM, and VOCs can be found on the attached "Submittal Worksheet."

MCF-Red Wing – Has three E85 vehicles and 12 non-E85 vehicles. We use E85 fuel where available. In addition, fueling of state vehicles is done at this facility. There is a 1,000 gallon above-ground concrete tank with spill containment and leak detection.

MCF-Rush City – E85 is not currently available at local stations.

Department of Employment and Economic Development (DEED) –As referenced in Part 2 of this report, we have recommended through policy changes that employees traveling on business purchase the cleanest fuel possible when using DEED-owned vehicles.

Office of Environmental Assistance (OEA) – Both of OEA's vehicles use E85, and staff is encouraged to use E85 fuel.

Iron Range Resources and Rehabilitation Agency (IRRR) – Diesel fuel and gasoline are stored in underground storage tanks (new in 1999) at the agency's administration building. Iron Range Resources uses a blend of ethanol and gasoline in all of the motor pool and agency vehicles. The agency is currently using 31 passenger vehicles: 10 are owned by the agency and 21 are leased from the TMD (Travel Management Division) in St. Paul. Twelve of these vehicles are flex-fuel vehicles.

The closest service station that has E85 fuel is in Duluth, which is 60 miles from our agency. The agency has fuel tanks for unleaded gas and diesel fuel but does not have a state contract available for E85 fuel. That is, there is no bulk supplier in the vicinity that has this product available. The new tanks are equipped with computerized leak detection and spill containment devices.

Metropolitan Airports Commission (MAC) – MAC has 215 licensed vehicles, of these one is an E85 vehicle. MAC purchased 148 gallons of E85 in 2005, up from 2004 when no E85 was purchased. Bio-diesel has not yet been used in the MAC fleet.

Metropolitan Mosquito Control District (MMCD) – As a pollution prevention activity to reduce air pollution under the requirements of the Executive Order 04-08, MMCD adopted the following policy regarding the operation of district-owned vehicles:

> *Vehicles owned and operated by the district must refuel with the cleanest, least polluting fuel available. MMCD requires that E85 flex-fuel vehicles in the district fleet must refuel with E85 fuel whenever possible and non flex-fuel vehicles in the district fleet must use gasoline that is low-sulfur and low-benzene whenever possible.*

For this reporting period, MMCD has used 27,921 gallons of automotive fuel. Of that total, 1,131 gallons (4 percent) was E85 fuel and 23,512 gallons (84 percent) was low-sulfur, low-benzene (Blue Planet) fuel. While pleased with the overall results, the district had hoped to see more E85 fuel used in 2005 with the addition of 18 flex-fuel vehicles to the fleet. One reason for the low percentage of E85 fuel usage is the lack of availability of E85 near district facilities. Some outlying facilities found it difficult to find E85 fuel within a reasonable traveling distance from the garage areas for the flex-fuel vehicles. In those situations, the vehicles were fueled with a low-sulfur, low-benzene fuel whenever possible. Additionally, two district facilities have underground tanks used for fueling their fleet vehicles. Since the older non-flex-fuel vehicles can't use E85, the district compromised and used a low-sulfur, low-benzene fuel in those facilities. The district's current fleet consists of 26 flex-fuel Chevy Silverado half-ton pickups and 189 non-flex-fuel vehicles.

The table below illustrates MMCD's reduced tailpipe emissions for the 2005 report.

2005 TOTAL EMISSIONS REDUCTION (IN POUNDS)

CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
7,245	28,991	0	478	2.3	1.3	2.2	685

Metropolitan State University – Total automotive fuel purchased was not available at the time this report was completed.

Department of Military Affairs – In FY 2004, the Minnesota Army National Guard recycled approximately 3,000 gallons of contaminated diesel fuel. The diesel fuel was recycled and reused.

Minnesota Pollution Control Agency (MPCA) – The Minnesota Pollution Control Agency (MPCA) has 64 flex-fuel vehicles and three alternative vehicles. In 2004, Commissioner Sheryl Corrigan sent an e-mail to all staff with a challenge and a goal: she asked staff to fill up with E85 fuel 50 percent of the time. Currently, the MPCA is averaging about 30 to 40 percent each month in 2005, compared to 24 percent in 2004, 17 percent in 2003, and 12 percent in 2002. The MPCA has taken a couple of steps to help encourage staff. The MPCA continues to audit 10 percent of the flex-fuel vehicles to find out if staff are using regular gas when E85 is available at a gas station. If the audit shows that a staff member did not fuel with E85, his/her supervisor is contacted and asked to talk to the staff member in question. A binder of E-85 fueling stations is in each vehicle and updated quarterly. The MPCA will continue to take innovative and creative approaches to encouraging the use of alternative fuels in all of its vehicles.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – There are no E85 vehicles in ATC's fleet due to the lack of availability of a local E85 fuel source. Should an E85 source become available locally, ATC's fleet manager will evaluate the feasibility of using this fuel source for our fleet.

Central Lakes College, Brainerd and Staples – Central Lakes College purchased three vehicles that use E85 fuel from Travel Management.

Hennepin Technical College, Brooklyn Park – Gasoline for the grounds equipment and for college-owned vehicles is stored underground. There are two 1,200-gallon tanks at EPC and one 1,000-gallon tank at BPC. The # 2 fuel oil for the boilers is stored in one 20,000-gallon tank at EPC and in two 25,000-gallon tanks at BPC. Hennepin Technical has a total of 30 vehicles in which we use a 10 percent blend as of right now.

Inver Hills Community College – Steps have been taken to purchase and continue to use vehicles that are most efficient and have a high miles-per-gallon ratio. Inver Hills vehicle is fueled using clean E85 fuel.

Mesabi Range Community and Technical College – The college leases two mini vans that use E85 fuel, and employees are encouraged to purchase this fuel when available.

Minnesota State Community and Technical College, Fergus Falls Campus – A fuel vendor in Fergus Falls has, within the past few months, begun to dispense E85 fuel. We have begun a renewed effort to educate employees to refuel with this grade.

Minnesota State Community and Technical College, Wadena Campus – We have replaced one leased vehicle through Travel Management and do not have information on fuel efficiency

Minnesota State University Moorhead (MSUM) – The automotive fleet is available to faculty, staff, and a large number of students. Due to the broad nature of vehicle use and the lack of area stations providing E85, it is difficult for the university to monitor the amount of E85 fuel purchased. The fleet includes seven sedans, two minivans, and six 12-passenger vans. Two sedans and two minivans are equipped for E85 use. The use of E85 fuel is encouraged, but unfortunately at this writing cannot be monitored. To help reduce emissions and save energy, MSUM recently purchased a GEM E-4 electric car for use on the main campus by the Physical Plant staff. The cost to operate is approximately $30 per year, averaging 50 miles per week, whereas a gas automobile would require a cost of approximately $400 for the same use. During summer months, bio-diesel is used in the Physical Plant's lawn tractors, skidsteer and pay loader equipment, trucks, and other heavy equipment. During winter months these same vehicles are fueled with low-sulfur diesel fuel. The Physical Plant also operates a propane-fueled truck.

Minnesota West Community and Technical College – All Minnesota West fleet vehicles burn 10 percent ethanol or soy-based diesel fuels. We have two vehicles in the fleet that burn E85 fuel.

Northland Community and Technical College – During fiscal year 2005, we have purchased E85 fueled vehicles.

Northwest Technical College, Bemidji – E85 is not readily available in this area.

Riverland Community College, Albert Lea and Austin – Starting in 2005, the Riverland truck driving program began using bio-diesel in one of their trucks. The quantifiable data is included in this report.

St. Cloud State University (SCSU) – SCSU has added two 2005 Taurus alternative fuel (ethanol E85) 5-passenger autos (new total of 18) to their Motor Pool total of 25 vehicles. They produce limited carbon monoxide. Now, university on-site E85 refueling has pumped (within 50 gallons of previous financial year); (about 13,500 gallons) of it for motor pool use this last fiscal year. (The Minnesota Dept. of Commerce/State Energy Office also monitors E85 usage.)

Department of Natural Resources (DNR) – DNR is currently working with Mn/DOT, Admin, and the Minnesota Lung Association to increase use and distribution of E85 and bio-diesel fuels. The website for E85 fuel sites is distributed to all employees. Where clean fuel is not available, we have developed a plan to increase or modify on-site storage at about 40 remote sites across the state.

North Hennepin Community College (NHCC) – Fuel for grounds equipment is stored in an aboveground 285-gallon diesel tank, which has spill containment. Gasoline for small equipment is kept in approved safety cans and stored in an approved safety cabinet. E85 fuels have not been used on our older vehicles.

Department of Revenue (DOR) – The DOR has always had a commitment to reducing waste and pollution. Our vehicle fleet, though small, is made up of vehicles designed for E85, and we encourage our employees to use it.

Department of Transportation (Mn/DOT) –Mn/DOT's purchase of E85 fuel is increasing annually; 349 gallons in FY 2003, 641 gallons in FY 2004, and 515 gallons in FY 2005. Due to the limited locations of the E85 fuel pumps (but improving every year), 19 percent loss of fuel efficiency in the vehicles, and low percentage of E85 vehicles Mn/DOT owns, presently this is not a cost-effective option.

This year the price difference between unleaded gasoline and E85 is widening, making E85 a more cost-effective option. When priced more then $0.35 gallon, to overcome the efficiency loss, Mn/DOT drivers will be advised to use E85 per governor's Executive Order 04-10 and Minnesota State Statute § 16C.135. Mn/DOT met the federal standard for purchasing 75 percent of light-duty fleet as alternative fuel vehicles by December 2004. Mn/DOT currently has 234 E85 capable units. Mn/DOT's heavy equipment is being purchased with computer controlled electronic ignitions that maximizes the vehicles' fuel efficiency. Mn/DOT is pursuing updating its fleet to get more environmentally friendly diesel engines. Mn/DOT has contracted for commercial oil changes specifying re-refined engine oil.

University of Minnesota – The University of Minnesota Fleet Services is an active participant in the E85 fuel project. Department of Fleet Services, Twin Cities Campus, has E85 fueling stations and purchases flexible fuel vehicles (FFV) that can use this environmentally friendly fuel. The university is the greatest user of E85 fuel in the state and nationally.

AUTOMOTIVE FUEL: E85 PURCHASE

	FY 2003	FY 2004	FY 2005
Total vehicles	795	830	835
E85 vehicles	42	38	71
E85 percent of fleet	5.28	4.58	11.8
Hybrid vehicles	3	4	14
Gallons of E85 purchased	19,867	18,636	16,997

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 Toyota Prius hybrid electric/gasoline cars and Ford Escape hybrid SUVs. The hybrids have an electric motor, which is assisted by a clean, efficient gasoline engine for hard accelerating, higher speeds, and battery charging. Prius's fuel efficiency is 42 miles per gallon overall versus 28 miles per gallon for the fleet's other compact cars.

The Power and Propulsion Division, Department of Mechanical Engineering, 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 (http://www.me.umn.edu/labs/pp/index.shtml). The Center for Diesel Research (http://www.me.umn.edu/centers/cdr/index.html) is a good resource for information on test procedures and simple maintenance that can greatly reduce diesel emissions from buses and trucks. Proper choices and use of fuels can help reduce air emissions from automobile and bus exhausts and reduce fuel consumption.

7. Automotive Maintenance

Department of Administration (Admin) – The Travel Management Division recovers and recycles automotive refrigerants for air-conditioning units. Both the Travel Management and Plant Management

Divisions' preventative maintenance programs are designed to minimize excessive and/or premature replacement of parts. They also use remanufactured parts whenever available.

Department of Commerce – The department-leased vehicles receive maintenance through the Department of Administration Travel Management Division service schedule. Department-owned vehicles are maintained by private businesses under contract.

Department of Corrections

MCF-Rush City – All maintenance is done by an outside vendor that handles all the appropriate recycling.

Iron Range Resources and Rehabilitation Agency (IRRR) – All automotive maintenance, except for air conditioning systems, is performed in the IRRR shop at the administration building. Vehicle fluids are stored for recycling and parts are exchanged for remanufactured parts. All metal that cannot be exchanged is recycled by a scrap metal facility.

Metropolitan Airports Commission (MAC) – Several vehicles were upgraded in FY 2005, affording emission reductions associated with increased fuel economy.

- 1989 F450 diesel replaced by 2005 F550 diesel

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	NOx	PM10	PM2.5	VOC
17.328	79.733	10.422	9.590	11.617

- Two 1993 K1500 replaced by two 2005 F350s
- 1991 Explorer replaced by 2005 F150
- 2001 Crown Victorias (two) replaced by two 2005 Crown Victorias
- 2003 Impala replaced by 2005 Crown Victoria
- 2002 Intrepid replaced by 2005 Crown Victoria
- 2001 Explorer replaced by 2005 Durango
- 1996 Intrepid replaced by 2005 Jeep Liberty
- 1998 Windstars (two) replaced by two 2005 Durangos
- 1997 Expedition replaced by 2005 Dakota

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	NOx	PM10	PM2.5	VOC
7449.566	557.644	1.459	1.307	448.104

Metropolitan Mosquito Control District – As a pollution prevention activity for 2005 and to reduce air pollution under the requirements of the Executive Order 04-08, MMCD purchased 18 new flex-fuel vehicles (FFV) capable of using E85 to replace 15 older fleet vehicles. All new vehicles purchased by MMCD in 2005 were flex-fuel Chevy 1500 Silverado half-ton pickups. The FFV Chevy Silverado was on MPCA's list of recommended vehicles for fuel efficiency and reduced amount of pollutants for standard size pickups. Using the Emissions Reduction Workbook provided by IPPAT, the older vehicles were entered as baseline vehicles and the new FFV pickups as current vehicles. A reduction total was calculated comparing the older vehicle emissions to the new FFV emissions totals. By eliminating the 15 older vehicles from the fleet and replacing them with new vehicles, the district was able to achieve substantial reductions in tail pipe emissions.

2005 TOTAL EMISSION REDUCTIONS FOR GASOLINE VEHICLES (IN POUNDS)

CO	CO_2	NOx	PM10	PM2.5	SO_2	VOC
7,244.754	28,991.086	477.996	2.323	1.288	2.224	685.207

The only real problem MMCD experienced with the FFV trucks was the availability of E85 fuel near district garage facilities. The outlying facilities found it very difficult to find E85 fuel within a reasonable traveling distance from the garage locations. If flex-fuel vehicles are to become an effective tool for reducing tail pipe emissions, more work needs to be done to improve the availability of E85 fuels in the seven metro counties.

By using FFVs to replace older vehicles in the district fleet, MMCD hopes to reduce tailpipe emissions that contribute to urban air pollution and ultimately to global warming. MMCD is committed to reducing pollutants generated by its vehicle fleet and plans to continue replacing older fleet vehicles with more efficient, cleaner running flex-fuel vehicles in the future.

Department of Military Affairs – Camp Ripley Training Site serves as a major training area for National Guard and other DOD units from throughout the nation. The Maneuver Area and Training Equipment Site serves as a facility within the Camp Ripley Training Site where units can obtain equipment while they are at Camp Ripley for annual training periods and weekend drills. The MNARNG "mothballs" a portion of its fleet in controlled humidity storage buildings when not in use. These buildings allow the MNARNG to store vehicles inside, out of the elements, and allow the vehicles to remain operational.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Automotive maintenance and repairs are performed by local vendors who recycle oil, oil filters, batteries, and air-conditioning refrigerants. ATC coordinates vehicle replacements through the state vehicle leasing program. During 2005, our Dodge Intrepids are scheduled for replacement with more fuel-efficient models.

Dakota County Technical College (DCTC) – Some college-owned automotive maintenance and major vehicle repairs are performed by auto dealerships. Preventative maintenance on trucks and lawn equipment such as oil and filter changes are performed by qualified staff on campus. The used oil, filters, and antifreeze are sent to a local recycler.

Minnesota State University, Moorhead (MSUM) – Automotive fleet maintenance is primarily conducted by off-campus vendors. Any on-campus maintenance is conducted in the Physical Plant's auto mechanics shop. All used oil, filters, and antifreeze are recycled by local vendors. The university also uses a citrus-based environmentally friendly parts washing fluid in its auto mechanics shop.

Minnesota West Community and Technical College – Since 2000, Minnesota West has reduced the number of vehicles in the fleet by more than 40.Last year, the college removed 10 older vehicles from our fleet and purchased two newer vehicles: a 2002 Chevy Silverado pickup and a 2004 Chevy Venture van.

Northwest Technical College, Bemidji – We have reduced our fleet of travel vehicles from 11 down to five in the past two years because of off-campus meeting reductions and the promoted use of electronics for meetings and communication. Three of the five remaining vehicles in the line-up are E85 rated but due to the lack of locally available E85 fuel, this has not been a pollution reduction for us. The vehicles are tuned and maintained on a regular basis and all pollution control equipment is maintained for peak operating efficiency. Reduction in travel has been substantial, but has not been tracked or substantiated due to staff and budget reductions.

Pine Technical College, Pine City (PTC) – PTC committed, under Executive Order 04-08, to reduce its pollution impact by purchasing fuel-efficient and less-polluting vehicles, should it replace either of its college vehicles in FY 2005. Because of budget restraints, the college was unable to replace either of those vehicles.

St. Cloud State University (SCSU) – The SCSU vehicle repair shop has revamped procedures for brake pad/shoe replacement to ensure asbestos fiber release control. Replacement pads are non-asbestos. The

Diesel Repair, Locksmith, Plumbing, Print, and Driving Range shops have been using a water-based parts washer that generates only a small amount of sludge to be disposed of as hazardous waste.

North Hennepin Community College (NHCC) – Major vehicle repairs are performed by auto dealerships. Minor maintenance such as oil and filter changes are performed by qualified staff on campus. The used oil, filters, and antifreeze are recaptured by staff and sent to a local vendor for recycling.

Department of Transportation (Mn/DOT) – Mn/DOT is purchasing brake cleaners that are less toxic and easier to manage as a waste. See also sections 24, *Parts Cleaning* and 23, *Oil, Oil Filters.*

University of Minnesota – The Department of Fleet Services, Twin Cities campus, uses a recycling service for their used oil. 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 U.S. EPA requirements, which will prevent contamination from leaking tanks.

Fleet Services has installed 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 or disposal. This system potentially will eliminate 240 gallons of solvent waste per year.

8. Batteries

Department of Administration (Admin) – The Resource Recovery Office informs agencies that the Rechargeable Battery Recycling Corporation (RBRC) has a Charge Up to Recycle!® program that is free of charge to public agencies. Collection kits are available at no cost, and the RBRC will pay for all shipping, materials, processing, and recycling costs. To obtain information and collection kits, call 678-419-9990. The state also has a vendor for recycling rechargeable batteries and has contracts for hazardous waste disposal. Agencies have statutory responsibility to properly dispose of or recycle single-use and rechargeable batteries. The State Recycling Center does not receive batteries in light of these recycling opportunities. 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 Minn. Stat. § 115A.965, subd. 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:
>
> - 600 parts per million by weight by August 1, 1993;
> - 250 parts per million by weight by August 1, 1994; and
> - 100 parts per million by weight by August 1, 1995.

MMD wrote the contracts for the automatic external defibrillators to require the contract vendors to accept the expired rechargeable batteries for recycling. The Plant Management Division returns batteries from vehicles and janitorial equipment to vendors for recycling; the division also participates in all voluntary internal battery collection and disposal program.

Department of Corrections (DOC) – Collects used batteries and returns them to the vendor for recycling when new batteries are purchased.

Department of Commerce – A battery recycling bin is located in the employee lunchroom.

Office of Environmental Assistance (OEA) – The OEA purchases alkaline rechargeable batteries and continues to be pleased with their performance. All rechargeable batteries are recharged as many times as possible and then collected for management by the Department of Administration's Resource Recovery Program.

Iron Range Resources and Rehabilitation Agency (IRRR) – The IRRR collects batteries that cannot be recharged and transports them to the Virginia area regional landfill where they are recycled by Arrowhead Battery of Buhl.

Metropolitan Airports Commission (MAC) – All MAC batteries are recycled. Spent lead-acid batteries are returned to the supplier for recycling. NiCad, NiMH, lithium, and alkaline batteries are collected by MAC electricians from the various points of generation and recycled by an approved vendor.

Metropolitan Council Environmental Services (MCES) – Spent lead-acid batteries (SLABs) 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 2004, 21,481 pounds of SLABs—an 18 percent decrease over the previous year—were recycled from MCES facilities, mostly through A-Battery City in Minneapolis.

Metropolitan Council Metro Transit – Metro Transit continues to recycle all of its spent lead-acid batteries with its supplier. This procedure has been in place since the 1980s.

Department of Military Affairs – The Minnesota Army National Guard (MNARNG) recycled approximately 2,400 lead-acid automotive and truck batteries. The use of solar-powered "trickle chargers" on vehicles that are stored for long stretches of time is being evaluated. These trickle chargers help maintain a charge on batteries during periods of non-use. This has greatly reduced the number of batteries that lose their charge and/or crack during the winter.

Evaluation of the longevity and compatibility of rechargeable dry cell batteries is occurring at one of the MNARNG repair facilities. The evaluation will expand to other repair facilities. The Logistics Branch of the department has established program policy.

Minnesota Pollution Control Agency – There were no source reduction efforts at the Minnesota Pollution Control Agency with respect to batteries, though there were considerable recycling efforts.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – All spent nickel-cadmium, lead-acid, nickel metal hydride, mercury button, and lithium batteries generated at ATC are recycled through approved recycling contractors.

Central Lakes College, Brainerd and Staples – It is an ongoing policy of the college to collect used batteries and dispose of them through a recycling center.

Dakota County Technical College (DCTC) – DCTC collects lead-acid batteries and returns them to the supplier for recycling. We also collect nickel cadmium, nickel metal hydride, mercury button, and lithium batteries and send them to a recycler.

Hennepin Technical College, Brooklyn Park – Automotive lead-acid batteries are recycled through Goose Lake Salvage. All other batteries are recycled through Green Light Recycling in Blaine.

Minnesota State University, Moorhead (MSUM) – All batteries, including lead-acid, nickel cadmium, lithium, mercury oxide, and silver oxide, continue to be collected and recycled. Automotive batteries are changed and recycled through a local dealer. Use of alkaline rechargeable batteries is promoted to those

departments who use large amounts.

Northwest Technical College, Bemidji – All batteries are recycled.

Riverland Community College, Albert Lea and Austin – It is an ongoing policy of the college to collect used batteries and dispose of them through a recycling center.

St. Cloud State University (SCSU) – SCSU stores unreliable automotive lead-acid batteries in a secondary container until recycling pickup and is also recycling smaller sealed lead-acid batteries. Non-special Program hazardous waste type batteries are managed for recycling/reclamation quarterly through Batteries Plus and through the University of Minnesota Chemical Safety Day Program.

St. Cloud Technical College (SCTC) – All batteries are recycled. Every effort is made to ensure that when a new lead-acid battery is purchased, the old one is brought in for exchange. Other batteries are recycled through a local supplier.

Department of Natural Resources (DNR) – DNR shops recycle all of the waste automotive batteries that are produced. The dead batteries are either left with the vendor when the new battery is purchased as per Minnesota requirements or the batteries are taken to a local recycling center.

North Hennepin Community College (NHCC) – All batteries are recycled. Every effort is made to ensure that when a new lead-acid battery is purchased, the old one is brought in for exchange. Other batteries are recycled through a local supplier.

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

University of Minnesota – Facilities Management and the Department of Environmental Health and Safety collect mixed dry cell batteries from all campuses. Several types of waste batteries are considered hazardous waste if not recycled, and most batteries will contribute mercury and other 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.

During fall 2000, Facilities Management and the Department of Environmental Health and Safety reviewed and updated the battery collection program, purchasing new, colorful collection containers and distributing them to all office recycling sites on the Twin Cities campus. The goal was to increase participation in the proper management of dry cell batteries, and indeed the amount of batteries collected increased by 55 percent compared to the previous year, by another 18 percent in the second year, and by 3 percent in the third year.

Rechargeable batteries are sent to RBRC for recycling. All non-lithium button batteries are recycled with mercury and other metal recovery. This is a free service for public agencies and institutions (http://www.rbrc.org/community/index.html).

9. Cleaning Supplies

Department of Administration (Admin) – The Materials Management Division works with the Office of Environmental Assistance in awarding the cleaning supplies contract. Criteria used in this award will provide products to agencies that have less impact on public health and the environment. Each product has been screened to see if it meets environmental criteria in several areas:

- The undiluted product must not be toxic to humans.
- The undiluted product must not contain any ingredients that are carcinogens or that are known to cause reproductive toxicity.
- The undiluted product cannot be corrosive to the skin or eyes.

- The product in its application cannot contain more than 0.5 percent by weight phosphorus to help prevent eutrophication (nutrient loading).
- The product's organic ingredients must be readily biodegradable in water.

Other criteria are being considered to ensure greater safety to state agencies and the environment, including aquatic toxicity, combustibility, skin sensitization, photochemical smog, tropospheric ozone production, and indoor air quality.

Each solicitation responder is required to have their formulations reviewed by an independent laboratory to verify all ingredients found in their products. The Resource Recovery Office uses state contract cleaning supplies from that have high environmental attribute scores and that are in bulk form to minimize waste and packaging. The Plant Management Division uses janitorial products that are appropriate to discard in sewers and buys chemicals packaged as concentrates to reduce packaging waste by 85 percent. The division also uses automatic dispensing systems to ensure correct dilutions from concentrates and minimize waste.

Department of Agriculture (MDA) – The MDA has made a commitment to procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds. The department has done this through establishing specific language in the future cleaning contract and also by sending out a directive to all purchasing agents within the agency. For more information see item f under Part 3*: Quantifiable Measurements for Activities Satisfying Executive Order 04-08.*

Department of Corrections (DOC) – Environmentally friendly products are in use at all facilities. DOC policy helps to ensure the use of the safest possible product, with the lowest potential for generating hazardous waste and polluting the environment. Potentially unsafe products, i.e. hazard rating of more than 0 or 1 on HMIS or NFPA scales, are replaced with a suitable product that will accomplish the same end. Staff places a high priority on using techniques, methods, and products that are nonhazardous or less hazardous, to implement the concept of source reduction.

During FY 2005, the DOC made a switch to an environmentally friendly line of cleaning products through MINNCOR (Green Seal approved). The decision to switch to these products was evaluated with the help of the Office of Environmental Assistance. The corresponding reduction in VOCs could not be calculated as exact amounts and compositions of the materials were not obtained.

Iron Range Resources and Rehabilitation Agency (IRRR) – The shop and custodial staff, as well as the office staff, are made aware that purchasing cleaners through the Environmentally Preferable Purchasing Guide will prove to be cost effective, environmentally safe, and less hazardous to the user. Most of these supplies are available through Central Stores.

Department of Military Affairs – Internal audits of DMA facility cleaning supply storage include a review of shelf life. Whenever possible, the shelf life is extended and products are used up. The DMA utilizes a centralized collection point where soiled rags are exchanged for clean rags. Only rags soiled with POL products are sent off for cleaning; all other rags are managed as hazardous waste.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency Alliance for Recycling and Reduction of Waste, a group of employees who serve as a point of contact for any recycling (reuse, reduce, or rethink) or composting questions, encourages environmentally preferable purchasing whenever possible. This initiative focuses on purchasing products that are nontoxic; water based, and contain recycled or post-consumer material, and have no odors. Products that meet the criteria are placed on list for purchasing specialists who order office and cleaning supplies to reference when ordering.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Environmentally friendly cleaning products are used in many applications throughout the campus. Environmental stewardship is of utmost concern when evaluating

cleaning products for purchase for use on our campus. MSDS sheets for these products are maintained on-site and employees receive training compliant with the Right to Know Act. Products eliminated from our programs are managed through the University of Minnesota Chemical Safety Day Program.

Our Facilities Maintenance Department has converted most of their cleaning products from aerosol sprays to either pump sprays or squirt bottles to reduce our generation of and exposure to VOCs. This has been communicated to our staff so that they may make informed decisions when purchasing these products. One program within our campus has converted from a petroleum-based parts cleaner to an environmentally friendly orange-based cleaner in their parts washers.

Central Lakes College, Brainerd and Staples – Through an ongoing program with vendors and suppliers, biodegradable products are purchased and used at the college. The paper supplies for shop and restroom areas are of the state's highest "green EPA" rating.

Hennepin Technical College, Brooklyn Park – Environmentally friendly cleaning supplies are used at Hennepin Technical College. Supplies are purchased from existing state contracts.

Inver Hills Community College – Our maintenance staff has started using "green" cleaning chemicals to reduce air pollution.

Metropolitan State University – Our policy is to operate "green" facilities. This is currently accomplished by using environmentally friendly products (low-VOC paint and citrus degreaser/cleaner).

Minnesota State University, Moorhead (MSUM) – All buildings are equipped with general cleaning stations involving instruments that accurately dispense the proper amount of a concentrate needed to reduce waste. The campus has moved away from not only low-VOC cleaners, but many of the products in use are actually Green Seal approved. These products help those individuals in the MSUM community who suffer from multiple chemical sensitivities, in addition to being environmentally friendly. To help reduce volume and waste, cleaning supplies that are no longer used by a department are made available for use to other departments. Improvement continues as cleaning supplies become increasingly safer and are being tested and implemented on a regular basis.

Northwest Technical College, Bemidji – We purchase low-VOC cleaning supplies and use water-based paints, floor sealers, and carpet cleaners.

Riverland Community College, Albert Lea and Austin – Through an ongoing program with vendors and suppliers, biodegradable products are purchased and used at the college. The paper supplies for shop and restroom areas are of the state's highest "green EPA" rating.

St. Cloud State University (SCSU) – A SCSU committee has been in place for several years that reviews cleaning products that can be substituted for those that pose a hazard to the employee using them or pose a pollution risk. Cleaning products are purchased in bulk as much as possible and then transferred into hazard labeled reusable/refillable bottles and containers. VOC considerations are very important (as they also are in our painting products).

St. Cloud Technical College (SCTC) – Environmentally friendly cleaning supplies are used. MSDS sheets are maintained in the maintenance office, accessible to all custodians, and safety procedures are adhered to when products are dispersed and used.

Department of Natural Resources (DNR) – The DNR warehouse offers a full line of environmentally friendly cleaners. Division of Parks and Recreation is conducting a study on using environmental friendly janitorial products in the state parks. This will reduce pollutants released in the air, reduce waste by purchasing cleaners in bulk, and protect their staff and the public by reducing the hazardous chemicals they use.

North Hennepin Community College (NHCC) – 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.

Department of Transportation (Mn/DOT) – Mn/DOT uses concentrated cleaners, which allows for the reuse of dispensing containers.

University of Minnesota – Facilities Management (FM), Twin Cities campus, has a program to centralize purchasing of custodial supplies in an attempt to reduce the number of different custodial products used by their employees. The goal was to optimize supply management and to enhance worker safety and environmental friendliness through a product selection process.

FM formed a committee, the Material Review Board (MRB), composed 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. After a successful reduction in 1999 (456 products to 150), the MRB made another impressive stride in FY 2001 by reducing the 150 approved products to 101—a reduction of 33 percent.

The approved custodial list of 101 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 approved products went through a stringent evaluation and testing process. The following is the process when an individual or vendor wants a new product to be considered for inclusion on the approved list. The vendor must first approach the supervisory staff and provide 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 categories of operational safety, ecological (environmental) stressors, product delivery/packaging, and existence of artificial dyes and fragrances. The operational safety category looks at components such as the product's toxicological dosage levels, whether or not it is a registered carcinogen, its pH, and flash points. The ecological (environmental) stressors category looks at if the product were disposed of into the waste stream, what effects would the product's constituent chemicals have on the environment based on a compiled list of products called the Minnesota Toxics Indexing System (http://www.moea.state.mn.us/lc/purchasing/cleaners-criteria-mn.cfm). 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. The delivery/packaging category analyzes whether the product has dispensing features with easy dilution ratios to minimize handling exposure, material handling issues, and the availability of the product's labeling to meet the specification of the Minnesota Employee Right to Know Act. Finally, the 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 testing 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 on the approved list. In order for a new product to get on the approved list, an existing product must be removed.

In addition, the 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. The 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 Commerce

METROPASS AND CARPOOL INFORMATION PARTICIPATION (NUMBER OF EMPLOYEES)

	2001	2002	2003	2004	2005
Metropass	50	47	440	unavailable	39
Carpool	unavailable	unavailable	unavailable	unavailable	9

Department of Corrections (DOC) – All facilities have video conferencing systems that are used to reduce the amount of travel required for meetings.

MCF-Oak Park Heights – Oak Park Heights had over 200 teleconferences for staff training and other meetings.

Department of Employee Relation (DOER) – DOER expects to create an internal web page providing information to employees on alternatives to single-occupancy vehicle commuting. DOER expects to continue the use of WebEx for training and meetings. Historical data suggests that 1,780 state employees drove 400,000 fewer miles during FY 2005.

Department of Employment and Economic Development (DEED) – Efforts were made to further promote alternatives to single-occupancy vehicle commuting within our agency. Our agency currently subsidizes the Metropass program and has for the past several years. Participation in this bus pass program has remained strong, with a participation rate of nearly 20 percent of our employees (20 percent of the whole agency, which includes a large number of employees who don't have access to Metro Transit bus transportation).

Promotion of alternative commuting was further expanded within our agency by providing information to employees about additional methods of commuting, such as vanpooling, carpooling, biking, and walking. Websites accessible to the Interactive Ride Matching E-tool, Cost of Driving Alone Calculator, and the Guaranteed Ride Home Program were also provided.

Office of Environmental Assistance (OEA) – The OEA accommodates 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.

The OEA and MPCA were the first public agencies in the Metropass program in April 1999, and the program continues. 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. Employees are currently paying a larger share of the cost than originally to maintain the subsidy within the agencies' targets for funding. The employee cost is kept below the cost of contract parking.

Iron Range Resources and Rehabilitation Agency (IRRR) – Iron Range Resources employees have formed carpools as an alternative to single-occupancy vehicle commuting. Commuter miles saved total 63,000 annually.

Metropolitan Council Environmental Services (MCES) – The MCES has made several recent pollution prevention improvements to its fleet of approximately 214 passenger and light service vehicles. There are now seven vehicles that can run on E85 fuel in addition to unleaded gasoline. E85 contains 85 percent ethanol, which is distilled from grain such as corn. As a low-emission fuel that is domestically produced, it is beneficial to both the environment and the economy. The models using E85 include Ford Taurus, Dodge Caravan, and GMC Yukon. However due to the limited locations of E85 fueling stations in relation to MCES activities, only one vehicle is consistently fueled with the ethanol blend. The Yukon used 236.5 gallons of E85 in 2004.

The MCES has also purchased two gasoline/electric hybrid vehicles. The Honda Civic hybrids have two motors—one that is powered by an 85 horsepower, four-cylinder gasoline engine and one that is powered by a 13 horsepower nickel metal hydride battery. It is estimated that the hybrids achieve an efficiency of 46 miles per gallon in the city and 51 miles per gallon on the highway.

Department of Military Affairs – Video conferencing stations have been placed in all DMA facilities. This helps reduce the energy costs associated with personnel commuting to meetings.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency has a continuing pollution prevention program of promoting alternative transportation that includes an annual B-BOP Day promotion; Bikeways and Bus Fare E-newsletters; participation in the Guaranteed Ride Home Program; telecommuting; special off-day parking; reserved carpool/vanpool parking; discounted bike lockers; showers; and conducting surveys and planning programs.

In the survey summary dated January 1998, the MPCA found that six percent of its employees biked to work in the summer and 25 percent carpooled on three or more days per week.

Since 1999, the MPCA has offered Metro Transit's Metropass. It is an all-you-can-ride bus pass. The idea is that with more transit use, fewer vehicles would be on the road creating less air, water, and soil pollution, congestion, parking, and urban sprawl. The program involves a low-priced all-you-can ride bus pass for MPCA employees. Currently, 63 MPCA employees at the St. Paul office are enrolled in the Metropass program.

The MPCA not only has employees using the Metropass to commute from home to work, but are also encouraged them to use it as an alternative mode between work sites. The business travel aspect of the Metropass saves the state money in parking and vehicle expenses. MPCA staff has talked to several other state agencies and businesses about the benefits of this program and how it can work for them. The MPCA is the first state government agency in Minnesota to make the Metropass available to its employees.

The MPCA still has 61 percent more people using the bus for state business than in 1998, before the Metropass. This is in spite of a 12 percent loss of staff and recent price increases. The MPCA has two electric bikes for business use. Yellow bikes are also available to staff at the DNR for lunchtime trips or any other travel purpose. The MPCA also has three hybrid-electric cars in the MPCA fleet and 64 flex-fuel vehicles, as noted above.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Due to the rural nature of our campus, this component has not been evaluated.

Central Lakes College, Brainerd and Staples – It is an ongoing policy of the college's to encourage carpooling whenever possible. Meetings are scheduled ITV whenever possible.

Dakota County Technical College (DCTC) – DCTC has a carpool and rideshare board available to staff and students. We are in ongoing negotiations with MVTA and DART to expand bus service to staff and

students. We use electronic communication on a daily basis, including online classes which offer convenience and encourage the adoption of processes that promote pollution prevention.

Inver Hills Community College – Inver Hills uses electronic means of communications whenever possible, as well as teleconferencing. We have made an intranet area available where employees are encouraged to communicate about setting up rideshare and using it.

Mesabi Range Community and Technical College – Athletic teams, recruiters, and staff are encouraged to travel to meetings, events, etc. together whenever possible, i.e. men's and women's athletic teams travel to athletic events together.

Minneapolis Community and Technical College (MCTC) – Discounted bus passes, free motorized vehicle parking, and bike racks are all ongoing and will continue in fiscal year 2006.

Minnesota State Community and Technical College, Wadena Campus – We encourage all employees to car-pool when traveling to meetings or between campuses.

Minnesota State Community and Technical College, Fergus Falls Campus – A conscious effort to reduce travel between campuses for meetings began this past year and will continue. Acquisition of poly com technology has provided an alternate meeting venue, and its use is steadily increasing.

Minnesota State University, Moorhead (MSUM) – Currently 77 percent of MSUM students are living off campus. This along with faculty and staff equals a large commuter base for the university. Two recent programs have been implemented with great success to reduce the number of single-car commuters. The Metro Area Transit bus system has arranged a partnership with MSUM to allow free transportation for students, faculty, and staff. Routes run every 10 minutes and reduce the number of commuters, especially during inclement weather. This program averages over 50,000 riders per year and is increasing in popularity and riders. For student safety reasons, MSUM Student Senate implemented a taxi ridership program for MSUM students. The Drive-a-Dragon program allows students to take a taxi (fueled by E85) anywhere in the Fargo-Moorhead metro area for $2 during the hours of 9 p.m. to 6:30 a.m. There are currently 1,176 students enrolled in this program. Also, due to the diversity of programs at MSUM, any students, faculty, or staff that attends off-campus meetings and conferences are strongly encouraged to form a carpool in order to reach their destination.

Northwest Technical College, Bemidji – Faculty, staff, and administration are encouraged to use alternative electronic communication. Due to lack of adequate staffing and budgeting, there are no reduction figures from a standard to calculate.

We do encourage the use of electronics for communication in the forms of e-mail, teleconferencing, interactive television, faxing, and hosting meetings on campus to limit vehicle usage.

Riverland Community College, Albert Lea and Austin – It is an ongoing policy of the college's to encourage carpooling whenever possible. Meetings are scheduled interactive TV whenever possible.

St. Cloud State University (SCSU) – SCSU has moved beyond subsidizing bus passes for students and faculty to joining with student government and St. Cloud MTC to provide a new Free Ride program. This includes evening transportation in the campus area. This partnering with St. Cloud Metropolitan Transit Commission provides free service on 17 bus routes to current SCSU ID cardholders. Over 30 apartment complexes are within 20 bus minutes of campus. Parking congestion is reduced. Clipper West route riders have increased 107 percent for January 2004 compared to January 2003.

St. Cloud Technical College (SCTC) – Carpooling is strongly encouraged when on college business.

Vermilion Community College (VCC) –We are beginning a fleet evaluation of our vehicles to see if we have the proper mix. Also, the Law Enforcement Training program is partnering with Hibbing Community College for vehicle training. This may result in us returning two Crown Victorias to motor pool in exchange for better mileage FFV vehicles.

Department of Natural Resources (DNR) – DNR has purchased and set up teleconferencing equipment. We have had 12 meetings with participation from 14 to 25 regional staff at each meeting. This has reduced travel by more than 15,000 miles and saved an estimated 800 gallons of fuel.

Department of Transportation (Mn/DOT) – 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 continues to promote telecommuting for employees in the Twin Cities metropolitan area.

Mn/DOT continues to promote various alternative transportation options such as high-occupancy vehicle lanes, commuter rail, bus, bicycling, walking, and light rail. Mn/DOT, city of Minneapolis, and Metro Commuter services jointly encourage and manage carpool parking. Also, Mn/DOT plans to partner with other state agencies, citizens, and local officials in pilot projects to encourage alternative transportation.

University of Minnesota – In the near future, the University of Minnesota will become host to the Zipcar, an hourly car rental service that allows subscribers to use conveniently located cars for short periods of time without all of the usual headaches and costs of owning, maintaining, and parking a car on campus. The university hopes this will alleviate some of the congestion on the streets and parking lots in the campus area as well as be a worthwhile service for students and staff.

In June 2004, the University of Minnesota was designated one of the Best Workplaces for Commuters℠ by the U.S. EPA and U.S. Department of Transportation (DOT). Best Workplaces for Commuters℠, a voluntary partnership program designed to cut traffic congestion and traffic-related air pollution, recognizes employers that provide environmentally friendly commuter benefits to employees. Offering these commuter benefits identifies the university as an organization committed to reducing pollution, commuting costs, traffic congestion, and employee stress caused by single-occupant vehicle commuting. Best Workplaces for Commuters℠ (www.bwc.gov) is a public-private partnership developed by the U.S. EPA and DOT. U.S. EPA and DOT have established a voluntary National Standard of Excellence for employer-provided commuter benefits. The program challenges employers across the country to voluntarily meet the National Standard of Excellence.

The Twin Cities campus is host to nearly 80,000 arrivals per day. The campus spans nearly five miles from east to west. 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 (1) reduce automobile traffic to the Twin Cities campus, and (2) more efficiently direct the flow of vehicle 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 signage and special lanes on university roads. The Twin Cities campus uses a mass transit system to bus students, employees, and guests from parking lots to various locations on campus. Mass transit is an environmentally friendly alternative to single-occupancy vehicles, and a bus carrying as few as seven passengers is more fuel-efficient than the average single-occupancy vehicle.

The campus bus routes and schedules have been evaluated and rearranged in an effort to more effectively serve the riders while minimizing congestion on the urban campus streets and fuel consumption and air pollution as buses sit in traffic. Since 2001, these efforts have reduced bus miles traveled by over 200,000 miles annually, which translates into conserving more than 10,000 gallons of fuel and significant reduction of environmental pollution.

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 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. Since the introduction of U-Pass program, we have realized a positive change in people's travel mode to campus. Before the introduction of this program, 43 percent of those visits were people driving to campus, while 13 percent used the bus as a means of getting to work or school here at the University of Minnesota. Since U-Pass, we estimate that there are now 32 percent driving and 24 percent arriving by bus.

Another encouraging result shows 64 percent of students who buy a U-Pass use it to travel to other destinations in the metro area. This illustrates that students are incorporating mass transit into their daily routine and establishing positive transportation patterns that will continue into their adult lives. The U-Pass 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 more than 220 tons of carbon monoxide and 4,500 tons of carbon dioxide emissions from the air annually.

The University of Minnesota-Duluth started their U-Pass program in fall 2000 in cooperation with Lake Superior College, Saint Scholastica College, and the Duluth Transit Authority (DTA). This U-Pass program provides free transit on DTA buses for students and staff. Due to a cooperative effort between UMD administration and the DTA, students, faculty and staff, can ride the DTA anytime, anywhere in the Twin Ports free of charge with a University of Minnesota-Duluth I.D. or U-Pass. The DTA has transported more than 1 million UMD students since the introduction of the U-Pass in September of 2000. The "free-ride" U-Pass contract between the DTA and UMD is in service until the 2005–2006 academic year. The more than 2,000 riders per day is outstanding usage of this program, which decreases traffic congestion, fuel consumption, air pollution, and the need for using up more open space for parking facilities.

The university administration actively promotes Twin Cities campus students living on-campus and promotes new student housing projects to entice students to live on-campus or in the campus community, rather than commuting. The university continues to support this effort knowing it 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 1,000 gallons of gasoline daily, and by eliminating more than 110 tons of carbon monoxide and 2,200 tons of carbon dioxide emissions from the air annually.

The University of Minnesota's Intelligent Transportation Systems (ITS) Institute (http://www.its.umn.edu) was created to conduct a set of federally sponsored studies on how transportation systems can be planned in an increasingly complex social, political, economic, and technological environment. The institute plans and conducts activities that further the mission of the University Transportation Center program of the United States Department of Transportation. That mission is to advance U.S. technology and expertise in the many disciplines that make up transportation through education, research, and technology transfer activities at university-based centers of excellence. The institute's activities are guided by its theme of enhancing the safety and mobility of road- and transit-based transportation through a focus on human-centered technology. To that end, the institute brings together technologists and those who study human behavior to ensure that institute-developed technologies become tools that optimize human capabilities.

How do we improve the ways that we get from here to there without spending all of our resources? Not an easy question, by any means, but there are some good answers. The Center for Transportation Studies (CTS) at the University of Minnesota supports the search for those good answers through research, education, and outreach activities (http://www.cts.umn.edu). 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. A supporting goal is that this participation reflects the diversity of the various stakeholder groups affected by transportation. The center's mission is as follows: (1) 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; and (2) be a focal point for strengthening knowledge in transportation. The center identifies critical issues in transportation, and uses multidisciplinary approaches to address them.

Center research, education, and outreach programs:

- create an environment for faculty, students, and practitioners from multiple disciplines to collaborate in transportation research and education efforts.
- provide 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 (Admin) – The Resource Recovery Office (RRO) provides on-site building assessments of recycling and waste management systems, technical assistance and training, and regularly tracks recycling progress. As a group, Twin Cities metropolitan area public entities have recycled as much as 68 percent of their discards, with 28 agencies recycling more than 80 percent. The Resource Recovery Office conducts tours of the State Recycling Center facility and of its reusable office supplies area for customers and other interested parties, including international delegations to share recycling and waste reduction successes. The Resource Recovery Office prepares "Info to Know" wall postings displayed in the Capitol Complex buildings regarding pollution prevention, office clean outs, electronics recycling, waste reduction, and recycling issues.

The Resource Recovery Office also represents the Department of Administration at Minnesota's Interagency Pollution Prevention Advisory Team meetings. Representatives from the Materials Management and Plant Management Divisions regularly attend these meetings. The Resource Recovery Office provides Department of Administration support and representation on the Pollution, Reduction, Recycling Advisory Council of the Office of Environmental Assistance. RRO also partners with Sentencing-to-Service Programs in providing offenders with recycling-based work and training. 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 September Office Supply Connection Product Show and the Accounting and Procurement Spring Fling.

The Resource Recovery 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 those sponsored by the Recycling Association of Minnesota, Solid Waste Association of North America, the Minnesota Pollution Control Agency, and the Office of Environmental Assistance. The Resource Recovery Office's website, www.rro.state.mn.us, is regularly updated to provide information in lieu of mailing or faxing. The Plant Management Division coordinates departmental pollution prevention information. RRO provides educational/work opportunities to St. Paul school students in their "Transition to Independence" school year and summer school programs.

During FY 2005, the Materials Management Division, as a part of its Authority for Local Purchasing Training, ALP Management Overview, and other training programs, has trained more than 264 state agency staff in pollution prevention and procurement of environmentally responsible goods and services. The Materials Management Division worked with the Office of Environmental Assistance to provide additional environmentally responsible information through the purchasing training provided to state employees. In addition, the Materials Management Division continues to provide all updates of the ALP training manual that is provided to state employees. All updates are now distributed on the MMD website to eliminate the need to send out paper updates. The entire manual is on the MMD website, and greatly reduces the need to print hard copy versions.

The Materials Management Division partners with OEA to identify areas where current or new contracts can be expanded with more environmentally preferable goods or services. MMD's Acquisition Management Specialists incorporate environmental considerations into solicitations whenever possible. They accomplish this in a variety of ways, such as solicitation requirements, environmental preferences, or environmental evaluation criteria. The Materials Management Division maintains a list of state contracts that contain environmentally preferable products and services. The list is available on the MMD website at www.mmd.admin.state.mn.us/envir.htm.

The Materials Management Division has established an advisory committee called the Environmentally Responsible Work Group, which meets to foster awareness and buy-in, share knowledge, and set priorities for environmentally preferable purchases. This group works to promote environmental purchasing in state government and includes representatives from state government as well as interested nonprofit organizations. The current members:

- Resource Recovery Office
- Office of Environmental Assistance
- Minnesota Pollution Control Agency

- Department of Transportation
- Department of Natural Resources
- Housing Finance Agency
- Department of Labor and Industry
- Department of Economic Security
- Veterans Home Board
- Recycling Association of Minnesota
- Sierra Club

Previous education efforts in the area of recycled paper purchasing have been very successful. State agencies continue to purchase over 90 percent recycled-content paper.

The Materials Management Division and Resource Recovery Office contributed to the development of the *Environmental Preferable Purchasing Guide: How to get the stuff you need and still be good to the environment*. The EPPG is a user-friendly resource to make green purchasing easy. It includes data on product options, sample specifications, existing Minnesota contracts, etc. The guides were distributed to all certified purchasers as well as to cities and counties. The Resource Recovery Office and the Materials Management Division promoted this guide through displays and during presentations. The guide is featured at all ALP training sessions. MMD has a link on its website to the OEA website from which personnel may print a copy of the guide for their personal use.

The Materials Management Division maintains a section on its website dedicated to environmental purchasing. Featured in this section are

- environmentally preferable goods and services lists
- Minnesota legislative requirements
- Administration's Biennial Report on MMD Purchasing
- environmental news about new products and contracts
- product experience/case studies on environmentally preferable products
- links to other websites helpful in environmental purchasing

The Materials Management Division implemented a change in MAPS that requires entry of an environmental code on the order lines for goods and services. This code is shown on state contracts so that buyers know what types of products are more environmentally responsible when making purchasing decisions. This code also allows better tracking of the environmentally preferable purchases.

Bemidji State University (BSU) – 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.

In conjunction with Earth Day, the Environmental Advisory Committee began issuing brief tips to faculty and staff about ways to reduce waste, both at work and at home. The messages are posted to the faculty/staff e-mail list. They were originally planned as an Earth day promotion but have been continued with a new tip being posted each month.

BSU Environmental Studies major, Tessa Haagenson, was selected as a 2005 National Wildlife Federation Campus Ecology Fellow. She was awarded a $1,000 fellowship to support her project to educate students and the community about global warming and related issues and to explore a student fee to support wind energy development at BSU.

BSU has established an endowment fund through the BSU Foundation that allows individuals and/or groups donating money to BSU to designate it for support of environmentally sustainable programs. The fund is used for student scholarships and project support directly related to environmental sustainability at Bemidji State University.

Department of Commerce – Employee and news information is distributed via a paperless process on the department's internal website.

Department of Corrections

MCF-Faribault –Staff, including safety officers and plant operations management, receive periodic pollution prevention education through annual continued education.

MCF-Moose Lake/Willow River – Moose Lake/Willow River has conducted training in the area of hazardous waste for identified staff.

MCF-Rush City – Maintenance staff are trained on chemical use. A recycling program has been established for all staff. Video conferencing is widely used for staff training and offender education, reducing the need for commuting. Our new CAFM system, Archibus, is a paperless way to request a work order and also preventive maintenance program. We have all our phone directories and many forms online to also save on paper. Online training is utilized whenever possible.

Department of Employee Relation (DOER) – DOER expects to initiate an employee education process in FY 2006 that will identify ways that employees can reduce pollution.

Office of Environmental Assistance – OEA continues to use voluntary partnerships as a means to prevent waste. Ongoing efforts with the Minnesota Chamber of Commerce Waste Wise program to help businesses recycle and reduce waste is an example.

The OEA's Sustainable Communities team has been working since 1996 to promote sustainability activities at the community level. One important component of sustainability is pollution prevention. The focus of the Sustainable Communities team's activities is the Minnesota Sustainable Communities Network (MnSCN), which has more than 2,700 members. The goal of MnSCN is to encourage networking, information exchange, and better access on the topic of sustainability.

MnSCN's major activities currently consist of a bi-weekly sustainability e-mail newsletter and the NextStep sustainability website. MnSCN's popular bi-weekly newsletter typically contains most of the following sections: tools and resources, jobs available, events, sources of funding, and news from members. Over 215 issues of the newsletter have been published.

NextStep (www.nextstep.state.mn.us) is an interactive web-based assistance tool that provides a convenient point of access to information about sustainability, with a Minnesota focus. It allows for entry of information by any site user. Site features include descriptions of over 1,000 resources, dozens of case studies, a searchable online member directory, job listings, an event calendar, an archive of past e-newsletter issues, and more. NextStep is divided into 12 major topic categories related to sustainability, each with its own volunteer "topic guide" and with a list of selected top resources. Other websites the OEA manages are www.reduce.org and www.seek.state.mn.us, both of which have information relevant to pollution prevention.

The OEA developed a pilot project to test interest and effectiveness of a marketing campaign related to green pricing. At the Living Green Expo, visitors were encouraged to buy green power through their electric utility. At the event, 280 people pledged to buy green power, and data from purchases at the event documented the prevention of 386,000 pounds of CO_2, 1,162 pounds of SO_2, 836 pounds of nitrogen oxides, and 4 grams of mercury. Based on the success of the pilot, OEA is extending the Buy Green Power campaign statewide through media outreach, staff challenges, and community events.

The OEA distributes the following materials through its Education Clearinghouse:

- Source Reduction Now, a detailed guide to implementing source reduction programs in companies and agencies
- "Retail Hardware-Best Practices for Waste Management" guidebook and video
- "Transport Packing: Cost-effective Strategies to Reduce, Reuse and Recycle in the Grocery Industry"
- "Mercury and the Health Professional" video for mercury reduction in the healthcare industry

- Junk Mail Campaign materials
- Waste Reduction Campaign materials
  - Reducing Toxicity in Your Home
  - Creating Less Trash at School
  - Composting Organic Waste
  - How to Grow a Healthy No-waste Lawn and Garden
  - Reduce the Need for Pesticides and Herbicides
  - Reducing Trash When You Shop
  - Reducing Waste at Home
  - Reducing Waste in the Workplace
  - Reducing Waste When Traveling
  - Using Phosphorus-free Lawn Fertilizer
- Minnesota GreenPrint
- Minnesota Report Card on Environmental Literacy
- Environmental Literacy Scope and Sequence
- Getting the lead out – a fact sheet for sport fishermen
- Household Hazardous Waste: Pharmaceutical Waste
- Household Hazardous Waste: Safe Disposal Options for Needles and Syringes fact sheet
- Global Warming and Climate Change in Minnesota
- Buy Green Power fact sheet
- Buying Green Products checklist
- Buying recycled content paper
- Green Cleaners fact sheet
- Nontoxic Cleaning Recipes
- Toxicity Reduction and Backyard Burning Resources

Design for the environment: The design stage of product development is an unparalleled window of opportunity for championing the environment. This is the time when the materials and energy used to manufacture a product are determined. Once these decisions are made, the environmental impacts of the product for its entire lifecycle are largely set. A number of Minnesota companies, IBM (Rochester), Medtronic, Tennant Company, BAE Systems, and 3M, recognize the significance of this stage of manufacture and have integrated design for the environment (DfE) into their product design processes. Continued support of this emerging trend, is occurring through the recent development of additional DfE resources including a "Better by Design" video and implementation guide book. These resources complement pollution prevention grants, such as those awarded by OEA to the General Mills-Chanhassen facility and Perfusion Systems, a Medtronic cardiac business. The pollution prevention grants helped these businesses implement and integrate DfE into their product design processes.

OEA staff continue to work with MnTAP, representatives from the Minnesota healthcare community, and state and county environmental staff to promote pollution prevention within the healthcare sector. The Healthcare Environmental Awareness and Resource Reduction Team (HEARRT) meets quarterly, with presentations covering mercury reduction, water and energy conservation, national programs such as the Hospitals for a Healthy Environment (H2E) program and the Joint Commission on Accreditation of Healthcare Organizations, and local sustainability efforts in healthcare facilities.

OEA staff coordinate the Interagency Pollution Prevention Advisory Team (IPPAT), developing agendas and facilitating quarterly meetings, recording minutes, and maintaining the mailing list. IPPAT continues to implement the executive order for pollution prevention, including pollution prevention, waste reduction, and

energy and resource conservation. Agencies that regulate activities that 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. The IPPAT meets quarterly to share successes and learn about pollution prevention initiatives others are taking.

IPPAT has been designated as the entity to coordinate implementation of the August 2004 executive order on reducing air pollution. The first requirement of the order was to pick at least two actions from a list of eight to prevent air pollution. That list of actions is:

a. Purchase or lease the most fuel-efficient and least polluting vehicles that meet the operational needs of the state department.

b. Refuel state-operated vehicles with the cleanest fuel available.

c. Encourage employees to consider alternatives to single-occupancy vehicle commuting.

d. Reduce state energy use through purchasing energy-efficient office equipment and appliances.

e. Employ energy-conserving strategies in state-owned or leased buildings.

f. Procure and use products with the lowest potential to contribute to air pollution, such as cleaning products with low amounts of volatile organic compounds.

g. Employ landscaping that reduces the need for gasoline-powered maintenance equipment.

h. Purchase electricity generated from renewable sources.

The IPPAT developed a system of metrics to track the effectiveness of agencies' actions and placed it on the Internet for all the agencies to use when developing the 2005 IPPAT Pollution Prevention Summary Report. The Minnesota Government Reaching Environmental Achievements Together (MnGREAT!) Awards recognize environmental achievements by government employees in the areas of pollution prevention, toxicity reduction, waste reduction, energy conservation, water conservation, recycling, and composting. IPPAT, which sponsors the program, recognizes projects that demonstrate a high degree of commitment and leadership and provide substantial benefit to the environment.

This year there were a few changes made to the MnGREAT! program. The distinction between the two programs was made very clear. MnGREAT is for the government sector and the Governor's Awards are for the private institutions, nonprofits, and business sectors. The two programs still have separate judging panels and criteria, but both programs are part of the Governor's Awards. MnGREAT is now called the Governor's MnGREAT Awards. These changes will be reviewed by the IPPAT committee and re-evaluated for the 2007 awards program. The ceremony will be held in conjunction with the Governor's Pollution Prevention Awards at the Minnesota Pollution Control Agency's Air, Water, and Waste Environmental Conference on February 15, 2006.

Metropolitan Airports Commission (MAC) – MAC employees are trained annually on spill prevention, control and countermeasures and storm water pollution prevention 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. There is also annual hazardous material training where basic pollution prevention methods are addressed.

Metropolitan Council Environmental Services (MCES) – MCES employees volunteer to staff displays and interactive exhibits at events such as the Earth Fest, Earth Day at the Minnesota Zoo, the Living Green Expo, the State Fair, the Children's Water Festival, Tooling for Teaching Watershed Education, and Farmington Pollution Prevention Days. Exhibits are also available to be loaned out, and educational materials are available for distribution.

The IWPPS works in an advisory, or 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 2004. A specific pollution prevention website has been prepared for industries, customers, and other external users on the council's Internet site: www.metrocouncil.org/environment/PollutionPrevention.

Metropolitan Mosquito Control District – Annually, the district conducts pesticide applicator training sessions for all district employees in conjunction with the Minnesota Department of Agriculture. A portion of these training sessions is used to review source reduction, 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 the district. 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.

Department of Military Affairs – The MNARNG has developed a variety of hazardous waste, solid waste, recycling, and spill prevention and cleanup training formats. DMA personnel are provided with literature, CD-ROMs, video cassettes, as well as online training. All of these methods of training are essential due to the high deployment of soldiers as well as the widespread locations of MNARNG facilities.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency has pollution prevention information available to all staff and external customers on its websites. This information is easy to access and includes many suggestions and training tools for the staff to minimize waste at work and at home on a daily basis.

In performance measurement and program evaluation, project managers learn and apply systematic and holistic project design and procedures for identifying performance objective and denying performance measures to ensure prevention tracking. Funding is through a pollution prevention grant pass-through. Staff are the pollution prevention grant manager and the 319 Clean Water Program grant managers, other regulatory project managers, information system specialists, communication specialists, and quality systems specialists, and the Environment and Management Assistance staff, working with grant partners. Quantifiable data are not yet available.

The National Pollution Prevention Roundtable conference provided an opportunity to take away ideas for replicating prevention initiatives successful in other states and to grow and maintain professional networks. Attending were two MPCA personnel, and partners.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – ATC finds audio and video conferencing, online employee educational products, facsimile transmissions and electronic transfer of reports and data to be energy- and time-efficient processes that reduce our consumption of energy and consumable products. ATC recently received approval to provide online degrees, which also reduces energy and consumable product consumption by allowing the students to receive and submit educational products electronically.

Central Lakes College, Brainerd and Staples – Annually the staff and faculty of Central Lakes College are trained in Right-to-Know, Blood Borne-Pathogens, crisis management, etc. Programs and departments that need additional training (such as hazardous chemicals and wastes, lock out-tag out, confined spaces, ladders and lifts, etc.) are trained annually as needed.

Dakota County Technical College (DCTC) – Identified college employees are sent for hazardous waste training annually. Administrative personnel attend and participate in local council and committee meetings

to address the community needs for environmental conservation.

Minnesota State University, Moorhead (MSUM) – The Department. of Environmental Health and Safety continues to educate the university community regarding hazardous waste management, pollution control measures, storm water runoff, spill prevention, and other requirements throughout the year. Due to the diverse community and resources on our campus, MSUM offers many classes with respect to environmental education. These classes follow strict curricula of current and past issues, events, and a complete understanding of environmental processes. Recently students have taken initiative to form groups of their own that help raise awareness within the community as well. Some of those groups include the Sustainable Campus Committee, MSUM Environmental Action Network, Support International, GEO, Tri-Beta, and Volunteer Visions. These groups help educate the community by becoming involved in yearly events such as Earth Week Speakers, campus cleanup day, and many more.

Pine Technical College, Pine City – To extend its pollution prevention efforts to those we serve, PTC has adopted electronic communications to replace its traditional student mail system and its internal communications system for faculty and staff. The college accomplished this by moving to a totally electronic means of communications with student and staff, thereby reducing paper waste.

Riverland Community College, Albert Lea and Austin – Annually the staff and faculty of Riverland are trained in Right-to-Know, Blood-Borne Pathogens, crisis management, etc. Programs and departments that need additional training (such as hazardous chemicals and wastes, lock out-tag out, confined spaces, ladders and lifts, etc.) are trained annually as needed.

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 hazardous waste controls. An online degree in aviation maintenance management is now available. A Master of Science program in Environmental and Technical Studies, begun six years ago and serving a wide variety of backgrounds, finds about a third of program students are licensed teachers returning to school. Other research interests include recycling, landfills, and public perceptions of fuel cell technology. The charter class of 20 nursing students received their baccalaureate degrees May 9, 2004.

St. Cloud Technical College (SCTC) – Training is being provided to staff on proper handling of hazardous materials. A new Hazardous Waste program was instituted and the appropriate staff was trained on its contents.

North Hennepin Community College (NHCC) – Brightly colored signs and containers are prevalent in buildings and on grounds throughout campus. Plant Services staff are aware of the importance of the college's recycling effort, and new hires are trained on proper procedure before being allowed to work independently.

Department of Transportation (Mn/DOT) – Mn/DOT continually conducts training within the department and occasionally to counties, cities, and the private sector.

University of Minnesota – Education of the current and future generations on the importance of pollution prevention, resource conservation, and sustainability is one of the most important thrusts in developing a sustainable world. The University of Minnesota offers over 500 environmental courses from 54 different departments, many of which deal directly with pollution prevention. The University of Minnesota has one of the largest environmental biology research programs in the world. At last count, it included 19 academic departments and 23 centers, whose work could be classified as sustainable. Programs are as diverse as the Minnesota Landscape Arboretum to the Minnesota Sea Grant to the Raptor Rehabilitation Center to the graduate program in microbiology, immunology, and cancer biology. The efforts of this research, teaching, and outreach not only reach every corner of the state, but also include world-class research with potential global implications. The University of Minnesota has baseline data on fields and forests that cover more than 100 years. This data will be invaluable as new plants are developed and diseases fought. Much of the university's efforts involve developing methods to maximize the state resources without depleting them.

The University of Minnesota established the Precision Agriculture Center in 1995 (http://precision.agri.umn.edu/index.htm) to foster the use of site-specific management techniques through collaborative research, education, and outreach programs. The center's greatest contribution will be its legacy of practitioners, researchers, and educators. In development is an undergraduate minor in precision agriculture and a graduate program. Both efforts will emphasize multidisciplinary instruction in spatial and temporal variability, management, engineering, and environment protection. Research projects and internships with farmers and agribusiness will give students the practical experience and relationships they need for future success. The center conducts research on a variety of issues through multi-disciplinary on-farm studies conducted in many states and around the world. Graduate students use and develop innovative techniques to study spatial and temporal variability in crop yield and quality, soil and landscape attributes, and precision crop management practices. The outreach program partners with industry, farmers, and academics to develop content for training modules. Present areas of emphasis include yield map interpretation, intensive soil sampling methods, on-farm experiment design, and precision farming profitability studies. The center also hosts the International Conference on Precision Agriculture, in cooperation with the Minnesota Extension Service. The biennial conference attracts more than 650 academics and industry representatives from 20 countries who share findings and preview technology.

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, Ralph Rapson Hall. 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. On the roof of Ralph Rapson Hall, three 24-panel arrays of photovoltaic solar panels provide electricity to the building. The 15 kW system was formerly on the Science Museum in St. Paul and was moved and reinstalled at the university by Xcel Energy. A new project is underway in which the energy from the PV collectors will be used to power an electrolyzer that separates water into hydrogen and oxygen. The hydrogen is used to power a fuel cell that generates electricity. One advantage of such a system is that by converting solar energy to hydrogen, it can be stored and used when needed. The generation of electricity in this manner produces no carbon emissions or air pollutants. Xcel Energy and the Office of Environmental Assistance jointly sponsor this project. 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 this goal.

The Minnesota Sustainable Design Guide, developed by the Center for Sustainable Building Research (http://www.csbr.umn.edu), educates and assists architects, building owners, occupants, educators, students, and the general public about sustainable building design. This design tool can be used to overlay environmental issues on the design, construction, and operation of both new and renovated facilities. It can set sustainable design priorities and goals; develop appropriate sustainable design strategies for a particular project; and determine performance measures to guide the design and decision-making process. It can also organize and structure environmental concerns during design, construction, and operations phases. The goals of the Minnesota Sustainable Design Guide are to: (1) educate designers, building owners, operations staff, and occupants about the concepts, goals, and significance of sustainable design; (2) develop an orderly decision-making process with measurable outcomes along with a database of decisions and outcomes; (3) provide flexibility in the way priorities are set and outcomes are measured within the system, so it can be adapted for different clients or agencies, regions, and building types; (4) organize information in a hierarchy that permits users to easily understand the sustainable design process; (5) create a system that can easily grow and change as more experience and new information becomes available.

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

The Waste Abatement Committee, made up of members from many key departments, coordinates and monitors 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 pollution prevention /resource conservation web page that will promote and provide instruction and information about self-audits and other pollution prevention /resource conservation techniques.

The Minnesota Technical Assistance Program (MnTAP) is a grant program at the University of Minnesota, School of Public Health, funded by the Office of Environmental Assistance. MnTAP helps Minnesota businesses protect the environment and stay competitive by providing practical alternatives to prevent pollution of our land, air, and water. By reducing waste and increasing efficiency, you can save on disposal and raw material costs, decrease regulatory compliance burden, and make working conditions healthier and safer for your employees (http://www.mntap.umn.edu). MnTAP provides technical assistance to Minnesota businesses through telephone assistance, site visits, intern programs, presentations and workshops, technical publications, library, and materials exchange.

The University of Minnesota's Sustainable Forests Education Cooperative (http://www.cnr.umn.edu/CCE) has since 1997 alerted natural resource professionals to continuing education opportunities in a broad range of fields—forest ecology and management, wildlife biology, forest hydrology, botany, best management practices, technology transfer, human dimensions, and others. The cooperative, originally named the Institute for Sustainable Natural Resources, grew out of the Sustainable Forest Resources Act of 1995 and 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, 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 of Minnesota's College of Natural Resources provided the matching funds to create the Institute. The cooperative provides continuing education opportunities: skill building and special topics 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 cooperative 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 cooperative will bring current research, new technologies, and state-of-the-art practices to natural resource professionals.

The University of Minnesota Extension Service (http://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, residential systems, forestry/wood products, and on all aspects of environment and natural resource management, from water quality, forestry and wood products, solid waste and wastewater management, to indoor environmental issues such as air quality, radon, housing materials, and systems.

The Institute for Social, Economic and Ecological Sustainability (ISEES) (http://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. Our 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. We believe 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 our seminars, workshops, and annual publication competition, we bridge 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 include: (1) generate a new transdisciplinary synthesis of concepts and methods for research on sustainability issues; (2) understand forces influencing sustainability at local, regional, and global scales; (3) develop and evaluate techniques for assessing conditions for sustainability; (4) generate policy options for moving communities toward sustainable conditions; and (5) facilitate information exchange among scholars, practitioners, and citizens.

12. Electronics

Department of Administration (Admin) – The Materials Management Division (MMD) presented at the electronics compliance session of the 2004 MPCA Air, Water and Waste Conference, speaking about its computer/electronics recycling contract. The video, *Exporting Harm*, which is about the trashing of portions of the Far East in the name of recycling electronics, was shown at the conference. More than 50 people attended the presentation. After the conference, MMD received about a dozen e-mails asking for information. MMD had previously spoken on this subject at the October ITS meeting and the October IPPAT meeting.

MMD electronic equipment contracts provide Energy Star-compliant computers, copiers, fax machines, monitors, and printers. In the new electronic equipment contracts, MMD requires that all energy-efficient equipment be identified.

The Materials Management Division promotes the reuse of computers and other electronics through its Surplus Services program. Computers are provided to Minnesota K-12 schools in collaboration with the Department of Corrections. The program accepts personal computers no longer needed by state agencies and private businesses. Through the use of prison inmate labor, the computers are refurbished and distributed throughout K-12 schools. Surplus computers are also distributed to township government offices. The Materials Management Division extended the contracts for leasing computer equipment. This will reduce the amount of surplus and used equipment that requires hazardous waste management.

The Materials Management Division, working with other states that are members of the Western States Contracting Alliance, developed a Request for Proposal for computer hardware. The RFP took into consideration several environmental issues.

- Take back and recycling programs.
- Compliance with environmental improvement programs for reduction/minimization/avoidance of the use of toxic and hazardous constituents.
- Compliance with international directives such as the European Union's directive, Restriction of Hazardous Substances.
- Certification by independent third-party eco-labeling programs such as TCO and Blue Angel.
- The migration to the use of recyclable, nontoxic packaging.
- Compliance with energy-efficiency programs such as Energy Star.

The Materials Management Division, in conjunction with other agencies and Cooperative Purchasing Venture members, maintains a statewide computer/electronics recycling disposal contract with Asset Recovery Corporation of St. Paul. The contract is *Hazardous Materials: Computers/Electronics: Recycling and Waste Management*, contract release number H-90 (5), contract number 426359. This contract is available to all state agencies and CPV members. Materials can be dropped off at Asset Recovery, or Asset Recovery can pick up the materials from customers. Asset Recovery can also assist with special event collections, etc. In the second year of the contract, approximately $800,000 was paid to Asset Recovery to recycle computer/electronic waste. MMD, 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 refurbished equipment.

Department of Commerce – Computer equipment is either surplused or disposed of according to state guidelines.

Department of Corrections

MCF-Rush City – Rush City utilizes electronic toilets, showers, and sinks where applicable for dual purpose of saving energy through regulation of water and reduction in inmate vandalism. We are using the state contract vendor for picking up junk electronic boards and parts.

MCF-Moose Lake/Willow River – All waste electronics have been and were handled as hazardous waste and shipped with the state contract vendor. There were 2½ tons of waste electronics shipped during the year.

Department of Employee Relation (DOER) – DOER will continue to purchase/lease Energy Star-compliant office equipment in FY 2006.

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 environmentally preferable purchasing for electronic equipment, market development, and end-of-life management strategies for electronic appliances.

Minnesota was one of ten states that participated in the National Electronics Product Stewardship Initiative (NEPSI). Other stakeholders included 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 NEPSI was to reach an agreement on a national program for managing certain electronic products at end of life. NEPSI was unable to conclude an agreement in 2004 and consequently no federal legislation was agreed upon. The Minnesota Legislature is now examining options for state programs.

In 2003, the Minnesota Legislature enacted a disposal ban for cathode ray tubes that will be implemented in July 2006. The OEA will continue to work with local governments, manufacturers, retailers, and others to offer collection events and develop the necessary processing infrastructure in Minnesota.

In 2001, the OEA received a grant from the U.S. EPA Region 5 to aid in the development of an infrastructure in the upper Midwest to recycle flame-retardant plastics from electronics, specifically television housings. Flame retardants in TVs, decabromodiphenyl ethers, are currently under testing in Europe to determine their effect on humans and the environment. California has banned the penta-PBDEs and octa-PBDEs. An important lesson learned from the grant project is that recycling programs for certain types of plastics from electronics will likely be established in the future. These programs have the potential to decrease the production of new flame retardants by the reuse of these chemicals through the recycling process.

The OEA is participating in the development of the Electronic Product Environmental Assessment Tool (EPEAT) to promote the purchasing of environmentally preferable IT equipment by public entities and other large institutions. The project is sponsored by the U.S. EPA and involves manufacturers, recyclers, federal and state government representatives, and non-government organizations. EPEAT is a tool for evaluating the environmental performance of electronic products throughout their life cycle, and it addresses many environmental issues associated with the design, use, and end-of-life management of IT products. The tool will be available for use in 2006, and the OEA is working with state and local government on adopting it in Minnesota.

The state of Minnesota contract ensures proper management of used electronics discarded by government agencies and public entities. The contract includes a provision specifying that no component materials from used electronics are exported overseas for management.

Iron Range Resources and Rehabilitation Agency (IRRR) – The Information Technology Department recycles outdated computer equipment. In 2005, 2,000 pounds of computer equipment was transported to the Asset Recovery Corporation in St. Paul. Information Systems also recycles used printer toner cartridges and purchases recycled printer toner cartridges when available.

Metropolitan Airports Commission (MAC) – MAC purchases computer equipment that is Energy Star-compliant with features such as sleep mode that reduces energy consumption for computer monitors. High-

efficiency ratings are specified for purchases of electronic equipment and appliances. Obsolete electronic equipment is recycled by an approved vendor. Lack of specific data prevents quantifying the reduction of VOC, NOx, and PM emissions resulting from increasing the use of energy-efficient appliances and electronic equipment.

Metropolitan Council Environmental Services (MCES) – The MCES sends used office electronics—computers, cathode ray tubes, disc drives, printers, etc.—to a vendor, Smith Microtech, for evaluation. Smith salvages what it can for resale. Unsalvageable units are dismantled, and the components are recycled. In 2004, 605 units were recycled.

Minnesota Pollution Control Agency – As noted above in the paragraph about the emissions calculator, there is no information available about the energy use of Minnesota Pollution Control Agency electronic equipment removed from service. The only information which exists is about the weight. In 2003 and 2004, the MPCA donated or recycled the following electronic equipment (weights in parentheses):

2003		2004	
55 laptops	440 lbs	34 laptops	272 lbs
588 computers	26,460 lbs	212 computers	9,450 lbs
121 monitors	4,235 lbs	114 monitors	3,990 lbs
15 printers	600 lbs	13 printers	520 lbs
7 printers	784 lbs	5 printers	560 lbs
2 scanners	100 lbs	none	none
4 modems	12 lbs	none	none
none	none	1 docking station	5 lbs
none	none	4 UPS	40 lbs
none	none	2 disk drives	2 lbs
none	none	1 power supply	30 lbs
none	none	1 switch	15 lbs

This represents a total of 32,255 pounds of electronics that were reused or recycled in an environmentally acceptable manner.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – ATC purchases equipment that is Energy Star-compliant. Obsolete electronics no longer in use at our facilities are either offered for purchase, donated to a nonprofit organization, or recycled through an approved, licensed electronics recycling vendor according Minn. Stat. § 16C.23, subd. 6 specifications.

Dakota County Technical College (DCTC) – All used electronic equipment is recycled through the MnSCU system and then asset recovery programs. DCTC is committed to reducing energy consumption through purchasing energy-efficient office equipment and appliances. Three hundred monitors have been replaced with energy-efficient models. All new appliances and copy machines are equipped with energy-efficient modes.

Minnesota State University, Moorhead (MSUM) – Reuse of PCs on the MSUM campus is very much encouraged. There is a strong program towards department trading of PCs and donation to student organizations and nonprofit organizations. This program reduces the number of required new PCs and extends the service life of older machines. Also, most of the electronics on the MSUM campus have been updated to meet Energy Star requirements that helps reduce campus-wide consumption of resources. All unwanted electronics are recycled through the Department of Environmental Health and Safety, that in turn works with recycling vendors from the state contract list.

Northland Community and Technical College – During fiscal year 2005, we expanded our recycling program on all campuses.

Northwest Technical College, Bemidji – We have an understanding in our Information Technologies (IT) Department that all equipment that is purchased is the most energy efficient available and Energy Star-rated.

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. E-mail announcements also help relocate electronic equipment from surplus to reuse in another department. Other electronic equipment (shipments totaling about 49,950 pounds and net cost of about $14,620) were recycled for somewhat offsetting commodity and precious metal credits. Styrofoam from computer, electronic, and other shipping cartons was also recycled.

St. Cloud Technical College (SCTC) – All electronics (circuit boards, computer monitors, computers, etc.) are properly disposed of through licensed contractors.

Department of Natural Resources (DNR) – Computers and monitors all use energy-conservation mode.

North Hennepin Community College (NHCC) – 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.

Department of Revenue (DOR) – Revenue has restricted the use of coffee makers and eliminated the use of coffee warmers and auxiliary heaters. This not only reduces fire hazards, but it also avoids problems with dozens of electrical appliances operating, many non-productively, throughout the day. Our older CRT computer monitors are being replaced with Energy Star LCD displays, which consume half the energy and provide less glare. Our new LCD monitors draw 38 watts versus 85 watts for the older ones that are being phased out. (700 monitors operating 8 hours per day, 250 days per year equals 65,800 kW per year). Also, fewer watts used produces less heat, which lowers the demand for cooling.

Department of Transportation (Mn/DOT) – Mn/DOT has been continually expanding its use of light-emitting-diode (LED) traffic signal heads. These devices use about 10 percent of the electric power as compared to incandescent lamps. Mn/DOT has been using red LEDs for some time, but we have also expanded the use of LEDs for the red and green indications. 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 is used primarily to monitor winter road conditions to aid in more efficient use of chemicals and equipment.

The highways traffic management system was evaluated extensively in the 1970s and 1980s. Several programs were implemented as a result of 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 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 unwanted 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 400,000 pounds of electronic material annually. The university has worked extensively with the Department of Administration and other agencies to develop a statewide computer/electronics recycling contract.

The University Computer Services (UCS, http://www1.umn.edu/ucs/pickup.htm) 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 (UCS for a charge and CRF for free).

CRF also manages a web-based exchange program (http://www1.umn.edu/reuse), referred to as the Virtual Warehouse, which 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.

It typically 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 these electronics protects the university from future environmental liability, provides resource conservation, and avoids heavy metal contamination of soil, surface waters, and groundwater.

13. Energy – Lighting

Department of Administration (Admin) – The State Architect Office specifies automatic turn-off switches for all overhead lighting in its remodeled offices. The Plant Management Division (PMD) recycles incandescent bulbs to prevent solid waste disposal. PMD coordinates building lighting retrofits with the State Architect Office and Xcel Energy to reduce energy consumption, thereby decreasing pollution levels.

The Materials Management Division procures only reduced or non-mercury fluorescent lamps. Mercury content in fluorescent lamps has been either eliminated or reduced to negligible levels as required by U.S. EPA mandates in the late 1980s and early 1990s and Minn. Stat. § 115A.965, subd. 2.

In conjunction with the Minnesota Pollution Control Agency, the Department of Transportation, and the University of Minnesota, the Materials Management Division has developed a statewide contract to recycle fluorescent lamps and HID (high-intensity discharge) lamps and light ballasts that contain PCBs (polychlorinated biphenyls). The Materials Management Division purchased solar-powered highway warning signs for the Department of Transportation. Sign of this type were subsequently added to a state contract. The Travel Management Division minimizes lighting through the use of energy-efficient lights.

Bemidji State University (BSU) – BSU continued an ongoing program of replacing T-12 fluorescent and incandescent lights and ballasts with T-8 and compact fluorescent lighting. During FY 2005, the replacements resulted in a net reduction of approximately 5,970 watts of lighting. This will reduce electrical energy consumption by about 31,000 kWh. BSU also received a rebate of $1,194 for the project through Otter Tail Power Company's participation in the Minnesota Conservation Improvement program (CIP).

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
9.096	57,084.639	0.001	126.908	11.517	8.848	229.198	1.180

BSU continued an ongoing process of installing motion detectors in campus bathrooms and rooms with intermittent use. The sensors automatically turn on lights when the room is entered and turn them off after a period of inactivity. The devices limit the energy used for lighting in areas that are used frequently, but for short periods of time. Sensors will continue to be installed on an ongoing basis as funding and time permits.

It should be noted that total energy use is influenced by a number of variables, such as occupancy loads, temperature, humidity, and hours of operation. Therefore, observed changes in energy consumption cannot be attributed solely to any one activity such as reducing lighting wattage. Normalization for these variables is necessary for accurate analysis of energy use. The values in this report have not been normalized.

Department of Corrections

MCF-Rush City – Uses electronic ballasts and has programmed lighting on a timer for automatic shut off.

MCF- Shakopee – The facility is changing from T-12 fluorescent ballasts (metal with oil) to T-8 electronic ballasts which produce less heat and less wattage, and are more efficient.

MCF-Red Wing – Used lamps (fluorescent/high-intensity discharge) are continuously collected. Goodhue County Recycling Center accepts bulbs for a fee.

Department of Employment and Economic Development (DEED) – Efficient light fixtures were installed in our leased space within the First National Bank Building.

Office of Environmental Assistance (OEA) – The OEA encourages energy conservation via its grants. MnTAP's energy-efficiency efforts have been effectively integrated with pollution prevention activities in 2005. MnTAP has formed partnerships with various organizations that will help provide resources to offer energy-efficiency assistance. The Minnesota Department of Commerce has supported MnTAP's efforts in DOE Best Practices training courses and the Industries of the Future program. MnTAP's relationship with the Retired Engineers Technical Assistance Program (RETAP) has resulted in some joint site visits in which RETAP covers energy efficiency. One MnTAP intern identified a potential reduction of 86,547 therms and $71,651 in savings to the company. Partnering and training has helped build MnTAP's expertise in energy-efficiency assistance for site visits and intern projects. MnTAP included energy-efficiency opportunities in its site visits for seven companies in 2005.

Occupancy sensors have been installed in all the offices and conference rooms in the building shared by the OEA and the MPCA.

Iron Range Resources and Rehabilitation Agency (IRRR) – In 2005, the Eveleth Administration building upgraded their lighting system by replacing the fluorescent lights with metal halide lights in the shop and storage building. Also, motion sensor lights were installed in restrooms and in the commons area, and four new insulated energy-efficient overhead doors were installed at the Eveleth shop. The fluorescent tubes are collected and recycled at Mercury Waste Solutions in Roseville. The ballast is shipped to the Clean Shop Program in Duluth.

Metropolitan Council Environmental Services (MCES) – 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 2004, 4,312 lamps were recycled through Retrofit Recycling in Little Canada, a reduction of almost 130 percent over 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.

Metropolitan Council Metro Transit – Several retrofits of lighting systems have been accomplished at two of the facilities. Installation of energy-efficient fluorescent lamps and high-intensity vapor lamps has been done. These retrofits also included replacing the lamp ballast with high-efficiency electronic systems.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's 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. In 2004, all closed offices, restrooms, and conference rooms in the St. Paul building were equipped with motion-detecting light switches.

The MPCA 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 day lighting. The floor plan is specifically designed to allow the maximum amount of light to enter the workspaces. The MPCA installed a revolutionary new day lighting feature, tubular skylights in the Brainerd Office administrative area, to test and measure performance and energy savings. The Brainerd Office also installed motion-detecting light switches in many office areas to help reduce the amount of electricity used.

The Duluth Office also installed full spectrum fluorescent bulbs. All the above technologies help minimize the need for additional lighting and its concomitant energy use and air pollution.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Energy conservation strategies have been a major focus for ATC's Facilities and Maintenance Department. Our continuous energy conservation program includes winterizing all overhead doors each fall and replacing T-12 fluorescent lighting with a T-8 fixture. The T-8 fixture is 30 percent more energy efficient than the T-12 model. All spent fluorescent bulbs are recycled by a licensed contractor. Our Facilities Team has replaced one-eighth of the exterior windows in our main facility with more energy-efficient models. This is part of a phased plan that will continue until all of the exterior windows have been replaced.

As equipment is replaced, we strive to find more efficient equipment. More efficient flat screen computer monitors have replaced most of the CRTs at our facilities to reduce energy consumption. Two 100-gallon water heaters on the main campus have been replaced with high-efficiency condensate models with a 98 percent Energy Star rating.

ATC has installed motion detection lighting systems in the restrooms of newly constructed facilities to reduce energy consumption. Security staff perform a lock down of the facilities each evening during which they turn off lights and computer monitors as they lock each classroom.

Central Lakes College, Brainerd and Staples – The college has an ongoing agreement with the local utilities to curtail usage when required. We are also phasing out T-12 lighting to retrofit to T-8 lighting.

Dakota County Technical College (DCTC) – DCTC campus buildings have been retrofitted with energy-conserving fixtures and timers. All fluorescent bulbs are recycled by Green lights.

Hennepin Technical College, Brooklyn Park – Both EPC and BPC had an energy management system installed in 1991–1992, and we continue to upgrade the system to monitor HVAC to improve efficiencies. In 1996, both campuses went through a lighting retrofit. All PCB ballasts were replaced with electronic ballasts. Also, motion detectors were added to the classrooms, offices, and corridors. In 1996, we upgraded the fire alarm system at BPC, and in 1997 we upgraded the fire alarm system at EPC. Any renovation projects that take place at HTC have energy-efficient lamps, ballasts, and motors.

Inver Hills Community College – IHCC is on a curtailment plan with Xcel reducing our power consumption rate.

Mesabi Range Community and Technical College – All new equipment purchased is up to date and is the most energy efficient possible.

Metropolitan State University –. Our policy is to operate "green" facilities. This is currently accomplished by using electronic work orders in both facilities and IT departments to reduce paper consumption, installing only energy-efficient equipment that would meet Xcel Energy rebate requirements, complete campus building recommissioning to maximize operating efficiency, monitoring power factor for maximum efficiency, lighting controls in two of four main buildings, energy-efficient lighting.

Metropolitan State is committed to energy reduction through purchase of high-efficiency equipment, employing energy-conserving strategies in state owned buildings, and procurement of products that minimize potential for air pollution.

Minnesota State University, Moorhead (MSUM) – To help better understand ways the university community can save on energy consumption, the campus is currently conducting an energy audit. This audit will

examine lighting, heating, and will include a first-ever water usage assessment. Recommendations following the energy audit will most likely include additional lighting sensors in academic and campus residence halls, steam trap reductions in the heating system, reducing water usage in restrooms, and implementing energy-saving procedures for the indoor pool area.

A new science lab building and residence hall is equipped with motion sensors for lighting in hallways, classrooms, and stairwells. This reduces the amount of time lighting is on, and increases the likelihood of lights being off when not in use.

Design and planning of a new Student Wellness Center will center on adopting practices of LEED certification. LEED (Leadership in Energy and Environmental Design) Green Building Rating System® is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. When purchasing new electronic office equipment and appliances, MSUM continues to purchase Energy Star-rated devices through state contracts or select vendors.

Northwest Technical College, Bemidji – In the past year, Energy Services Group located in Wayzata, entered into a contract with Northwest Technical College and MnSCU to provide a guaranteed energy and cost saving program. They are monitoring usages of all of our recent building, lighting, and HVAC upgrades and can provide detailed cost and usage analysis. We removed old boilers and installed three new high-efficiency boilers (90 percent), and converted from a steam system to hot water. A new computerized, digital, HVAC control system was installed that utilizes multi-point space occupancy, and time inputted technology control. A complete building lighting upgrade was done with a new digital controlled main power panel, energy-efficient lighting with motion detector controls, new LED exit lighting, vending machine controls, and one high-efficiency rooftop replacement unit that supplies HVAC to the computer labs. A complete new roof replacement project started this summer that will bring the insulation and skin up to the MnSCU roof standards. Also in the roofing project are wind breaks for the front entry and new energy-efficient windows in the entry and atrium area.

Plant Operations also uses only Energy Star-rated replacement motors. PO also makes sure that all renovations and building upgrades, remodels and additions are energy efficient to save operating costs and at the same time reduce our use of energy and pollution generation.

Riverland Community College, Albert Lea and Austin – The college has an ongoing agreement with the local utilities to curtail usage when required. We agree to curtail 165 kWs per hour when on alert, resulting in a monetary savings to the college.

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. More efficient lights are planned for our main athletic facilities. Florescent bulbs were recycled. Trash was burned in Elk River to produce electricity.

St. Cloud Technical College (SCTC) – Our college campus uses clean burning natural gas for heating and #2 fuel oil as a backup fuel only. Our building maintenance supervisor has instituted a regular preventative maintenance program to ensure the boilers are operating at peak efficiency. This ensures the fuel is burned efficiently, releasing less pollutants into the air. Lights are on automatic motion sensors; when not required, the lights turn off to conserve energy.

Vermilion Community College (VCC) –ESG and Johnson Controls have both performed initial energy assessments of VCC. Both assessments indicate guaranteed energy savings of $50,000 to $100,000 per year with $400,000 to $500,000 in energy upgrades. Discussions continue regarding entering into a contract with one of these providers. In addition, we are in the midst of replacing all appliances (refrigerators and ranges) in on-campus housing units with newer, more efficient units. The current units are 10 to 20 years old.

Department of Natural Resources (DNR) – The DNR purchases energy-efficient fluorescent lights and occupancy sensors.

North Hennepin Community College (NHCC) – At present, NHCC has renovation projects taking place in several areas. These renovated areas will have energy-efficient lamps, ballast, and motors. All used lamps are recycled by a licensed local contractor.

Department of Revenue (DOR) – The DOR has worked with the Department of Administration to first pilot and then institute a lighting program at our largest facility at 600 North Robert in St Paul. We reviewed the way we work; over the past few years we have become more computer oriented and less dependent on manual activities requiring higher lighting levels. We analyzed the building lighting as it was designed and found that for the changing work environment we were providing more light than needed, also producing more glare and related lighting issues. After a couple of pilot projects, we proposed to the Department of Administration that we remove one of the three fluorescent tubes in each of some 3,000 light fixtures throughout the building. To date only a few have been returned to the full set of three as requested by employees (3,000 lights reduced by one 32-watt tube per fixture equates to 240,000 kW per year of electricity). Lighting in the building was designed with occupancy monitoring. When an office has been vacated for several minutes, the lights go off.

Department of Transportation (Mn/DOT) – Mn/DOT is in the process of purchasing a solar-powered traffic signal. 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 updated its Standards and Procedures for Construction to address energy conservation (http://www.cppm.umn.edu/standards.html) in 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.

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.

14. Energy – Production

Department of Administration –The State Architect Office 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 designed upgrades and expansion of the on-site chiller plant to further improve efficiencies and meet the needs of the additional facilities.

Bemidji State University (BSU) – In February 2005, the Bemidji State University Student Senate passed a resolution supporting the purchase of wind-generated electricity through participation in Otter Tail Power Company's TailWinds wind energy program. Through this program, the university will purchase 61,600 kWh

of wind-generated electricity for $2.60 per 100 kWh block above the regular cost. The additional charge goes toward the further development of wind energy. The 61,600 kWh block represents the electricity consumed by the campus student union. The additional cost will be paid for out of student fees.

ESTIMATED EMISSION REDUCTIONS (IN POUNDS) FROM RENEWABLE ENERGY PURCHASES

CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
18.049	113,271.928	0.003	251.821	22.854	17.556	454.793	2.341

Nine variable frequency drives (VFD) were installed in the administration building. The drives are expected to reduce energy consumption by about 130,624 kWh. This will result in emission reductions shown in the table below.

ESTIMATED EMISSION REDUCTIONS (IN POUNDS) FROM INSTALLING VFDS

CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
38.273	240,195.330	0.006	533.91	48.462	37.228	964.397	4.964

The project cost was $6,494. The estimated annual energy savings is $5,875. A rebate of $5,921 was received for the project through Otter Tail Power Company's participation in the Minnesota Conservation Improvement program.

Energy recovery wheels were installed in a newly constructed addition to the Industrial Technology building. The devices are expected to reduce energy consumption by 188,064 kWh. The resulting emissions reductions are:

ESTIMATED EMISSION REDUCTIONS (IN POUNDS) FROM INSTALLING ENERGY RECOVERY WHEELS

CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
55.103	345,817.725	0.008	768.806	69.772	53.593	1,388.477	7.146

The project cost was approximately $52,000. The estimated annual electric savings is $9,200. A rebate of $14,018 was received for the project through Otter Tail Power Company's participation in the Minnesota Conservation Improvement program.

Department of Corrections

MCF-Rush City – Our facility uses three 550 ton high-efficient chillers that are able to be cycled on or off in stages with the Building Automation System. This results in only using cooling capacities based on actual demands, resulting in conserving electrical energy. 3,000 kW of electric generation is used when necessary for peak power sharing by the utility company. This prevents the utility company from having to build additional power generation plants that reduces pollution. The facility also makes use of alternative fuel for heating as we switch to fuel oil during times of natural gas shortages. A Computerized Energy Management System allows us to monitor and control all electrical usage at the facility. This enables us to identify and correct areas of high-energy consumption and low-power factor.

Department of Employee Relation (DOER) – DOER will expand its computer monitor power management policy to include at least 75 percent of its monitors by the end of FY 2006.

Department of Employment and Economic Development (DEED) – The following energy/pollution reduction actions were performed prior to our central office relocation to the leased space within the First National Bank Building:

- A self-contained energy-efficient heating/cooling system was installed in our large conference room/training center.
- Energy management control systems are also installed throughout the building.

Office of Environmental Assistance (OEA) – 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 1991-1996.

Metropolitan Council Environmental Services (MCES) – The largest treatment plant consumed the following energy:

	Electricity (kWh)	Natural gas (therms)	Fuel oil (gallons)
Metro WWTP	172,558,000	4,500,000	288,000

Xcel Energy worked specifically with the operators of the Metropolitan Wastewater Treatment Plant (WWTP) and the Eagles Point WWTP to achieve energy savings in lighting, electric motors, drive mechanisms, and high-efficiency boilers. The cash rebate from Xcel to MCES was $126,000.

For the Seneca WWTP, dramatic changes occurred in the operation of the incinerators. Smaller afterburners allow the adjustment of airflow to where these pollution control units can be operated in an idle "pilot" mode and still allow permit operating conditions to be met. The natural gas use of 18,836,612 cubic feet represents a reduction in fuel use of 53.4 percent.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's 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. The Brainerd office energy management system also regulates temperatures at night and on weekends to conserve energy when the building is vacant.

Electricity usage, in kilowatt hours (kWh), for the past six fiscal years (all the data we have) seems very stable. The difference from FY 2004 to FY 2005 was a 0.1 percent decrease.

Natural gas usage, in therms, in comparison was very different. For the six years that the MPCA has have data, the variability of gas usage is greater than the variability of electricity usage, perhaps directly proportional of number of heating days or severity of winter. Even so, FY 2005 natural gas use was ~18 percent lower than FY 2004 usage and the lowest usage for all six years. FY 2005 use was 20 percent below the previous five year average. October 2003 use data is missing, so the MPCA used the average of October 2002 and October 2004 data to fill the data gap. The emission reduction from the decrease in gas usage from FY 2004 to FY 2005 was quite small: 55 pounds of carbon monoxide, and 66 pounds. of nitrogen oxide reduction. Natural gas usage for future years will need to be evaluated to determine if the reduction for FY 2005 is a result of pollution prevention efforts, such as zone thermostats in the St. Paul building, or a data anomaly instead.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – ATC does not produce electrical or solar energy on its campus.

Hennepin Technical College, Brooklyn Park – The energy management systems at EPC and BPC allow us to schedule our AHUs to turn on and off at a programmed time. At the BP campus, we installed three electric York chillers in the fall of 2003 and three backup generators in 2004.

Mesabi Range Community and Technical College – The college does not have a source for electricity generated from renewable sources at this time.

Minnesota State University, Moorhead (MSUM) – As a charter member of the Capture the Wind program, MSUM has been purchasing renewable wind energy since 1999 and currently has a 10-year agreement with Moorhead Public Service to purchase a block of 333,332 kWh per year of wind-generated electricity;

this represents 2 percent of the campus's power needs.

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
97.666	612,937.204	0.014	1,362.653	123.665	94.999	2460.975	12.667

This commitment has a substantial impact on the environment, reducing the amount of greenhouse gases emitted into the air by an estimated 723,000 pounds each year. That is equivalent to planting 99 acres of trees each year or taking 72 cars off the road each year by reducing pollution. At the end of 10 years, MSUM will have prevented an estimated 7.3 million pounds of greenhouse gases from being emitted into the air, which is equivalent to planting 986 acres of trees or removing 723 cars from the road over that 10-year period. Following the implementation of a Student Green Fee during 2004, the Sustainable Campus Committee is strongly pursuing the construction of a $1.5 million wind turbine. It is proposed that electricity produced will be equal to the amount needed to operate the Student Union, Student Healthcare Center, and proposed Student Wellness Center complex.

Northwest Technical College, Bemidji – We purchase our electricity through Ottertail Power Company.

St. Cloud State University (SCSU) – As with the SCSU lighting improvements identified above in section 13, NSP also conducted an audit into all other phases of energy savings. These recommended improvements have been made as well. For instance, a new boiler was installed and is now frequently operated. This boiler operates on #2 oil, and MPCA-required air pollution testing has shown minimal (far below any action level) pollution particles being emitted from the stacks when this boiler is being operated.

Vermilion Community College (VCC) –VCC currently has a dormant wood boiler. We are considering an efficiency study to determine if repairing and using this boiler makes more sense now given the rising cost of fuel oil.

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

Department of Transportation (Mn/DOT) – Mn/DOT has 55 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 used oil sorbents are being burned to generate steam and electricity.

University of Minnesota – The University of Minnesota Initiative for Renewable Energy and the Environment (IREE) will provide the foundation for the effective use of renewable resources in Minnesota and around the globe. The initiative will draw scientists from across the university to work collaboratively on high-impact, problem-solving deep science in critical issue areas. The College of Biological Sciences, the Institute of Technology, and the College of Agricultural, Food, and Environmental Sciences are leading this effort. The initiative will also bring together university expertise with experts from the private, public, and nonprofit sectors to foster research, discovery, technology transfer, and market development of new energy sources and products from renewable resources. The initiative will serve as a point of synergy for funding, collaboration, and communications on energy-related topics. The IREE mission is to promote statewide economic development; sustainable, healthy, and diverse ecosystems; and national energy security through development of bio-based and other renewable resources and processes.

One of the innovative projects sponsored by IREE involves fuel cell generation of hydrogen from ethanol. The University of Minnesota's discovery appears to position corn-based ethanol as an appealing alternative. Lanny Schmidt, professor of chemical engineering, headed the project along with assistants Gregg Deluga and James Salge. The team's prototype reactor was able to produce hydrogen from ethanol after two simple adjustments to a process already used to get hydrogen from methane, natural gas, and gasoline. The first step was to use an automotive fuel injector to vaporize an ethanol-water mix. The second required altering the composition of the reactor's ceramic catalyst material, a combination of the elements rhodium and cerium, for the vaporized

ethanol to pass through and be converted. Schmidt says other researchers had tried similar methods but gave up because fires often developed in the reactor. Schmidt's team adjusted the process enough to avoid the fire problem.

Why turn ethanol into hydrogen rather than burn it? The answer is efficiency, Schmidt says. "Ethanol in car engines is burned at 20 percent efficiency because you have to remove the water first. But if you use ethanol to produce hydrogen, the efficiency is 50 to 60 percent because you don't need to remove the water. Hydrogen comes from the ethanol and the water." Throw wind power into the mix, and ethanol-based hydrogen becomes an even more practical energy source.

The University Outreach Center in Morris is looking at ways of using wind-generated power in conjunction with fuel cells. Facility director, Greg Cuomo, explains that using wind power to collect hydrogen is one way to store the energy of the wind. Wind power is a key part of hydrogen economy research in Europe. In many rural Minnesota and other Corn Belt communities, using wind and corn, two abundant and renewable resources, could create revitalized local economies. A rural-based hydrogen energy economy would create new jobs and income for local residents. At some point, each community or business might have its own fuel cell power plant, creating a distributed power network to make communities more energy independent.

The University of Minnesota Renewable Energy Research and Demonstration Center at Morris is a collaborative project between the West Central Research and Outreach Center (WCROC), the University of Minnesota-Morris (UMM), and the University of Minnesota Initiative for Renewable Energy and the Environment (IREE) with two primary objectives: provide a model for rural communities and agricultural producers to integrate renewable energy systems into their economies, and establish systems research that provides information to stimulate the renewable energy industry. The project currently focuses on four community scale renewable energy research and demonstration systems.

- **A hybrid wind energy system located at the WCROC**. A 1.65 MW wind turbine was completed March 2005. The turbine generates more than enough electricity for the entire UMM campus. This system has opened the possibility of developing a globally unique and important wind-to-hydrogen demonstration and research platform with leveraged funds from the Legislative Commission on Minnesota Resources. This is phase one of a three-phase plan to demonstrate and conduct vital research in the areas of stored wind energy with hydrogen, fuel mixing, and value-added products such as producing fertilizer from wind energy. Partners in this project include the Legislative Commission on Minnesota Resources, the Upper Midwest Hydrogen Initiative and member companies, Windustry, and the National Renewable Energy Lab.
- **A biomass district heating and cooling system at the UMM**. The Morris campus 2004 bonding bill has received funding to construct a $6 million biomass gasification demonstration/research system. The plant scale project will provide up to 80 percent of the campus heating and cooling needs. In additional to being a model for commercial application of biomass in heating and cooling systems, this facility would also enable University of Minnesota research to address important collection, processing, and storage issues, enable improved permitting, establish Best Management Practices to insure environmental sustainability of biomass systems, enable further development of the synthesis gas stream, and provide valuable information on the economic impact of using biofuels on rural economies. The Agricultural Utilization and Research Institute (AURI), and Minnesota Corn Growers are partners in this project.
- **The development of a Community Anaerobic Digester System** in the Morris area. This unique system proposes to produce methane at nearby livestock farms and either pipe or truck the methane into Morris for use at the local ethanol plant and/or the industrial park. This system is currently undergoing a feasibility study in partnership with the Minnesota Soybean Research and Promotion Council, the Minnesota Corn Research and Promotion Council, AURI, and the Center for Producer Owned Energy, the City of Morris, Riverview and West River Dairy, and the University of Minnesota IREE.
- **A Renewable Energy Research and Education Wing** to the WCROC Office Building. This addition will feature sustainable building design, renewable energy building technologies, and will also serve as a research and demonstration platform. The expansion is listed in the University of Minnesota's 2006 Capital Request to the Minnesota Legislature.

The systems in development at the University of Minnesota Renewable Energy Research and Demonstration Center exemplify the application of research-based knowledge utilizing local and state resources and innovative partnerships to solve real-life issues in energy, the environment, and rural development.

The University of Minnesota, Morris (UMM) was one of the first institutions in western Minnesota to purchase wind-generated electricity through Otter Tail Power Company's TailWinds program, which allows customers to choose wind power to supply at least a portion of their electricity. UMM purchased 614 blocks of wind power each month to fully cover the electric needs of the student center. According to the American Wind Energy Association, using this amount of wind energy reduces carbon dioxide emissions equivalent to planting 200 acres of trees. The project began when Otter Tail Power promoted wind power at a table in the student center and hundreds of students signed a petition to bring wind-generated electricity to the Morris campus. "Students have been very consistent in helping make environmentally responsible purchasing decisions for the campus, so we are excited to be able to power our Student Center with renewable wind energy," says Anne Olson, a junior from Falcon Heights serving on the UMM energy task force. UMM is no stranger to innovative conservation efforts. Prior to taking part in the TailWinds program, the campus implemented energy-efficient lighting and variable-speed drives on electric motors. "Because we're a large consumer of electricity, our decision to use wind power is important to advancing renewable energy resources," says UMM Associate Vice Chancellor, Lowell Rasmussen. "And the University of Minnesota, Morris, always has been on the cutting edge when it comes to pursuing conservation efforts." Despite the fact that wind energy costs an additional $1,600 a month, Rasmussen says the university will not increase its spending on electricity. Instead, conservation efforts to reduce electricity usage across campus will begin, and students will be asked to come up with ways of cutting back on electricity across the campus.

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. A 2003 marketing agreement with Xcel Energy will allow the co-generated electricity to be sold to the grid, saving the university tens of thousands dollars per month on utility costs.

The university has installed a 15 kW photovoltaic system on the roof of the Architecture Building. The unit will provide electricity to the building and be a training resource for future architects and engineers. A coordinate project is underway in which the energy from the photo voltaic collectors will be used to power an electrolyzer that separates water into hydrogen and oxygen. The hydrogen is used to power a fuel cell that generates electricity. One advantage of such a system is that by converting solar energy to hydrogen, it can be stored and used when needed. The generation of electricity in this manner produces no carbon emissions or air pollutants. Xcel Energy and the Office of Environmental Assistance jointly sponsor this project.

The university, through the 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://manure.coafes.umn.edu/research/treatment.html).

15. Groundwater Wells

Department of Corrections (DOC) – *MCF-Rush City* – Groundskeepers at Rush City use one well as a supply for an underground sprinkler system. This system is controlled by an electronic timer that turns the sprinklers off during periods of rain, when it is not needed. It also limits sprinkling during early morning hours to derive the maximum benefit and reduce evaporation that conserves water. Domestic water is obtained through Rush City.

Department of Military Affairs – The hydrogeologic mapping project of Camp Ripley has been completed. Mapping the underlying geology of the area will lead to better decision making with regard to groundwater impacts. The Camp Ripley well-head protection plan is under review.

Minnesota State Colleges and Universities (MnSCU)

Central Lakes College, Brainerd and Staples – We use our own well to supply water to irrigate the grounds at the Staples Campus.

Hennepin Technical College, Brooklyn Park – There are two wells at the EPC, one is no longer used and one is used for lawn irrigation only. There are two wells at BPC, one is no longer used and one is used for greenhouse program.

Minnesota State University, Moorhead (MSUM) – MSUM currently obtains water from only one well site. This well is located at the Buffalo River Science Center and provides water to that facility only. The well at the Science Center is an 83-foot well that utilizes groundwater from the Buffalo aquifer. This well is regularly monitored by the Minnesota Department of Health. The main campus of MSUM is supplied by Moorhead Public Service. They obtain 85 percent of their water supply from the Red River, and only 15 percent from seven groundwater wells.

St. Cloud State University (SCSU) – SCSU has a small number of groundwater monitoring wells used for research purposes.

St. Cloud Technical College (SCTC) – The wells on SCTC campus are used for lawn irrigation.

North Hennepin Community College (NHCC) – There is one deep well on site, which is used for lawn irrigation purposes only.

16. Heavy Metals

Department of Administration (Admin) – All Materials Management Division bid documents now require vendors to indicate whether their products contain mercury. This information will allow us to work with customer agencies and ascertain whether future specifications should require mercury-free products or award preferences based on mercury content. Any mercury content can then be shown on the contract release document, allowing the buyer to choose the most environmentally friendly product. In many cases, the solicitation specifications do not allow vendors to bid a product that contains mercury. MMD continues to work to reduce mercury from contracted medical products.

Department of Corrections (DOC) – *MCF-Faribault* – Old mercury switches and lead-base paint chips are collected for proper disposal.

Office of Environmental Assistance (OEA) – OEA staff continue to work at the state and national level to develop policies and programs for managing mercury-containing waste and reducing the amount of mercury entering commerce. In FY 2000, OEA awarded a grant to the Institute for a Sustainable Future to serve as project manager for the Mercury-Detecting Dog project, part of the MPCA's Mercury-Free Schools program. Clancy was introduced to the public in October 2001. He is a dog trained to detect hidden mercury in schools and other institutions and facilities. Clancy also acts as an educator and ambassador on mercury and environmental issues. This project continued during FY 2004 through an amended grant that provided for the use of U.S. EPA grant funds to support ISF's project manager activities.

OEA staff supported the ongoing work of the Quicksilver Caucus (QSC) in several areas during FY 2004. QSC sponsored a mercury workshop in October 2003 for state agency commissioners and key staff. QSC continues to address mercury stewardship, development of mercury product management and pollution prevention initiatives, and provide input to U.S. EPA and State Department on international mercury initiatives, including the UNEP Mercury Program.

OEA helped coordinate state and local government communication to U.S. EPA about the need for mercury standards for electric arc furnaces and foundries receiving mercury components in automotive and other scrap. OEA also supported legislation introduced in the 2004 legislative session that would have required automobile manufacturers to fund a collection and recycling program for mercury switches in end-of-life automobiles. The

legislation did not pass, but automobile manufacturers entered into an agreement with Minnesota Waste Wise to fund and operate a two-year switch collection and recycling program in the state. OEA developed a list of salvage yards and scrap processors in the state and supports the program in other ways.

OEA is participating in the Product Stewardship Institute Mercury Thermostat Dialogue with PSI, Thermostat Recycling Corporation, thermostat manufacturers, HVAC wholesalers and contractors, U.S. EPA Region 5, Region 5 states, Oregon, and Washington/King County. The goal of the dialogue is to increase mercury thermostat recovery and recycling across the country. TRC has agreed to expand the thermostat collection bin program to contractors and dialogue participants will be conducting financial incentive pilot projects in Indiana and Oregon starting in 2005. Dialogue continues on other program expansion measures.

Lead sinkers. OEA again sponsored a "Let's Get the Lead Out!" booth at the March 2005 Northwest Sportshow. The booth is part of a larger educational campaign to encourage anglers and outdoor enthusiasts to switch to non-lead environmentally friendly fishing tackle. OEA maintains a page on its website at http://www.moea.state.mn.us/sinkers, providing information on available non-lead alternatives, scientific research and reports, and useful links to other organizations involved with this issue. Another component of this initiative was to continue our strong interagency working relationship with DNR on this issue.

In addition during the summer of 2005, the OEA and the DNR partnered with retailers, conservation, and outdoors groups to offer lead tackle exchanges across the state. More than 30 lead tackle exchange events were held from May through August in 2004. Anglers were able to bring lead sinkers and jigs to an event to trade for non-lead ones. Thousands of anglers came to the events, and almost 1,000 pounds of lead tackle were collected.

Metropolitan Council Environmental Services (MCES) – The MCES IWPP section is responsible for administering 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 enforcement and technical assistance 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 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)	2004 (pounds)	Reduction (pounds)	Reduction (percent)
Cadmium	4,585	104	4,481	97.7%
Chromium	64,755	5,809	58,946	91.0%
Copper	66,714	5,569	61,145	91.7%
Lead	10,600	1,090	9,510	89.7%
Nickel	43,128	3,013	40,115	93.0%
Zinc	90,931	8,796	82,135	90.3%
Total	**280,713**	**24,381**	**256,332**	**90.6%**

Despite reductions of mercury discharged to the collection and treatment system since 1980, mercury is still of concern. In January 2003, the Metropolitan Council and the MDA established a jointly managed Voluntary Dental Clinic Amalgam Recovery Program. The goal of the program is to have all 741 dental clinics in the MCES service area install separators to remove amalgam from clinic wastewater prior to discharge to the sewer system. As of mid-July 2005, 90 percent of the dental clinics have made a commitment to do so, and 69 percent have installed a separator. The MDA is also promoting this program statewide with a similar success rate.

Department of Military Affairs – The DMA is scheduling pilot testing of aqueous de-painting systems. Replacement of the current sand blast de-paint system is being sought. Aqueous systems will greatly reduce the amount of heavy metal contaminated sand that is currently disposed of as hazardous waste.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Very minimal amounts of heavy metals are used on campus. ATC coordinates the disposal of heavy metals, more particularly mercury, with the University of Minnesota and the Chemical Safety Day Program.

Dakota County Technical College (DCTC) – DCTC has eliminated all mercury thermometers and thermostats. The photo technology program practices silver recovery and recycling.

Minnesota State University, Moorhead (MSUM) – Within the photo development areas on campus, silver continues to be reclaimed. Also, all mercury-bearing thermometers have been replaced by nontoxic alternatives.

Northwest Technical College, Bemidji – The Dental Program recycles their heavy metals.

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 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. (They were replaced with electronic imaging systems.) Also, about 20 pounds of video and audio 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. Many containers of heavy metal compounds were removed from SCSU using the University of Minnesota's Chemical Safety Day Program.

St. Cloud Technical College (SCTC) – During the past year, the individuals working at the SCTC campus made a commitment to remove as much mercury metal from the classrooms and labs as possible. With the help of the Minnesota Pollution Control Agency and its "Mercury Free Zone" program, a mercury survey was done at the college. As a result almost all classroom equipment is now mercury free. As thermostats, gauges etc, need replacing, we are replacing them with non-mercury-containing parts. As a result of this effort, the campus turned in approximately 85 pounds of liquid mercury for disposal or reuse. This was a significant step in preventing mercury pollution of the air, water, and ground.

North Hennepin Community College (NHCC) – Hazardous waste disposal for instructional chemicals is handled through the University of Minnesota.

Department of Transportation (Mn/DOT) – 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*.

University of Minnesota – Proactive programs of 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.

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 has installed a cloth filter system at the outflow 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.

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. 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 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 (eight 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.

17. HVAC, Indoor Air Quality

Department of Administration (Admin) – The State Architect Office specifies and administers proper flame spread materials for interior finishes to reduce or eliminate the spread of fire and toxic fumes. The State Architect Office also specifies indoor air quality standards of the Minnesota State Mechanical Code in state-owned facilities and additional requirements in their design guidelines.

The Plant Management Division coordinated with Department of Employee Relations' industrial hygienists to develop janitorial procedures for indoor air quality procedures and standards for statewide recommendations. PMD recovers and recycles all refrigerants. Travel Management Division collects all automotive refrigerants and recycles them on-site at the repair facility. MMD's refrigerants contract offers environmentally friendly alternatives to Freon.

Bemidji State University (BSU) – In FY 2005, carbon dioxide sensors were installed in all the academic buildings on campus. The sensors provide extremely fine control of fresh air intake dampers. This significantly reduces the amount of cooling and heating needed to condition the incoming air. No attempt has yet been made to quantify the actual reduction in energy consumption since the sensors have not been in place for an entire heating and cooling season and normalization factors for other variables have not been determined.

Department of Employment and Economic Development (DEED) – A self-contained energy-efficient heating/cooling system was installed in our large conference room/training center prior to relocating our central office to the leased space within the First National Bank Building.

Department of Corrections

MCF-Red Wing – Dayton Security Unit HVAC system was repaired in the fiscal year, resulting in increased efficiency of use.

MCF-Rush City – Rush City facility switched to high-efficiency filters which are replaced every 6 months. The use of antibacterial pads in the condensate drip pans prevents 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-Shakopee – The facility installed a heat energy recovery unit (1600 cfm) in the new Cosmetology area for exhausted air. It will heat the return air to 40 degrees in the winter.

Metropolitan Airports Commission (MAC) – MAC has consistently developed and remodeled facilities using energy-saving strategies. Recent boiler upgrades have resulted in efficiency increases of 20 percent. New chillers consume 33 percent less energy. Other energy-saving activities include strategic seasonal temperature

adjustments and reuse of steam for preheating boilers and powering water pumps. Additionally, MAC participates in a gas curtailment program that reduces consumption of natural gas during periods of peak demand by using jet fuel to power boilers. Lack of specific data prevents quantifying the reduction of VOC, NOx, and PM emissions resulting from increasing the efficiency of HVAC equipment.

Metropolitan Council Metro Transit – 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 complete new system was installed in 1995 to allow the garage to operate within the required standards.

In the design of the newest garage in St. Paul, Metro Transit used the latest technology in controlling the air quality in the facility by installing NOX and CO sensors throughout the building to insure proper air quality. In 2004, Metro Transit upgraded the steam heating coils at the South and Heywood garages and improve the controls for these systems. This will increase the efficiency of the main air-handling units in these buildings and help reduce the energy used to heat the buildings. Nicollet Garage will be the next garage that will have its controls upgraded to help building efficiencies.

Department of Military Affairs – The MNARNG undertook lead decontamination projects at two indoor firing ranges (IFR) locations. At one location, all IFR equipment was removed as part of the remediation process, and the IFR was converted to a storage room. The other IFR after being remediated was renovated and put back into use.

Minnesota Pollution Control Agency – At the St. Paul office, an additional fan has been installed to improve the indoor air quality on each floor. The MPCA 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 and operates efficiently, thus producing fewer emissions from any coal-fired power plants which serve it.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – As HVAC funds become available, Freon-based cooling units are replaced with roof-mounted, energy-efficient cooling systems that reduce energy consumption.

Central Lakes College, Brainerd and Staples – We contracted with Energy Savings Groups to purchase new boilers and controls at the Brainerd Campus to reduce and save energy. We have also upgraded our system at the Staples Campus.

Hennepin Technical College, Brooklyn Park – Replaced filters in all AHUs with a rating of 80 percent to collect more particles. Monitoring and testing are done periodically.

Mesabi Range Community and Technical College – Air handling units are shut off in the evening during heating season. Radiant heat only is used for heating the building during this time. A new HVAC system was installed in the 2004 remodeling project on the Virginia Campus. The HEPRA request for the Eveleth Campus, if funded, would upgrade the HVAC system and help with energy conservation.

Minnesota State University, Moorhead (MSUM) – The Department of Environmental Health and Safety, in collaboration with the Physical Plant, reviews any carpeting plans prior to installation, insuring low-VOC adhesives are used and the carpet meets the Carpet and Rug Institute's indoor air quality emission guidelines. EHandS also oversees the Indoor Air Sensitivity Program that involves the monitoring of adhesives, paints, cleaning products, etc. that may contain VOCs when used in campus buildings.

Minnesota West Community and Technical College – In 2002, Minnesota West began a multi-year program to upgrade the HVAC systems at our campus locations. To date we have invested over $2 million in new technology and infrastructure. Included in this program are computerized energy management systems,

Energy-efficient pumps and boilers and chillers. In this past year, we installed two 98 percent efficient hydronic boilers(replacing a steam boiler hydronic converter system), a new 100-ton chiller (replaced a 30-year-old unit), a multi-building 270-ton chiller (replaced multiple 30-year-old units), a state-of-the-art AHU (replaced four 39-year-old units) that serves approx 56,000 gsf.

Northland Community and Technical College – Ongoing steps taken during fiscal year 2005 to integrate pollution prevention in the college's activities; 70 percent of the college facilities have computerized HVAC systems in place.

Northwest Technical College, Bemidji – We removed old boilers and installed three new high-efficiency boilers (90 percent), and converted from a steam system to hot water. A new computerized, digital HVAC control system was installed that utilizes multi-point space occupancy, and time inputted technology control.

Riverland Community College, Albert Lea and Austin – Both Austin campuses have new HVAC systems in the last five years that are more energy efficient than the old ones, allowing us more control over what we heat and cool when. The Albert Lea campus has four new rooftop units replacing 35-year-old inefficient units.

St. Cloud State University (SCSU) – SCSU is using a carbon dioxide chart recorder to assist in ventilation troubleshooting. Custodial staff, HVAC staff, HR personnel, and DOER Industrial Hygienists have become much more involved in complaint and mold response. Many special forms are being used to procure and track occupant data. MacNeil Environmental Inc. (MEI) has performed six air sampling surveys expanding to seven buildings. The Painting Department not only uses water-based paints and varnishes but is also upgrading ventilation controls to improve indoor air quality. A paint spray booth was added to room 113 of Headly Hall. Strict carpet emission controls are used extensively to limit volatile organic compounds (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. SCSU Health Services, Maintenance, Public Safety, and Lindgren Child Care Center heads are taking the lead on disaster planning and participated on campus in a large scale simulated mustard gas release as part of a community drill. Over 100 campus volunteers also participated in the toxic gas release mock disaster simulation.

St. Cloud Technical College (SCTC) – Indoor air quality at St. Cloud Technical College is a high priority. A regular preventative maintenance program is in place to ensure the HVAC system is clean, filters are changed periodically and the system is operating at peak efficiency. This ensures good indoor air quality for the employees and students. Certain areas/labs at SCTC will have air quality monitoring scheduled to ensure clean indoor air.

Vermilion Community College (VCC) – FY 2006 HEAPR request includes $1.5 million for phase-one work to upgrade 35-year-old air handlers and one boiler.

North Hennepin Community College (NHCC) – We plan to continue our program of monitoring/testing indoor air quality. Last year we tested our Fine Arts facility.

Department of Transportation (Mn/DOT) – Mn/DOT buildings use air-to-air heat exchangers in the laboratory and rest stop areas. This is done to save energy and condition the building environment. Fresh air is controlled digitally through building automation systems to maximize energy savings and comfort.

University of Minnesota – The university hosts an indoor air quality 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.

The university has started a project to replace aging building chiller units on the St. Paul campus with an energy-efficient centralized chiller plant. 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 lifespan. Of 38 chillers used on the St. Paul campus, 32 are in dire need of replacement in the next six years. The 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. 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 (Admin) – The Materials Management Division and the Department of Transportation have developed a contract for alternative blend deicer used in a mixture with alternative deicer, regular salt, and sand. This blend reduces salt use and can be used successfully at lower temperatures. The contract will be expanded to include more plant-based alternative products. The Department of Transportation is continually reviewing new products and as approved, MMD adds them to the state contract. Some of these alternative deicers are corn-based. The Plant Management Division is currently testing various programs to reduce chemical usage during the winter season. MMD is continuing to work with the Department of Transportation to develop an approved products list for alternative chemical deicers. Alternatives are sought that will reduce groundwater contamination and be less harmful to plants, shrubs, and trees, thereby reducing the amount of plant debris sent to landfills, etc.

Bemidji State University (BSU) – A liquid snow and ice removal product is being used, primarily on entryways to campus buildings, to reduce sand and salt use. Salt and sand is still more cost-effective for large-scale use, such as parking lots and sidewalks.

Department of Corrections (DOC) – *MCF-Rush City* – The groundskeepers use magnesium chloride ice preventer on walkways. Sand is the principal product used in the units and on roadways when needed.

Metropolitan Airports Commission (MAC) – The MAC's Field Maintenance personnel continually evaluate ice control methods for runways, taxiways, and roads. A number of products are approved for use by the Federal Aviation Administration on airport runways and taxiways. The MAC has chosen two products that are as environmentally friendly as possible while also performing to exacting standards. Solid sodium acetate and liquid potassium acetate are applied depending on specific conditions, including the type and amount of precipitation, as well as the temperature.

Since mechanically removing ice and compacted snow can be more effective in some cases than the use of chemicals, MAC has added runway brooms to its fleet of snow removal equipment. In a single pass, an 18-foot-wide rotating broom essentially strips the pavement bare of any ice or snow. The use of these brooms greatly reduces the need for chemical deicing, and in many cases eliminates it entirely. It is estimated that use of chemicals for pavement deicing has been halved by using runway brooms. Evaluation of new snow removal equipment and methods is ongoing.

Another form of ice control is aircraft deicing, using glycol-based deicing fluid. A glycol containment system at MSP has been designed to significantly reduce the amount of glycol-impacted storm water finding its way to the Minnesota River. Most aircraft deicing takes place on concrete deice pads located near the runway ends. Runoff from the pads is collected and contained on site until it can be recycled or discharged to the sanitary sewer for treatment under an Industrial Discharge Permit with Metropolitan Council Environmental Services. The airline tenants also use glycol recovery vehicles to vacuum-sweep deicing area surfaces that are outside the deice pads or the designated "plug and pump" containment area.

Minnesota Pollution Control Agency – In May 2003, the agency renegotiated its lease on its St. Paul office building. As part of that lease, the MPCA required the use of deicing products that do not contain high levels of chlorides or urea. This does not affect criteria air pollutants, but does contribute to less toxic runoff for water quality.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Heating units have been installed in several sidewalks accessing campus facilities. This is a phased program that will continue over the next several years. Heated sidewalks greatly reduce the need for sanding and deicing chemicals in addition to reducing the ergonomic hazards associated with snow removal. A calcium chloride based product mixed with sand is applied after snow and ice removal to unheated walkways, as needed, for ice control. Gutters installed above entrances and walkways also reduce ice accumulations caused by snow melt.

Dakota County Technical College (DCTC) – DCTC uses a 40/60 sand/salt solution on parking lots and sidewalks to ensure the safety of students and staff.

Hennepin Technical College, Brooklyn Park – Sidewalks and parking lots are cleared of snow and a mixture of sand and salt are then applied where needed. A plowing contractor performs snow removal on five of the parking lots at each campus whenever there is two inches or more of snowfall. The remaining areas and other lots are done by the Maintenance Department.

Minnesota State University, Moorhead (MSUM) – The university's Physical Plant aggressively removes ice and snow and uses sand-only methods of ice control on campus sidewalks, parking lots, and other susceptible areas. Each spring, the remaining residue is swept up and recycled at the city compost site.

Northwest Technical College, Bemidji – We use a brush-mounted sweeper in the winter to minimize the amount of sidewalk deicers.

Riverland Community College, Albert Lea and Austin – It is an ongoing practice of the colleges to sand and grit walkways, drives, and parking lots on an as-needed basis.

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. An additional sanding unit allowed improved sidewalk sanding response. Very little mix was stockpiled. It was kept on a slab and covered with tarpaulins to control salt leeching.

St. Cloud Technical College (SCTC) – The Building Maintenance employees use environmentally friendly ice melt on our sidewalks. This cuts down on the use of straight salt.

North Hennepin Community College (NHCC) – All sidewalks are cleared of snow and ice, and ice melt is applied as needed throughout the winter. A 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.

Department of Transportation (Mn/DOT) – Mn/DOT conducts extensive research annually on ice control equipment, materials, and methods. This research has shown some dramatic results.

- The largest success to date comes from the research into anti-icing and pre-wetting of salt or salt/sand mixes for snow and ice control. Pre-wetting methods have shown a 20 percent or more reduction in salt/sand usage. Pre-wetting has been implemented statewide to various degrees and is still expanding.

Anti-icing was initiated in 2002-2003. The procedure has the potential to reduce overall snow and ice expenditure by reducing material equipment and labor.

- In the past few years, new alternative deicers have entered the marketplace. Mn/DOT actively evaluates salt replacements that demonstrate lessened environmental impacts while maintaining or increasing roadway safety.
- Mn/DOT Maintenance has developed a Snow Plow Operator Training Program. The program provides consistent, statewide training for operators with established standards for performance. Trainees spent 10 days at the Camp Ripley in classroom and field training exercises.
- The Circuit Training and Assistance Program provides training in the latest transportation-related technologies to personnel from townships, cities, counties, and the state. The Snow and Ice course will utilize the new Snow and Ice Field Guide. This guide will help promote the understanding of the tools, best practices, and limitations for snow and ice control. In addition, it encourages progressive changes in snow and ice control practices that will help reduce salt and sand use and reduce environmental impacts.

Mn/DOT anticipates that with equipment innovations such as zero velocity spreader, greater use of road weather information, anti-icing and pre-wetting, as well as operator training, deicing chemical and sand usage can be reduced even further.

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 sand, and less fuel burned are balanced against very little loss in utility or safety.

19. Laboratory

Department of Administration (Admin) – 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 provides alternatives to laboratory media containing formaldehyde and heavy metals where scientifically possible. MMD, in conjunction with the Minnesota Pollution Control Agency, has four full-service state contracts and will have four regional limited-service contracts for environmental sampling and analysis. These contracts are available to all state agencies.

The Materials Management Division, in conjunction with the Department of Transportation, has developed a contract for the purchase of n-propyl bromide, which is used in place of 1-1-1 trichloroethane for testing bituminous road aggregate. This is a much safer and environmentally friendly process, and produces less toxic waste and vapors.

The Plant Management Division and State Architect Office:

- designed high-efficiency, energy-saving hood controls for the laboratory areas of the Department of Agriculture and Health Laboratory building presently under construction.
- are designing high-efficiency, energy-saving hoods for the laboratory floor of the Bureau of Criminal Apprehension building.
- have approved the use of total heat recapturing technologies for the Department of Agriculture and Health Laboratory building presently under construction.

Department of Agriculture (MDA) – The Agronomy work unit's inductively coupled plasma mass spectrometer has helped reduce 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 was 15 gallons, saving on the cost of hazardous waste removal this year. Method development and

additional equipment is being investigated to further reduce this waste stream. In FY 2003, the laboratory's Environmental Analysis waters section acquired a solid phase extraction system, which has reduced the amount of methylene chloride used within this area. The lab ordered a total of eight liters of methylene chloride in fiscal year 2004 and did not need to order any quantities of the chemical in fiscal year 2005. The benefit to this system is a reduction in both hazardous waste generated as well as a reduced employee exposure to the product.

Bemidji State University (BSU) – The BSU Chemistry Department continues to incorporate micro-scale laboratory techniques into its courses. This reduces both the amount of hazardous wastes generated and the amount of new chemicals needed.

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 (DOC) – All facilities collect and dispose of medical and biological waste as required, utilizing approved methods and vendors.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's 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 and tank tie downs in the tank/hazard storage room to comply with State Fire Marshall Code. These requirements do increase energy use, but do save on materials being discarded needlessly.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – All campus laboratories collect and dispose of medical and biological waste in approved containers and according to OSHA standards. Chemicals no longer in use by the laboratories are managed through the University of Minnesota's Chemical Safety Day Program. All employees receive blood-borne pathogen training, including a review of our written response plan, on an annual basis.

Minnesota State University, Moorhead (MSUM) – A new science laboratory building on the MSUM main campus allows centralized control over laboratory practices for the Biology and Chemistry Departments. This new centralization has lead to the development of a chemical inventory system. This system allows faculty to track and inventory chemicals at MSUM facilities. This eliminates the need for duplication of chemicals and provides less waste.

Extensive safety and procedural training/testing are required of all students participating in chemistry labs. Neutralization is taught and incorporated in many experiments, producing a sewer-friendly product. The Department of Biology recently cleaned out stores of excess formaldehyde and reduced the amounts of currently used formaldehyde-preserved specimens. The waste product was disposed of through the Department of Environmental Health and Safety's Hazardous Waste Program.

St. Cloud Technical College (SCTC) – As the laboratories and classrooms are being updated at SCTC, new and updated equipment is being installed to prevent pollution of the air. (Air filtering systems in paint booths, welding areas, and labs to prevent pollutants from being released into the air.)

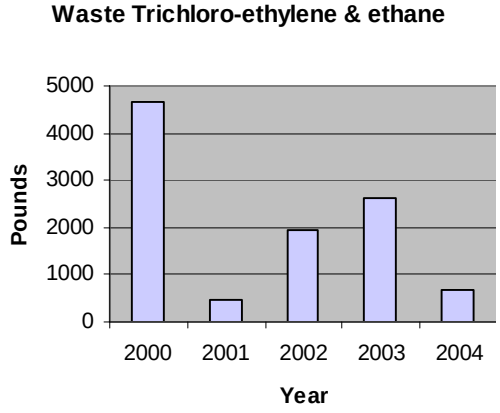
St. Cloud State University (SCSU) – MacNeil Environmental Inc. (MEI) trained science staff and faculty last winter on pollution prevention and waste minimization at SCSU as part of OSHA Laboratory Standard training. MEI's role has expanded to include principal consultants, special audits, and having a Certified Industrial Hygienist on campus almost daily. There is a bigger focus on radiation controls. Health Services is improving policies and laboratory controls as a result of voluntary OSHA Industrial Hygiene inspection partnering. They have been very proactive in upgrading blood-borne pathogen controls, and both written response plans and cleaning/disinfection schedules.

The Chemistry Safety Committee and Chemical Hygiene Officer and new assistant 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 to identify and remove over 70 unknowns. A staff member (recently added to the SCSU Chemistry department) has made major progress in hazardous waste controls and better utilizing local city sewer system (POTW) contacts and treatment criteria to save over $7,000. Peers have teamed with the University of Minnesota to recycle surplus laboratory glassware.

After-hours work controls and the Chemical Hygiene Plan reviews have received special emphasis in all College of Science and Engineering departments having labs. Renovations have included the addition of more plumbed eyewashes. Better Formaldehyde and mercury controls are being used.

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

Department of Transportation (Mn/DOT) – Mn/DOT materials laboratories have replaced 1,1,1-trichloroethane, which is hazardous and very expensive to manage and dispose of, with n-propyl bromide used with asphalt extraction waste. N-propyl bromide waste is nonhazardous and 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. Mn/DOT staff discovered 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 not only that less virgin solvents must be produced but also that less waste solvents need to be disposed of. The projected cost savings to the university, if the distillation and marketing focused solely on acetonitrile, would be $800 in avoided disposal costs and $30,000 in avoided solvent purchases for the annual system capacity of 1,200 liters of recycled acetonitrile. Total projected annual costs are $10,800, yielding 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 Administration (Admin) – The Plant Management Division composts yard waste whenever practical.

Bemidji State University (BSU) – The university continues to maintain over 600 feet of Lake Bemidji shoreline with native plants and rocks as part of a lake shore restoration and stabilization project that was completed in 2003.

Department of Corrections (DOC) – *MCF-Rush City* – Has runoff ponds for the collection of surface water that have created acres of wetlands.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's central office landscaping volunteer group maintains 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, and insects).

The MPCA Brainerd office will be reviewing and approving all exterior landscaping plans. The staff has requested that native, drought-tolerant landscape plants be used around the building.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Landscaping of newly developed areas employ xeriscaping designs to reduce the use of gasoline-powered maintenance equipment, fertilizers, and also to reduce fire hazards.

Central Lakes College, Brainerd and Staples – We reduced our maintained grounds by four acres by planting prairie grass and building ponds and gardens. We are on a ongoing reduction phase.

Dakota County Technical College (DCTC) – We are employing landscaping techniques that will reduce the need for gas-powered maintenance equipment. DCTC has upgraded the landscape equipment to the most fuel-efficient available. We avoid mowing on pollution alert days.

Inver Hills Community College – The grounds staff has installed more planting beds and landscaping to reduce the amount of grass to water and cut, allowing us to reduce our use of gasoline-powered equipment.

Mesabi Range Community and Technical College – Some re-landscaping is being done, and more is being considered in the future for reducing the need for gasoline-powered maintenance equipment.

Metropolitan State University – Our policy is to operate "green" facilities. This is currently accomplished by installation of approximately one acre "no maintenance" landscaping. Our campus master plan includes more low-maintenance landscaping in the courtyard area. And landscaping that maximizes native plants, minimizes maintenance, and reduces need for gas-powered equipment.

Minnesota State Community and Technical College, Wadena Campus – Our plans are to turn about two acres of grassland into parking lot as well as landscaping around the building replacing grass with flower beds and shrubs.

Minnesota State University, Moorhead (MSUM) – Currently MSUM is exploring new landscaping options for the facility storm water detention pond. The available changes may include conversion into a wetland retention area, and reintroduction of native grasses. For the main campus, current procedures for lawn, tree, and flower maintenance are being reviewed to reveal areas where improvement is needed. Due to the large grassy mall area in the center of campus, it is difficult to make improvements without drastic changes to its aesthetics and character. During the past year, approximately one-half acre of perennial gardens have replaced lawn grass areas in and around buildings, especially those areas close to building air intake systems. This practice requires less mowing and decreases indoor air quality issues from engine exhaust being brought into the building's air intake systems. These new perennial gardens equate considerable emissions reductions (see table).

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
247.972	454.359	0	1.372	0.771	0.710	0.093	9.964

MSUM's Regional Science Center, however, has implemented a minimum landscaping policy. The

Science Center is home to natural prairie and large wooded areas. Very little mowing is provided, which not only reduces fuel consumption and emissions, but also allows the Science Center to promote an environmentally friendly image. Weed control with invasive leafy spurge is being done without the use of pesticides. Instead, MSUM has implemented a control program that uses *Aphthona nigriscutis*, the Black Dot Leafy Spurge Flea Beetle, to help control leafy spurge. As adults, the beetles feed on the foliage, but do not severely harm the plant. However, the larvae live in the root system and feed on the roots, thus killing the plant. So far, after introduction the beetles are colonizing and results in weed control have been noted. This program not only saves money and labor, but is also extremely environmentally beneficial due to the close proximity to the Buffalo River and Buffalo State Park.

Minnesota West Community and Technical College – This past year, Minnesota West landscaping efforts have reduced lawn areas by 4,500 square feet. And we have reduced the amount of trimming by approximately 40 percent. We are purchasing four-cycle engine trimmers to replace our two-cycle engine equipment at all locations.

Northwest Technical College, Bemidji – We use 62-inch and 90-inch lawn mowers to reduce the amount of time spent with gas engines running. We have added paved patio areas and sidewalks around the building to reduce the amount of trimming time required.

Riverland Community College, Albert Lea and Austin – This past year the college has reduced mowing and trimming in a few areas.

St. Cloud State University (SCSU) – SCSU has joined with the city of St. Cloud on many of their storm water control plan initiatives, including community outreach/education and public meetings. Many initiatives involve landscaping, catch basin overflow and construction project runoff controls. Leaves, sand, silt, curb drains, and point outfalls are also being monitored and better controlled.

St. Cloud Technical College (SCTC) – Building expansion and planting trees is reducing the amount of grass that needs to be cut.

Vermilion Community College (VCC) –We intend to approach a landscape architect firm about a landscape plan for the entire campus. This plan would include reducing the amount of manicured turf on the campus in favor of allowing areas to revert to their natural state.

Department of Transportation (Mn/DOT) – 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. Mn/DOT uses an integrated vegetation management approach for managing roadside vegetation that combines the use of appropriate herbicides, biocontrol organisms, precision mowing, and ongoing training through internal workshops and conferences. This limits the use of herbicides.

Mn/DOT uses native plant materials in storm water ponds, vegetative swales, micro-detention cells for mechanical and biological capture of transportation-origin solids and chemicals. Several handbooks for field personnel have been developed for erosion control during construction. Mn/DOT is developing environmental standards for wetland restoration, storm water treatment technologies including infiltration recharge basins, ditches, belowground storage, and for bay treatment. Mn/DOT has installed the first living wall composed of compost to increase the concentration time in a storm water pond in Golden Valley. Compost has been used successfully as an erosion control blanket. Mn/DOT also developed a CD-ROM, *Woody and Herbaceous Plants for Minnesota Landscapes and Roadsides*, which is now available interactively online.

University of Minnesota – Composting is an important effort of the University of Minnesota Landcare Department, making our campus more sustainable. All of the yard waste and refuse collected from the campus greenhouses is composted. This compost is then used around campus to control the weed-seed germination, conserve water, moderate soil temperature extremes, and reduce the compaction effects of heavy rains and sprinkler irrigation. Composting keeps this waste out of the waste stream and incorporates it back into the environment.

The University of Minnesota Landcare Department partners with Xcel Energy to recycle woody materials. The university provides space on campus to store the woody material and the wood waste. Xcel chips all the wood that is collected, and the University uses the wood mulch around campus. This partnership saves the university about $10,000 a year in materials alone, in addition to the labor saved by Xcel taking over the wood chipping.

CUES, Center for Urban Ecosystems and Sustainability (http://www.entomology.umn.edu/cues) was created in 1995 with a grant from the Minnesota Extension Service. CUES is an interdisciplinary program with participants from the Colleges of Agriculture, Food, and Environmental Sciences; Biological Sciences; Natural Resources; and Landscape Architecture. The CUES resource center is located in the Andersen Library at the Minnesota Landscape Arboretum. CUES mission is to educate landscape managers and urban residents about ways to embrace environmental stewardship by practicing sustainable management. A landscape managed through sustainable methods requires low inputs of labor, fertilizers, herbicides, insecticides, and fungicides. Excessive use of these chemicals can pollute surface and ground water and disturb natural ecosystem processes. Sustainable management embraces four major principles:

- **Conserving bio-diversity.** The naturally diverse landscape discourages outbreaks of disease or insects. Such a landscape also attracts birds and butterflies.
- **Restoring native vegetation.** Consider using native vegetation in landscapes. Restore native vegetation to shorelines to reduce nutrient enrichment through stabilizing sediments and shorelines.
- **Promoting nutrient recycling through composting.** Backyard and community composting is an ecologically sound way of disposing of yard wastes and increasing nutrients in urban soils.
- **Using integrated pest management to control insects and diseases.** Inspect and monitor your plants' health on a regular basis, before problems are out of control. Instead of routinely spraying for insects, spot treat problems of soft pesticides such as soaps, oils, and bio-rational products such as Bt (commercial formulations of *Bacillus thuringiensis*). Adopt these bio-rational practices, which target the pest and not the naturally occurring biological control agents such as parasitoids and predatory insects. Use naturally resistant plants. When necessary use hard pesticides, timed to the vulnerable stage of the insect, so the application has a major impact on the pest.

The Sustainable Urban Landscape Information Series (SULIS) has developed a Sustainable Lawn Care Information Series (http://www.sustland.umn.edu/maint) to assist homeowners to create a sustainable lawn. According to one estimate, 40 million acres of land is devoted to turfgrass in the United States with nearly 75 percent in home lawns and more than $30 billion spent on annual lawn maintenance. It is no wonder that the large amount of resources allocated to lawn care and the impact that they have on the environment has called the sustainability of lawns into question. This critical attention has challenged lawn managers and turfgrass research programs across the country to develop and work toward more sustainable, lower input turf/lawn ecosystems. While SULIS defines sustainability in a general way, sustainability as it relates to lawns can be defined as a lawn area that requires few material inputs while having a positive impact on the environment. Creating and maintaining a more sustainable lawn begins with proper selection of the best-adapted grass species and varieties. Proper site preparation, lawn installation, and appropriate follow-up care will help reduce the need for inputs of the established lawn.

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 the Twin Cities campus. The building of raingardens 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 University of Minnesota Extension maintains Sustainable Urban Landscape Information Series (http://www.sustland.umn.edu/). This outstanding website 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, *Design*, takes users on a detailed trip through the process of envisioning, planning, and designing landscapes that are cost effective, visually pleasing, and easy on the environment. The next section, *Plant Selection*, 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://www.cala.umn.edu/landscape_architecture). 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 a further means of realizing the potentials of landscape architecture as well as a means of asserting the necessity for ecological responsibility in design and planning. The mission of the Department of Landscape Architecture is to foster sustainable relationships between people and their environment. Fundamental to this commitment is the belief that design skills forged from a deep understanding of the intrinsic physical and aesthetic characteristics of natural processes is the best way to help people conserve, rebuild, and steward the natural and cultural places within which their lives and communities unfold. The department pursues this mission through teaching, carrying out research, and actively working with communities to develop and apply place-based solutions to local and regional landscape issues. Specifically, the department:

- Teaches students to be professional landscape architects who use ecological thinking as the basis for artistic design.
- Develops new knowledge about the interrelationships between human and natural systems through scholarly and applied research.
- Helps communities and public groups understand, shape, and manage local places using participatory thinking and incremental planning.
- Collaborates with other professionals within and outside of the university to seek effective design solutions to landscape issues.
- Fosters design literacy based on ecology, technology, history, behavior, place theory, and art.
- Teaches students a working knowledge of Minnesota's natural and cultural ecosystems.

21. Materials Exchange

Department of Administration (Admin) – The Materials Management Division through its Surplus Services administers Minn. Stat. §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 Travel Management Division's material exchange is accomplished through Surplus Property when property has useful life remaining. The State Architects Office writes recycling and reuse of materials and proper handling of hazardous materials into all building construction specifications.

Department of Corrections

MCF-Moose Lake/Willow River – Moose Lake/Willow River donated 30 CPR masks to a local rural volunteer fire department's First Responders rather than dispose of them.

MCF-Rush City – Cardboard is recycled, and a vendor picks up and reuses pallets. Cooking oil/lard is picked up and recycled by an outside vendor. Food waste is picked up by a pig farmer twice weekly, which reduces the amount of waste being disposed of. Plastic, paper, tin, and aluminum recycling has been established at the facility.

MCF-St. Cloud – Has begun recycling mattresses rather than disposing of them in the landfill.

Office of Environmental Assistance (OEA) – The Minnesota Materials Exchange Alliance developed an effective materials exchange infrastructure in Minnesota and fosters coordination and greater utilization of reuse in the hierarchy. The use of the materials exchange program resulted in a total of 478 successful exchanges of 9 million pounds of solid and hazardous materials, saving companies $1,429,855 in avoided purchase and disposal costs. Exchanges are successful across various types of organizations, with the greatest number in the commercial services sector, which includes retail, offices, real estate, recyclers, printers, dry cleaners, and others. The top five materials exchanged include pallets, plastic drums, office furniture, packing peanuts, and plastic buckets. Materials exchange staff responded to over 466 calls in 2005 and helped facilitate over 21,000 Web self-referrals to the online database. Website and database support continued for the nine exchange sites including:

Materials Exchange Programs in Minnesota - contact numbers

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, St. Louis County	218-749-9703 or 800-450-9278
Northeast, WLSSD	218-740-4784
Otter Tail County Materials Exchange	218-998-8598 or 218-998-8597
Southeast Minnesota Recyclers Exchange (SEMREX)	507-529-4526
Southwest Minnesota Materials Exchange	507-532-8210
West-Central Materials Exchange	218-299-7329

Eureka Recycling, which developed and maintains the Twin Cities Free Market waste exchange program, received a 2003–2004 grant from the OEA to expand and update the program as part of their efforts to improve multi-family recycling in Minnesota. The service area for the program was limited to the city of Saint Paul and Washington and Anoka Counties, but, under the grant, was expanded to cover the entire metro area. The final product of the grant included materials for metro communities to promote the website to their citizens.

Metropolitan Airports Commission (MAC) – MAC promotes reuse internally through a policy of the purchasing department. An established procedure outlining the steps to take when MAC-owned property is no longer needed ensures that MAC employees/departments are aware of the availability of surplus items, eliminating redundant purchases. Countless items have been kept out of the waste stream and reused in this manner.

Department of Military Affairs – Materials not being used by a unit due to mission change or other reasons are being exchanged with units that have a need for the materials. This eliminates the potential for shelf life expiration and the need to order materials that are available through other units

Minnesota Pollution Control Agency – At least twice a year (during Earth Week and the holiday season), the Alliance for Recycling and Reduction of Waste (ARROW), a group of MPCA employees who serve as a point of contract for any recycling (reuse, reduce, or rethink) or composting questions, organizes a treasure table. Usable, but unwanted, items from staff are brought in and placed on a table for others to take and reuse. In 2004, participation in this activity had increased, and the treasure table was extended for an additional week. In 2005, staff showed great interest in the table for the two times it was in operation.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Obsolete, but useable materials are exchanged according to the procedures outline in Minn. Stat. §16C.23, subd. 6.

Minnesota State University, Moorhead (MSUM) – Used PCs are reallocated to other departments on campus to reduce the need for additional and/or new machines. Recently used PCs have also been made available to student organization and nonprofit use. This program reduces the number of discarded computers on campus and saves budget money for many departments.

Each year MSUM hosts the Great Garbage Giveaway where departments can get rid of unwanted materials that are of no use to them, any other department, and/or agency. Promotions for this event are publicized both on and off campus.

The existing recycling program on the MSUM main campus is scheduled to undergo modification during the 2005–2006 academic years. These improvements include assessment of collection areas, program expansion, and improving recycling education and resources.

St. Cloud State University (SCSU) – Glass, plastics, aluminum cans, steel, carpet, some building materials, Styrofoam, and cardboard are recycled at SCSU; also lard and cooking oil. A local farmer's hogs are fed leftover food.

North Hennepin Community College (NHCC) – 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.

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 and laboratory glassware within the university community. The program distributes approximately 1,000 kilograms of chemicals per year that would otherwise be disposed of as hazardous waste.

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/reuse). The target audience is the university community, nonprofits, and the general public. Available items are listed and often shown on their web page.

22. Office Supplies

Department of Administration (Admin) – The Resource Recovery Office obtains office supplies and paper from its reusable office supplies area at the State Recycling Center. The Materials Management Division's Office Supply Connection and S&T Office Products had 3,117 recycled products available in FY 2005, down slightly from 3,128 products in FY 2004. Total sales of recycled products through June 2005 was $2,440,239 (of this total, OSC sales were $2,138,403, S&T Office Products sales were $301,836). This is up $165,644 from FY 2004 sales figures, with the increase attributed to higher recycled sales through OSC.

Material Management Division's OSC has 25 recycled dated products (At-A Glance) available. The products are advertised on the website and a special spring flyer is distributed with a recycle logo identifying these recycled products containing 30 percent post-consumer waste. Also, all 35 At-A-Glance products that are offered through OSC are printed with 100 percent soy-based inks and packaged in cartons containing recycled

content. These dated products can be purchased by placing a web order, or can be purchased by printing an easy-to-use website form and faxing this form to OSC.

OSC stocks 36 recycled papers including eight white papers in various sizes and various post-consumer waste contents. In FY 2005, sales from these white papers were $1,300,941. One of these white papers contains 100 percent post-consumer content, is processed chlorine-free, is acid-free for a long bright life, and has outstanding opacity for two-sided copying. This product exceeds all state and federal requirements for recycled content. Because of the higher cost of this product, OSC subsidizes the price to its customers by charging a smaller markup to cost. This allows the environmentally friendly and waste-reducing paper to be competitively priced. The stocked colored papers at OSC that contain 30 percent post-consumer waste accounted for another $92,044 in sales in FY 2005.

OSC offers an electronic online catalog that reduces paper consumption by allowing customers to order online without the need to fax or mail an actual order form. A convenient, express order form allows faster order placement without the need to have a printed catalog. The goal for FY 2005 was to receive at least 51 percent of the orders online. To help achieve this goal, OSC is offering an additional 1 percent discount on inventory items purchased using the website. OSC expects this number to continue to grow as more customers realize the ease and speed of ordering through the electronic catalog. Also, since all special prices and/or discounts are automatically reflected on the online order form, all web customers are assured of getting up-to-date competitive pricing as well as the most current product information. OSC's invoices are printed on recycled paper. In addition, all newsletters and price lists are available online.

The program initiated by OSC in conjunction with S&T Office Products and General Ribbon Corporation of providing remanufactured laser toner cartridges continues. These cartridges are performance guaranteed and are put through GRC's intensive factory certification process, which ensures quality performance. Used and empty cartridges are returned to OSC, palletized, and sent back to GRC for remanufacturing. MMD buys only 100 percent post-consumer recycled paper for all of its printers and copiers. MMD recycles laser printer cartridges and only buys remanufactured printer cartridges.

The Risk Management Division continues to request soy-based ink for printing orders, and recycles printer and typewriter toner cartridges. MMD recycles laser printer cartridges and only buys remanufactured printer cartridges.

Administration has used:

- 50 reams of virgin paper
- 3,527 reams of 30 percent post-consumer recycled content paper
- 2,480 reams of 100 percent post-consumer recycled content paper

This represents to manufacture for virgin paper 961.59 BTUs, for 30 percent 299,543.86 BTUs, and for 100 percent 134,276.5 BTUs. Green house gas emission in CO2 equivalents is 141.99 for virgin, 45,264.38 for 30 percent, and 22,209.02 for 100 percent. Wood in pounds is 173.99 for virgin, 43,497.79 for 30 percent, and 0 for 100 percent.

Department of Agriculture (MDA) – The Minnesota Department of Agriculture has made a commitment to reduce state energy use through purchasing energy-efficient office equipment and appliances. The department has done this through adopting a "neighborhood center" design concept in its new facility, thereby significantly reducing the number of office appliances needed. See item d under Part 3: *Quantifiable Measurements for Activities Satisfying Executive Order 04-08.*

FY05 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

Paper type	Reams	CO_2 emissions (pounds)	Wood use (pounds)
30% post-consumer	6,534 reams		
Virgin	3 reams		
Total	**537 reams**	**82,541.2**	**79,330.8**

No data available for fiscal year 2004.

Bemidji State University (BSU) – 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 ($1,500-$1,700 per year).

FY05 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

Paper type	Reams	Energy (BTUs)	CO_2 emissions (pounds)	Wood use (pounds)
30% post-consumer	4,400 reams (8.5 x 11")	367,641	55,555	53,386
Virgin	6,810 reams (8.5 x 11", 14", and 17" paper)	655,038	96,725	118,074

FY04 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

Paper type	Reams	Energy (BTUs)	CO_2 emissions (pounds)	Wood use (pounds)
30% post-consumer	4,403 reams (8.5 x 11")	367,908	5,5595	53,425
Virgin	6,816 reams (8.5 x 11", 14", and 17" paper)	656,477	96,938	118,333

Department of Commerce

FY04/05 PAPER CONSUMPTION

Paper type	Virgin	30% post-consumer	100% post-consumer	Total	Wood use (pounds)	Greenhouse gas emissions (pounds)
FY04	0	6,790	0	6,790	82,385	85,731
FY05	0	7,681	0	7,681	93,196	96,981

The department consumed 445,500 more sheets of paper between FY 2004 and FY 2005.

Department of Corrections (DOC) – The following data represents the impact of paper use reported for all DOC facilities, the Central Office, Field Services, and MINNCOR Industries.

FY05 VIRGIN PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

	FY 2004	FY 2005	Net change
Reams	8,400	10,840	2,440
Weight (tons)	21	27	6
CO2 emissions (pounds)	119,270	153,351	34,081
Wood used (pounds)	145,599	187,199	41,600

FY05 30% POST-CONSUMER PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

	FY 2004	FY 2005	Net change
Reams	48,000	47,188	(812)
Weight (tons)	120	118	(2)
CO_2 emissions (pounds)	606,050	595,949	(10,101)
Wood used (pounds)	582,398	572,690	(9,708)

FY05 100% POST-CONSUMER PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

	FY 2004	FY 2005	Net change
Reams	310	3,380	3,070
Weight (tons)	0.75	8	7.25
CO_2 emissions (pounds)	2,686	28,656	25,970
Wood used (pounds)	negligible	55,466	55,000

MCF-Faribault– The facility uses Document Destruction recycling for a large portion of our office products, resulting in a savings to landfill 32,000 pounds of paper.

Office of Environmental Assistance (OEA) – The OEA uses Savin IKON copier machines, which have removable toner cartridges that are capable of being refilled and are made of high-density polyethylene plastic. The OEA uses primarily 100 percent post-consumer copy paper processed without chlorine. In 2005 OEA used 550 reams of paper, down from 750 reams of paper used in 2003. The following data represent the impact of OEA's paper use:

FY04 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

	Reams	Weight (tons)	Energy (BTUs)	CO_2 emissions (pounds)	Wood use (pounds)
Virgin paper					
30% post-consumer paper	10	0.025	126	16	52.00
100% post-consumer paper	550	1.375	23,109	2,884	9,533

The OEA saved 23,235 BTUs of energy by using recycled paper instead of virgin and avoided 2,900 pounds of carbon dioxide emissions to the air. In addition, OEA saved 52 pounds of wood by using the 10 reams of 30 percent post-consumer recycled paper instead of virgin paper and saved 9,533 pounds of wood by using 550 reams of 100 percent post-consumer recycled content paper instead of purchasing virgin paper. That is a total of almost 9,600 pounds of wood that can remain in the forest as a result of the OEA purchasing decision.

Over 75 percent of the office supplies purchased are reusable, less toxic, or contain recycled content. Examples include Post-It-notes, refillable pens and pencils, file folders, three-ring binders, note pads, etc. OEA staff visit the Resource Recovery Office on a regular basis to obtain reusable office supplies that have been discarded by other agencies. All documents are printed and copied whenever possible on two sides to reduce the amount of paper consumption to half.

Recycled paper is used exclusively in the office, whenever it is available. Letterhead, business cards, 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 MPCA cafeteria supplies compostable dishware. OEA uses washable linens in the kitchen and restrooms and uses environmentally preferable cleaning products (Restore) in the kitchen and in a refillable spray bottle throughout the office.

Pressure-treated wood. Plastic lumber, wood-plastic composite lumber, fiberglass-reinforced plastic lumber, and nylon board products all have the potential of replacing pressure-treated wood products and often do. Minnesota is second only to Ohio regarding the number of plastic lumber manufacturers in the state. In addition, most of these companies use large amounts of post-consumer high-density polyethylene in their product. Minnesota is also home to one of the only companies in the world using old carpet to produce a nylon board product and one of the few companies producing fiberglass-reinforced recycled structural plastic lumber that can be used in marine applications. The OEA continues its efforts to support the market development of plastic lumber, wood-plastic composite lumber, and nylon board products.

Iron Range Resources and Rehabilitation Agency (IRRR) – The Purchasing/Accounting staff also obtains agency office supplies from Central Stores. The agency purchased 1,765 reams (21 percent over FY 2004) of Opaque Repro paper in FY 2005 (which is 30 percent total recovered fiber) for our copiers, printers, and fax machines. To accomplish the task of producing 4.4 tons of paper, 26,403 pounds of wood are needed. Concerning atmospheric emissions, 22,272 pounds net greenhouse gases (CO_2 equivalents) are also produced to create 4.4 tons of 30 percent post-consumer recycled paper.

Resource Recovery furnishes our agency with a box at each work station to deposit recyclable office paper into. Our waste paper, which consists of 6,000 pounds of newsprint and office paper as well as 2,000 pounds of cardboard, is transported to Northern Minnesota Recycling of Virginia for processing. When the procurement staff issues printed literature solicitations, they require bidders to use paper containing at least 10 percent post-consumer material by weight. Printing contractors are required to use soy-based or other agra-based ink.

Metropolitan Airports Commission (MAC) – Paper consumption has increased by 280 reams over 2004 levels. The amount of recycled content paper used, as a percentage of the whole, has not changed from 2004 to 2005.

Paper type	Reams	Energy (BTUs)	Greenhouse gas emissions (CO_2 equivalents in pounds)	Wood use (pounds)
Virgin paper	4,150			
30% post-consumer paper	1,950			
100% post-consumer paper	0			
Total paper	**6,100**	**561,993.73**	**83,547.67**	**95,592.86**

Metropolitan Council Environmental Services (MCES) – In 2004, MCES used 9,891 reams or 24.73 tons of 30 percent recycled content office paper. Using the federal environmental executive web-based paper calculator (http://www.ofee.gov/recycled/calculat.htm), this results in 124,897 pounds of net greenhouse gases and 120,022 pounds of wood. For paper without recycled content, 3,378 reams or 8.44 tons were used in 2004. Using the calculator, this results in 47,937 pounds of net greenhouse gases and 58,517 pounds of wood.

Metropolitan Mosquito Control District (MMCD) – MMCD used approximately 660 reams, or 1.65 tons, of office paper in 2005. This is a slight increase from 2004 when the district used 640 reams of office paper. The average post-consumer content for all the paper used was 30 percent. Using the paper calculator on the Office of the Federal Environmental Executive website, the energy used to make 660 reams of paper was 56,817 BTUs. The net greenhouse gas emissions in CO_2 equivalents was 8,586 pounds, while the wood used to make the paper was 8,251 pounds. The table below compares district office paper usage for 2004 and 2005.

METROPOLITAN MOSQUITO CONTROL DISTRICT OFFICE PAPER USAGE 2004-2005

Reporting period	Quantity used (reams)	Recycled content (%)	Energy used (BTUs)	Greenhouse gases (lbs)	Wood used (lbs)
FY 2004	640	30%	53,475,000	8,081	7,765
FY 2005	660	30%	56,817,000	8,586	8,251

The district is currently reviewing the printing processes used at MMCD in an effort to reduce the amount of paper and printer ink used by district staff. Staff is being encouraged to use voice mail and e-mail more for internal correspondence and to resist the urge to print e-mail messages. We hope that these and other process changes in our printing habits could reduce paper usage substantially in 2006.

Metropolitan State University – Paper consumption for fiscal 2005 totaled 16,190 reams. All paper purchased was 10 percent post-consumer. We do not have fiscal 2004 for a comparison.

Department of Military Affairs – The purchase of MNARNG office paper is not entirely centralized. Each of the 80 facilities makes local purchases of office paper. The exact amount of office paper that was purchased was not able to be determined.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency (MPCA) St. Paul office uses reusable visitor badges—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 MPCA'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 30 percent post-consumer paper for laser printers that cannot accommodate the 100 percent post-consumer paper. The MPCA purchased a total of 9,626 reams of paper in FY 2005, compared to 8,995 reams of paper in FY04, 9,299 reams in FY02, 13, 901 reams in FY00, and 16,985 reams in FY95.

The MPCA makes extra efforts to provide information for internal and external customers electronically to reduce paper consumption, including putting some annual reports on its web page. The MPCA staff calculated the air emissions based on paper use using the provided program. Because the computer program would not save the calculations in electronic form, a printed copy is attached to the MPCA's IPPAT submittal.

Efforts continue to reuse existing supplies, whenever possible. Currently, each floor has a designated storage area for reusable items such as file folders, three-ring binders, and a variety of miscellaneous office accessories. Recently, a team of MPCA staff laid out a plan to create a central MPCA supply center. The creation of the MPCA supply center would support the use of recycled or surplus supplies. Having the supplies in one place would give MPCA staff better control over ordering, allowing for the ordering of environmentally preferable products. It will also be easier to manage inventory, avoid duplication and overstocking. The central supply center will also reduce the total number of shipments of supplies to the MPCA.

The Alliance for Recycling and Reduction of Waste (ARROW), a group of MPCA employees who serve as a point of contract for any recycling (reuse, reduce, or rethink) or composting questions, continues to sponsor pad-making parties with staff who volunteers 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 receives a one-sided paper tablet courtesy of ARROW.

ARROW recently implemented a plan to encourage Environmentally Preferable Purchasing. This initiative focuses on purchasing products that are nontoxic; water based, and has recycled or post-consumer content, and have no odors. Products that meet the criteria are placed on list for all individuals who order office and cleaning supplies to reference when ordering. There are 67 items on the list, includin: Restore Spray and Clean All-Purpose Cleaner, Nature Saver Recycled Paper Clips, Earth Smart Recycled Notebooks, and many more.

The Brainerd office reuses mailing envelopes. It also has a tray in its copier filled with used paper to use for copies that stay in the office.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – ATC utilizes both new and recycled office supplies, including paper with a 50 percent recycled content and 30 percent post-consumer fiber content. Recycled toner cartridges are purchased. Ink and toner cartridges as well as obsolete cell phones are recycled through our local

school district as a fund raiser. ATC maintains paper recycling stations at all printers, copiers, and mailrooms.

Dakota County Technical College (DCTC) – Office supplies are purchased from state contracts and state surplus whenever possible. All paper, cardboard, and toners are recycled.

Hennepin Technical College, Brooklyn Park – We recycle our used toner cartridges and we buy recycled toner cartridges. We also buy recycled paper.

Minnesota State University, Moorhead (MSUM) – Online resources have greatly reduced the amount of office supplies used by MSUM. University e-mail is provided and encouraged to reduce paper for memos, announcements, and correspondence. Many educators have chosen to use online resources for classes including assignment and note postings, exams, syllabi, and announcements. The administration is taking steps toward reducing mass-produced items such as student bulletins, and liberal studies worksheets, billing and financial account information, and registration materials. These items have instead been made available online to all students. Last academic year, MSUM used approximately 24,039 reams (240.39 tons) of office paper. This amount included 22,252 reams of 30 percent post-consumer content paper and 130 reams of 100 percent post-consumer content paper. The associated energy use for the total of all paper used included 1,224,948.66 pounds of greenhouse gasses, and 1,203,211.8 pounds of wood.

Northwest Technical College, Bemidji – Energy Star-rated office equipment and replacement/repair for HVAC equipment is being done.

St. Cloud State University (SCSU) – SCSU extensively uses paper with 50 percent recycled content and 30 percent post-consumer fiber content and has reduced usage by about 5 percent to 47,400 reams from last fiscal year's usage of 124.7 tons (49,900 reams). Office and computer paper is recycled. An exception is most of about 850 reams (comparable to last year's use of 838 reams) of colored paper used in our student union copy shop. Whenever feasible, recycled color paper was used; and all white paper used in that copy shop was standard 30 percent minimum post-consumer content recycled paper included in our bulk campus supply counts. Recycled photocopier toner cartridges are purchased. Ink and toner cartridges are recycled. Using e-mail to post surplus supplies for use in other departments has been very successful about 15 times this past year. Desks, plants, pesticides, produce, chemicals, computers, and cooking oil for bio-diesel were also recycled.

Department of Natural Resources (DNR) – Copy paper, file folders, envelopes, Post-It notes, and cardboard storage boxes are all made with post-consumer recycled content.

North Hennepin Community College (NHCC) – Central Duplicating Services section provides both new and recycled office supplies to all departments on campus.

Department of Transportation (Mn/DOT) – In 2004, Mn/DOT purchased 35,283 reams of 30 percent post-consumer content paper and in 2005, 34,270 reams. Mn/DOT recycles computers, cardboard, paper, and toner, copies on both sides of paper whenever possible. Mn/DOT purchases printer toner with biodegradable inks; the cartridges can be recycled.

University of Minnesota – University Stores sells copy paper to the university departments. The pattern of paper sales and environmental impacts by type for 2002 thru 2004 are presented in Part 3 of this report. The use of recycled content paper decreases energy and wood usage and reduces the greenhouse gas production related to paper production. The decrease in paper sold by University Stores could be due to many factors including the "paperless U" initiative to eliminate paper with electronic records where possible and to the relaxed purchasing policies that include quick and easy credit card purchases by departments directly from stores. The "paperless U" initiative as a resource conservation effort has avoided the use of millions of sheets of paper by the university in recent years.

23. Oil, Oil Filters

Department of Administration (Admin) – The Materials Management Division has established statewide contracts to purchase re-refined motor oil and oil change services, which 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 Materials Management Division has a contract for bulk re-refined motor oil. The division, in conjunction with the Department of Transportation, also has a contract to manage used oil sorbents and filters for processing for energy recovery. 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 Travel Management Division 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.

Department of Corrections (DOC) – *MCF-Rush City* - All of our automotive oil and filters are recycled through the local vendor that services our fleet. Oil from the chillers is recycled through our contracted vendor.

Iron Range Resources and Rehabilitation Agency (IRRR) – The IRRR collects oil and oil filters and then sends them to Como Oil of Duluth for recycling.

Metropolitan Airports Commission (MAC) – The MAC fleet/vehicle maintenance shop is equipped with an oil/fluid change pit that employs a mobile collection tray to catch spent lubricants. The spent lubricants are pumped directly into a large storage tank, eliminating the possibility of spills. 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.

As a service to its tenants, MAC also collects used oil from non-commercial tenants at the reliever airports. Collecting used oil from these tenants reduces the possibility of ground water and soil contamination from the oil being improperly managed. Used oil generated at the Reliever Airports by non-commercial tenants and MAC operations is stored in tanks provided by the MAC. It is collected periodically and re-refined by a permitted vendor.

Metropolitan Council Environmental Services (MCES) – 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 2004, for all facilities, 6,965 gallons of used oil were transported, an increase of 15 percent from the previous year. Approximately 1,137 pounds of used oil filters were recycled, an increase of 15 percent over 2002.

Metropolitan Council Metro Transit – 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 – MMCD uses re-refined oil 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. In the five years that this program has been in place, MMCD has not experienced any problems with the truck fleet related to the extended mileage program. All used oil and used oil filters generated by MMCD are recovered and recycled through a recovery vendor.

Department of Military Affairs – The MNARNG recycled approximately 10,000 gallons of used oil. The DMA generated twenty three 55-gallon containers of crushed used oil filters. The filters are sold as scrap iron.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Oil and oil filters generated on our campus are drained, collected in approved containers, and recycled through licensed recycling contractors.

Dakota County Technical College (DCTC) – DCTC collects oil and oil filters and sends them to Edel oil for recycling.

Hennepin Technical College, Brooklyn Park – At EPC, oil filters are drained, crushed, and then stored in a 30-gallon ring top drum picked up by OSI. The used oil which is stored in a 250-gallon aboveground tank is also picked up by OSI. At BPC the oil filters are drained, crushed, and stored in 30-gallon ring top. They are picked up by Safety Kleen. The waste oil is stored in a 500-gallon underground tank and is also picked up by OSI.

Minnesota State University, Moorhead (MSUM) – All oil and oil filters currently used by MSUM are recycled through an approved vendor.

Northwest Technical College, Bemidji – Oils and filters are recycled.

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.

St. Cloud Technical College (SCTC) – Used oil is collected and recycled; oil filters are drained for 24 hours and recycled.

Department of Natural Resources (DNR) – DNR shops recycle all used oil and used oil filters. Most oil is picked up by a used oil recycler at no cost , but one shop gives their used oil to the local Mn/DOT facility, that has a used oil burning heating plant, to use as a fuel source. Used oil filters are allowed to drain, stored in a barrel, and then picked up by a recycling company.

North Hennepin Community College (NHCC) – The college collects and stores used oil and filters in approved containers and recycles them through a local recycling vendor.

Department of Transportation (Mn/DOT) – Mn/DOT recycles all used oil and oil filters. See section 14, *Energy Production.*

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 (Admin) – The Materials Management Division specifies non-lead paint for traffic marking and equipment paint. The Materials Management Division has added reprocessed and reblended latex paint to the contract for indoor painting. The Materials Management Division worked with the Plant Management Division to expand the use of reprocessed and reblended paint throughout the Capitol Complex.

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

Bemidji State University (BSU) – BSU maintenance procedures continue to use electrostatic painting and low-VOC paints whenever possible. A moratorium on the use of organic solvent-based wood sealers continues. Water-based paints and finishes are used whenever possible.

Department of Corrections (DOC) – *MCF-Rush City* – A contract exists with Onyx Environmental for all hazardous waste disposal.

Metropolitan Airports Commission (MAC) – The MAC Paint Department is responsible for painting/striping many acres of pavement, runways, and taxiways in addition to parking lots and roads. Annually, more than 10,000 gallons of pavement-marking paint is purchased in reusable 250-gallon totes. Once emptied, the totes are returned to the supplier for reuse, eliminating the need to manage hundreds of 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 provides a more even coat of paint. Sandblasting has been replaced by shotblasting with a self-recycling system that filters and reuses the blasting media.

Department of Military Affairs – The MNARNG will be changing from a solvent-based, chemical resistant paint to an aqueous-based, chemical resistant paint. Initial testing by other Department of Defense facilities has demonstrated that reduced amounts of paint waste requiring disposal are produced as well as reducing VOCs released to the environment.

Paint removal: The 133rd Airlift Wing has two sandblast systems. The first is a system that utilizes aluminum oxide blast agents. The second is a plastic bead blast system. The 133rd has received approval from Hennepin County for a management plan to sell the plastic media as feedstock. These two systems have greatly reduced the amount of blast media disposed of as waste.

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

Maintenance staff at the St. Paul office of the MPCA uses only low-VOC paints for internal and external painting projects. In FY 2003, the MPCA remodeled one floor and only low-VOC paints were used.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Low-VOC, lead-free, water-based, and latex-based paints and finishes are purchased and used whenever possible. Licensed contractors are employed to strip and hydro-blast painted surfaces on campus.

Dakota County Technical College (DCTC) – Latex paints are used whenever possible at DCTC by our maintenance department instead of oil-based paint to reduce VOCs.

Mesabi Range Community and Technical College – The college uses water-based (not oil-based) cleaning compounds whenever available.

Metropolitan State University – Our policy is to operate "green" facilities. This is currently accomplished by use of environmentally friendly products (low-VOC paint and citrus degreaser/cleaner).

Minneapolis Community and Technical College (MCTC) –Purchasing low-VOC products, with the lowest potential to contribute to air pollution, is ongoing and will continue in fiscal year 2006. Examples include: Freedom Stripper 100.7 g/L VOC changed to Spartan GreenSolutions Stripper 61.0 g/L VOC, Spartan

Sheen 17 Floor finish 45.0 g/L to Spartan GreenSolutions finish 0g/L VOC and Spartan Extraction II 20.9 g/L to Clean By Peroxy 0 g/L.

Minnesota State University, Moorhead (MSUM) – MSUM has developed a policy to purchase and use only chemicals with low or no VOCs while addressing the issue of indoor air quality and multiple chemical sensitivities. Some of the products that MSUM uses are Glidden's Lifemaster 2000 paint and Buckeye cleaning products. Glidden's Lifemaster 2000 is a no-VOC line of paint and is virtually odorless. The Buckeye products currently used are biodegradable and one, Star Spray, is even Green Seal approved.

Northwest Technical College, Bemidji – We do purchase low-VOC cleaning supplies and use water-based paints, floor sealers, and carpet cleaners.

Riverland Community College, Albert Lea and Austin – A few years ago, we encouraged the Theater and Carpentry Departments to switch to water-based paints and to eliminate the use of petroleum-based products.

St. Cloud State University (SCSU) – SCSU has converted almost all possible paint coatings to water-based products to limit volatile organic compounds (VOCs).

St. Cloud Technical College (SCTC) – The Instructors of our auto body class use lead-free, low-VOC paints in the auto body lab. Latex paints are used by our maintenance department whenever possible.

Department of Natural Resources (DNR) – Uses recycled latex paint in remodeling and new construction.

North Hennepin Community College (NHCC) – 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.

Department of Transportation (Mn/DOT) – Mn/DOT districts are using 110-gallon returnable paint totes instead of 55-gallon single-use drums, which eliminates waste 55-gallon paint drums. Mn/DOT uses lead-free latex or epoxy pavement marking/striping paint. All vehicles purchased by Mn/DOT are specified to have heavy-metal-free coatings/paints. Mn/DOT is planning to use stainless steel dump boxes and sanders to prevent future re-furbishing and sandblasting. See also section 16, *Heavy metals*.

University of Minnesota – The university's *Standards and Procedures for Construction* "recommends and supports" the use of reblended paint and has developed reblended paint specifications (http://www.cppm.umn.edu/standards.html).

25. Parts Cleaning

Department of Administration (Admin) – The Plant Management Division does not use solvent-based parts cleaning solution. The Travel Management Division has an aqueous-based parts cleaner machine that generates no hazardous waste. The Travel Management Division has an OSHA-approved brake cleaning system to handle any possible asbestos contact or contamination.

Iron Range Resources and Rehabilitation Agency (IRRR) – Parts cleaning fluid is temporarily stored on site, then recycled by Como Oil of Duluth.

Metropolitan Airports Commission (MAC) – MAC continues to use recycling parts washers that employ a built-in distillation apparatus that cleans and reuses dirty solvent. The only waste is an oily by-product that tests nonhazardous and is approved for disposal under a used oil profile. Parts washer waste has been reduced from over 400 gallons annually to less than five without increasing costs.

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 (MCES) – There are over two dozen parts washers at MCES facilities and 302 gallons of solvent were recycled in 2004, a decrease of 24 percent from the previous year. The solvent is petroleum-based and is serviced by Safety-Kleen, Inc. or WRR Environmental Services as a hazardous waste largely due to its low flash point.

Department of Military Affairs – The MNARNG purchased parts cleaning machines have greatly reduced the annual generation of solvent waste. These machines have ultra filtration baffle system technology that greatly reduces the need for solvent change out. The MNARNG is also in the process of replacing older aqueous parts washing machines. The pollution prevention assessment will research and recommend appropriate replacement technology.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – The Diesel Mechanic, Marine and Small Engine and Truck Driving programs use a petroleum-based distillate parts cleaning system managed by a licensed contractor. Other programs on campus have converted to orange-based parts cleaning systems. ATC will be implementing recycling parts washers using a distillation filtration process to virtually eliminate hazardous waste generation. This implementation will occur during the next fiscal year and will reduce our generation status from a Small Quantity Generator to a Very Small Quantity Generator.

Central Lakes College, Brainerd and Staples – The programs that have parts washers have switched to a more environmentally friendly product that can be cleaned and recycled.

Dakota County Technical College (DCTC) – Como Lube changes the parts cleaning solution every month.

Hennepin Technical College, Brooklyn Park – We use Como Lube for the parts cleaner.

Minnesota State University, Moorhead (MSUM) – The university uses a citrus-based, environmentally friendly parts washing fluid in the automotive mechanic shop.

Northwest Technical College, Bemidji – Our Automotive and Automotive Machine programs have changed from solvent-based to water-based parts washers. They have purchased and are using an antifreeze recycling machine.

Riverland Community College, Albert Lea and Austin – The programs that have parts washers have switched to a more environmentally friendly product that can be cleaned and recycled.

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.

St. Cloud Technical College (SCTC) – Our Automotive Department has a contract with Safety-Kleen systems to provide and recycle parts cleaners.

Department of Natural Resources (DNR) – Most DNR shops now have parts cleaners that do not use a petroleum-based solvent, but instead use a citric-acid-based solvent. This solvent is recycled through filters internally in the parts washer and the solvent is used over and over. When the filters have become full, they can be disposed of in the garbage. The remaining DNR shop that uses the petroleum-based solvent is looking into converting to the citric-acid-based solvent.

Department of Transportation (Mn/DOT) – Mn/DOT has replaced non-recyclable vehicle parts washers with aqueous-based vehicle parts washers and high flash point 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.

University of Minnesota – The University of Minnesota Studio Arts Department has installed a parts washer system, for paintbrush cleaning, which uses a naphtha-based proprietary solvent that is non-flammable and is perpetually cleaned by a re-circulating 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 eliminates 120 gallons of solvent waste per year. Fleet Services has installed 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 eliminates 240 gallons of solvent waste per year.

University of Minnesota-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

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) –Through an Indoor Air Sensitivity Program, MSUM provides education to users of buildings deemed with having chemically sensitive occupants. This program informs occupants about the potential negative impacts of perfumed soaps, fragrances, air fresheners, residual cigarette smoke, etc.

27. Pesticides, Fertilizers

Department of Administration (Admin) – The Plant Management Division follows pollution prevention practices during the planting and care of landscaping by its Grounds Services staff. The Plant Management Division participates in a Public Land Task Force addressing integrated pest management practices. MMD, in conjunction with the Department of Corrections, has established a Biohazard Waste Cleanup contract.

In conjunction with the Department of Agriculture, the Materials Management Division has a contract for the handling of hazardous materials, pesticide packaging, transportation, and disposal. This contract primarily involves collection of waste pesticides in the rural areas of the state, but it also provides for the transportation and disposal of pesticides from household hazardous waste facilities throughout the state.

The Materials Management Division has undertaken a process change in the area of pest control services by moving to integrated pest management, to achieve long-term, environmentally sound pest suppression and prevention through the use of a wide variety of technological and management practices. The Resource Recovery Office has not needed to use pest control services at the State Recycling Center by ensuring clean facilities that do not attract vermin.

Department of Agriculture (MDA) – The Agronomy /Plant Protection Division's ongoing projects are instrumental in educating rural, suburban, and urban Minnesota in the proper best management practices of pesticide use and disposal.

The Sustainable Agriculture program, now in its 15th 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 be obtained from the MDA's website.

Department of Corrections (DOC) – DOC facilities that use pesticides or fertilizers only apply them at set times throughout the year and only use what is needed for that application.

MCF - St. Cloud – Has instituted an on-site composting process to reduce the amount of waste sent to the landfill.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – ATC uses pesticides only on an as-needed basis and in very limited amounts. A phosphorous-free, organic-based fertilizer is applied by a licensed applicator to ATC green spaces.

Dakota County Technical College (DCTC) – DCTC adheres to all federal, state, and local standards when applying any pesticides and fertilizers while trying to minimize their usage.

Hennepin Technical College, Brooklyn Park – We use Tru-Green Chemlawn.

Minnesota State University, Moorhead (MSUM) – MSUM uses very few pesticides. Products that are used produce residues with a short active residence time in the environment. These products are measured accurately and are diluted according to manufacturers' instructions when in use. At the Regional Science, Center minimal landscaping practices are standard. Minimal mowing and use of very few chemicals helps preserve the natural prairie and wooded areas. Weed control with invasive leafy spurge is being done without the use of pesticides. Instead, MSUM has implemented a control program that uses Aphthona nigriscutis, the Black Dot Leafy Spurge Flea Beetle, to help control leafy spurge. These beetles while adults feed on the foliage, but do not severely harm the plant. The larvae however, live in the root system and feed on the roots, thus killing the plant. So far, after introduction, the beetles are colonizing and results in weed control have been noted. This program not only saves money and labor, but is also extremely environmentally beneficial due to the close proximity to the river.

To help prevent harmful spills and to ensure that any spills are taken care of properly, a new Spill Response Program has been implemented for the Physical Plant in conjunction with the university's storm water program. This deals specifically with pesticides and herbicides, as well as with other spills such as petroleum-based substances. The program included education to staff as well as a centralized location for all spill response supplies.

Northwest Technical College, Bemidji – We use a licensed pest control service (Ecolab). We have not used fertilizers for at least five years.

Riverland Community College, Albert Lea and Austin – In the past two years, the college has gone from four lawn treatments per year to one treatment per year at all four locations.

St. Cloud Technical College (SCTC) – We try to use the minimum levels of pesticides and fertilizers necessary to maintain attractive grounds. Application staff is trained to properly and safely use these products.

St. Cloud State University (SCSU) – At SCSU, we try to use the minimum levels of pesticides and fertilizers necessary to maintain attractive grounds. Application staff is trained to properly and safely use these products and to avoid phosphates. Special emphasis is given to properly mix quantities and to cleanup in the event of an accidental spill. Phosphate use concerns were addressed in MS4 actions and public community concern/outreach meetings.

North Hennepin Community College (NHCC) –

All pesticides for pest and weed control and lawn fertilizers are applied by licensed private contractors.

Department of Transportation (Mn/DOT) –

Mn/DOT has developed specifications on the use of natural-based fertilizers, low-content phosphate fertilizers, and slow release and water insoluble forms of nitrogen. The metro district recommendation includes options for zero chloride-based forms of fertilizer. Several new herbicides have been tested against wild parsnip and Grecian foxglove. Both these plants have the potential to harm employees and the public.

University of Minnesota – The University of Minnesota is a world leader in agriculture research and education that 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), sustainable agriculture (http://www.misa.umn.edu), and precision agriculture (http://precision.agri.umn.edu/index.htm).

The Elwell Agroecology Farm (http://swroc.coafes.umn.edu/eaf.html) is a 160-acre parcel in Lamberton Township that has a 30+ year history of minimal pesticide and fertilizer application, and limited tile drainage. These characteristics present researchers with unique opportunities for developing cropping systems studies, as well as studies on fertility, water quality, low input and organic input, management and tile drainage—all in close proximity to the University of Minnesota's Southwest Research and Outreach Center.

Agroecology is the study of relationships between organisms (including humans) and their environment, involving landscapes that are defined by a significant presence of agricultural activity. The main distinctions of agroecosystems, compared to natural ecosystems, are deliberate human intervention to modify the spatial and temporal species composition, altered energy and resource dynamics, and greater levels of disturbance. Agricultural ecosystems are defined by environmental, biological, and sociological factors and can be described using properties such as productivity, stability, sustainability, and equity.

The management of the Elwell Agroecology Farm (EAF), will emphasize a team-based planning process that includes researchers, farmers, SWROC staff, extension faculty, and others interested in agriculture. Research and education activities will foster an environment that respects and rewards individuals and teams, and enhances the communities in which people live. Efforts will be made to develop an ongoing research and educational environment that has opportunities for people with diverse interests to participate. Current and future research projects conducted on the EAF emphasize the development of cropping systems that efficiently cycle water, nutrients, and energy, while at the same time enhancing profitability. Multi-disciplinary approaches to research and educational activities will be encouraged, and projects will be designed to further our understanding of systems properties and processes.

Current studies at EAF include:

- There are two ongoing, long-term cropping systems research studies on the EAF. The Variable Input Crop Management Systems (VICMS) study was established in 1989 to evaluate the productivity and profitability of a corn-soybean rotation, as well as a corn-soybean-oat-alfalfa rotation under different management systems including high purchased chemical inputs, low purchased chemical inputs, organic inputs, and minimum inputs. Native prairie strips were also established in conjunction with the minimum input plots in order to compare changes in soil conditions in the other management systems with these two conditions. A companion study, located on the SWROC, evaluates the same systems but from an initially high fertility status.
- The Organic Rotation Plots (ORP) were established in 1990 to study the effect of both fertility and crop rotation on corn production under organic management. Composted turkey manure is used to supply nutrients, and weeds are controlled mechanically. The four crop rotations evaluated are continuous corn, corn-soybean, corn-soybean-oats, and corn-soybean-oats/alfalfa-alfalfa. Unfertilized companion plots are maintained in order to allow comparisons of crop yields and soil conditions resulting from both the manure applications as well as the different crop rotations.
- In 1994, a study was established in a poorly drained soil on the eastern portion of the EAF to evaluate the quantity and quality of water entering surface tile inlets and subsurface tile drains. Sediment, nitrogen, and phosphorus contents are monitored in tile drained water from treatments that compare moldboard plowing vs. ridge-tilling, and synthetic vs. organic forms of fertilizer. The information gained from this study will aid our understanding of surface and subsurface tile drainage effects on crop production and water quality in the Minnesota River watershed. Approximately one-third of the EAF acreage is not currently in research plots. This acreage is being preserved under previous minimal input management for future research.

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 the area of safe and environment-friendly use of pesticides and fertilizers and other sustainable agriculture practices.

The university's Precision Agriculture Center (http://precision.agri.umn.edu/index.htm) in St. Paul was the first of its kind when it was founded in 1995. The new agriculture was born in Minnesota more than 20 years ago when Control Data and other companies began developing the technology. In 1993, tech-savvy farmers in the Red River Valley were among the first to use what's called precision agriculture. The goal of precision agriculture is to help farmers gain more value per acre while leaving a lighter footprint on the earth.

> *A combine rolled over a dying patch of Canada thistle, the purple-flowered weed that farmers fight. Reaching to his right, the farmer tapped a button on a small computer linking him to the global positioning system. That tap recorded the precise location of the thistle patch in his Red River Valley navy bean field. Next spring, he'll use that information when his computer-generated maps guide him in spraying herbicide. For six years, the farmer has been using GPS to map patterns of crabgrass, wild oats, or the fast-spreading thistle. That's just one of the ways this Minnesota farmer is using technology to increase profits while reducing chemicals that can leach into the environment.*

Scientists at the University of Minnesota are at the forefront of a new era in farming that is changing the way the world grows food. For centuries, farmers used a pinch of soil, a keen eye, and their memory of the land. Today's farmers are turning to lasers, digital technology, and satellite images to better manage crops. A growing number of farmers are treating yards of earth individually to grow healthier plants, rather than using the traditional one-size-fits-all approach to their fields. Better management of information is helping farmers decide on the best possible use of their land as well as on seed varieties, drainage, fertilizer, fungicides, and insect control. There's no quick payback for much of this technology, which requires a few seasons before the farmer builds a reliable base of information. And for some farmers, it wouldn't pay. If, for example, a field is fairly uniform with no variability in nutrient conditions, there's no need to vary rates of fertilizer application. But for Red River Valley farmer, Gary Wagner, the high-tech field practices are paying off big time. He figures that in two recent years, he applied $54,000 less in pesticide on 6,000 acres that he and his two brothers farm. The farm saves money and less pesticide is released to the environment.

28. Policy Statement

Department of Agriculture (MDA) – 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. We are committed to lead by example through the reduction of energy use, the use of toxic pollutants, and the generation of hazardous waste in our own department.

Department of Corrections (DOC) – DOC-wide policy exists. See *Part 2 Policy and Regulatory Activities* above.

Office of Environmental Assistance (OEA) – Pollution prevention means eliminating or reducing pollution at its source. This includes utilizing raw materials and other resources more efficiently, substituting benign substances for hazardous ones, and producing products without toxic constituents. Pollution prevention helps to protect human health, strengthen our economy, and preserve our 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. We believe that pollution prevention in our workplace will lead to healthier and more efficient employees, save of public funds, and introduce less waste 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 are 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 (MAC) – The Metropolitan Airports Commission recognizes pollution prevention as an integral part of its services and understands this requires the cooperative efforts of both its staff and tenants. The MAC, through its strategic plan, has committed itself to providing excellence and leadership in the protection of the environment. The MAC accomplishes this by establishing environmentally friendly strategies that lessen adverse environmental impacts on the natural environment and the surrounding communities, while encouraging our tenants to do the same. The MAC also promotes a proactive approach to environmental protection and supports cooperation with other regulatory agencies. (See also Part 2 *Policy/Regulatory Activities*.)

Metropolitan Council Environmental Services (MCES) – Section 1-2a, *Environmental Sustainability*, of the Metropolitan Council's Administrative Policies and Procedures contains a subsection with policies that are consistent with the Governor's Executive Order 99-4.

Department of Military Affairs – The MNARNG is committed to the ISO 14001 standard of Environmental Management System. In accordance with ISO 14001 standards, the MNARNG is committed to integrate innovative environmental solutions into processes and systems so that they become "a way of life" in order to prevent pollution, achieve or exceed regulatory compliance, minimize procedural burdens, reduce costs, conserve resources, enhance safety, foster community support, and increase time available for the soldier's mission.

Minnesota Pollution Control Agency (MPCA) – The Minnesota Pollution Control Agency's Commissioner Corrigan noted in all staff e-mail dated November 1, 2005 that:

"One of the drivers for creating our new PCA was to more effectively integrate pollution prevention into our work. For the past seven months, a team…has been characterizing why pollution prevention has not been more systematically integrated…One of the key recommendations from the study was that leadership—at all levels—must actively advance the development and implementation of pollution prevention goals and objectives. In response to this, our new strategic plan will show a clearer commitment to pollution prevention through new mission, vision, values, goals and objectives…The characterization study also recommended better use of pollution prevention technical support and better measurement of pollution prevention results. Our Technology, Education, and Assistance Division…and our Environmental Outcomes Division… will be

working in the coming weeks on strategies focused on technical support and measurement. In addition, our Regional Environmental Management Division is ready to roll-out a water protection strategy designed to prevent the kind of water impairments we are dealing with today."

Goals L.1. and L.2. of the current MPCA Strategic Plan reflect those priorities:

"Reduce or eliminate the use of environmentally harmful substances in manufacturing products or delivering services" (Goal L.1.); and

"Conserve resources and prevent land pollution that reduces options for desired land use" (Goal L.2.).

In addition, the MPCA goal tree in the strategic plan notes that it is an MPCA goal to "Conserve resources and prevent land pollution." Listed as objectives under that goal are:

> "By 12/31/09, 500 tons of lead per year removed from disposal system; Waste growth does not exceed population growth by 2006. 43% recycling and 27% organics or waste to energy rates by 12/31/06. 50% recycling and 35% WTE/organics rates by 12/31/10."

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Alexandria Technical College employs a continuous improvement process that promotes excellence in environmental management and stewardship towards energy efficiency by using the implementation of environmentally friendly and energy-efficient products and waste stream reduction programs both internally and with our vendor partners.

Dakota County Technical College (DCTC) – Dakota County Technical College is committed to excellence and leadership in protecting the environment. In keeping with the policy, our objective is to reduce our energy consumption, and to promote clean air landscaping. By successfully preventing pollution and conserving energy at its source, we can achieve cost savings, increase operational efficiencies, and improve the environment. Dakota County Technical College's environmental guidelines include the following: Environmental protection is everyone's responsibility. It is valued and displays commitment to DCTC. We will continue to pursue energy conservation and efficiency improvements in our operations, and promote conservation practices and investments in energy-efficient technologies. DCTC will encourage clean air landscaping and strive to reduce the amount of turf that requires mowing, and replace current mowers with the most fuel-efficient mowers available. DCTC seeks to demonstrate its corporative citizenship by adhering to environmental regulations. We promote cooperation and coordination between higher education, government, and industry, toward the shared goal of reducing waste at its source and recycling in an environmentally sound manner.

Minnesota State University, Moorhead (MSUM) – The Department of Environmental Health and Safety at MSUM is a strong advocate for protecting the environment. Pollution prevention is a component of our effort to deliver a safe work environment. Successful pollution prevention activities rely on the cooperation and participation of the campus community to ensure a safe and healthy workplace. The EHandS Department is committed to the preservation, protection, and where possible, the enhancement of our environment in all matters of operation. This includes the goals of meeting and exceeding all applicable local, state, and federal requirements, as well as fostering responsible stewardship of all natural resources by personnel in the work place and in the community. We promote a proactive policy in environmental matters; one that anticipates and addresses problems before they become regulatory matters.

Northland Community and Technical College – For fiscal year 2006 and beyond, we will continue to implement and practice strategies for energy savings and pollution prevention. We will develop college policies that will encourage/support the college's and the state's efforts for energy efficiency and pollution prevention. We will further expand the college's recycling efforts on all campuses. We will continue to purchase E85 fueled vehicles as we replace or add vehicles in our fleet.

St. Cloud State University (SCSU) – "The leadership of St. Cloud State University recognizes the strong environmental impact it has and is therefore committed to developing the means to reduce its use of toxic materials, release of toxic pollutants, and generation of hazardous wastes. The university strives to reduce, and, where possible, eliminate toxic materials, damage, and waste, while realizing that there are limits to

its ability to move toward that goal. Maximum results will be achieved through the education of its employees and clientele, continued investigation and implementation of environmentally friendly substitute products, and dedication to its recycling program."

St. Cloud Technical College (SCTC) – St. Cloud Technical College endeavors to comply in every way with all local, state, and federal environmental regulations. SCTC recycles and reuses products whenever possible to help prevent pollution of the environment.

North Hennepin Community College (NHCC) – 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 (Mn/DOT) – See Part 2: *Policy and Regulatory Activities*.

University of Minnesota – The University's Regents approved a new Board of Regents Policy: *Sustainability and Energy Efficiency*, which broadens the scope of existing policy to include positioning the institution as a leader in campus sustainability through teaching, research, outreach, and operations. The policy requires that the administration develop sustainability objectives and performance measures in the areas of physical planning and development, operations, transportation, purchasing, and waste management and abatement; develop appropriate indicators and measures of success; and report annually to the board.

The policy directs the administration to operate within the principles of balancing financial resources and constraints while trying to be good stewards of the environment and a model for society. The policy will supersede Board of Regents Policy: *Pollution Prevention and Waste Abatement*. A Sustainability and Energy Conservation Policy Work Group (SEC Work Group), appointed by the president, was charged with developing a policy framework that would translate into long-term, systematic strategies for integrating sustainability practices and energy conservation across research, teaching, operations, and outreach. The SEC Work Group consulted with university, state of Minnesota, national and international institutions on sustainability policies in place, reviewed past and present sustainability efforts, and developed policy goals and a timeline for implementation. See Part 2 for text of *Board of Regents Policy: Sustainability and Energy Efficiency*.

29. Printing

Department of Administration (Admin) – 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 solicitation, the vendor 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 that outlines federal, state, and local environmental regulations affecting printers in Minnesota.

MMD requires soy-based or other agra-based inks as the standard on all printing orders or contracts. Resource Recovery Office promotes the use of environmental standards such as those used by print shops that are designated Great Printers.

Department of Commerce – Printer and copy paper used by the department contains 30 percent post-consumer content by fiber weight. In FY 2004 and FY 2005, the department used about 14,471 reams of paper. See also section 22, *Office Supplies*.

Office of Environmental Assistance (OEA) – The OEA uses a number of strategies to reduce waste and pollution from printing.

- **More online, less in print:** Increasingly, OEA uses smaller, less-detailed printed pieces and limits the number of copies printed, directing audiences to websites for pdfs for download. For example, OEA produces a printed postcard about green building resources that points readers to the OEA's Green Building web pages for detailed and up-to-date information.
- **Direct-to-plate:** Although limited by the state's purchasing rules, the OEA tries to send offset print jobs to printers that use direct-to-plate technology (sometimes called computer-to-plate). This process allows printer to eliminate all film and chemicals associated with a traditional film process. Unfortunately, most of the state's targeted vendors do not offer this technology.
- **We specify vegetable-based ink** on print jobs (though most printers now use it by default).
- **Short-run laser printing:** OEA does many of its short-run print jobs (less than 1,500 double-sided 8.5 x 11 or equivalent) in house on a high-speed color laser printer. This saves OEA money, and it reduces waste associated with sending jobs to a film-based offset printer (film, developing chemicals, ink, and cleaners/solvents). Using a laser printer to print jobs on stock sizes (8.5 x 11, 11 x 17) eliminates paper waste from trimming, which is usually a required part of an offset job. Doing smaller runs on an as-needed basis also allows for revisions to be made between runs.
- **Recycled consumables:** Most of the consumables (toner cartridges, imaging units, etc.) that OEA's Xerox color laser printer uses are recycled through the Xerox Green World Alliance program. Via a website, pre-paid shipping labels can be printed and applied directly to the original boxes for shipment to a Xerox recycling facility.
- **Better paper:** For print jobs, OEA uses a couple different papers. One is Badger Envirographic 100, a 100 percent post-consumer and process-chlorine-free stock. Another is Mohawk brand papers, with recycled content in the 30 to 100 percent range. The lines of Mohawk that OEA uses are also process-chlorine-free. In addition, Mohawk Options 100 percent PC, which is used frequently, is FSC certified (it has FSC's SmartWood certification).
- **The OEA does a lot of informational displays and signage** for events, and wherever possible we avoid vinyl, use recyclable materials, such as paper or Tyvek®, and use display materials and structures that can be repurposed for future uses.

Iron Range Resources and Rehabilitation Agency (IRRR) – Printing contractors are required to use soy-based or other agra-based ink.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's support staff prints business cards on color printers or standard laser printers with black ink. In the past, the MPCA bought a box of 500 cards from the state contract vendor each time a staff person changed their position or job title. This new option reduces the use of paper and saves the MPCA a significant amount of money. Since 1995, the MPCA has reduced its paper consumption by nearly 50 percent. The MPCA has continued to lease, using a State of Minnesota contract. The MPCA's Canon photocopiers continue to be serviceable. Since the Canon machines have been networked to the PCs of staff, savings have resulted from lower overage charges and 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.

A single MPCA allotment number was established for purchasing toner cartridges for fax and laser printers. 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. The vendor provides toner cartridges for the leased photocopiers.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Our Reprographics Department participates in the Xerox Green Alliance Program to recycle used toner cartridges. Where possible, recycled paper products are used for copying and printing documents. Near each printing and copying station is a recycling center for spent paper products. Cardboard boxes are collected, broken down, and recycled through our local recycling center.

Dakota County Technical College (DCTC) – DCTC has upgraded all machinery and components to the most environmentally responsible available. We encourage two-sided copying whenever possible.

Minnesota State University, Moorhead (MSUM) – Campus Printing Services has moved to using vegetable-based inks and is using paper products containing a high percentage of recycled material. Press/roller washes and fountain solutions that are water-based and low in VOCs are currently used. Printing Services is also using a safer plating chemistry and recycles their aluminum plates, litho film, and reclaimed silver. The student newspaper, which is printed off-campus, also uses soy inks and is printed on 20 percent post-consumer paper.

St. Cloud State University (SCSU) – SCSU exceeds all requirements for use of soy-based inks in materials that are printed either in its campus print shop or those which are processed by a private company. Plastic film is recycled for silver recovery. Recycled paper products are used in the majority of all printing requests. SCSU Printing Services also recycles books, directories, and newsprint.

Department of Natural Resources (DNR) – DNR uses post-consumer or chlorine-free paper and vegetable-based inks. Copiers are purchased that have duplexing capabilities (can reduce paper use by up to 40 percent), energy conservation, digital (direct link from computer), can use up to 100 percent post-consumer paper. Laser printers have duplexing capabilities, energy conservation mode, and can use post-consumer paper. Cartridges can be recycled and recharged.

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

Department of Transportation (Mn/DOT) – The Mn/DOT sign shop is using lead-free ink and nonhazardous screen wash. The sign shop also uses recycled signs.

University of Minnesota – Printing Services is a member of Minnesota Waste Wise. Printing Services recycles, reclaims, and reuses production materials throughout the printing process. Two initiatives have made Printing Services a greener operation. A direct-to-plate process was installed in spring 2001. It eliminates film and all the chemicals involved in the developing process. They continue to use some film, but where they formerly used up to 24 rolls a month they will now use one roll.

On-demand printing is an initiative that allows and encourages departments to have materials scanned and stored electronically. Materials are then printed as needed. This process eliminates waste, saves money, and allows for flexibility in updating materials frequently. Several university departments, including the University of Minnesota Extension Service and Distance Learning, use this process. The following initiatives have made Printing Services more environmentally responsible:

- Installed an X Rite silver recovery machine that recovers silver from photo fixer. The department recovers 28 pounds of silver annually.
- Installed a Devek system that allows recycling and reuse of developer in their film processing. The developer can be used four times instead of once as in the past.
- Migrated some presswork to Xerox machines. Use of toner process eliminates ink and press-wash wastes.

- Metal press plates are collected and sold for scrap.
- Wood pallets are sent back to paper companies for reuse.
- Paper and cardboard are collected and recycled throughout operations.
- Recycled paper options and soy inks are made available to customers.

The university continues to replace its administrative paper systems with electronic reports, forms, and communications. Several million sheets of paper have been saved so far through these efforts.

30. Procurement

Department of Administration (Admin) – The Materials Management Division (MMD) has undertaken a comprehensive effort to increase purchases of environmentally responsible products without resorting to mandates. A key strategy was development of a close working partnership with the Office of Environmental Assistance (OEA). Our goal was to increase awareness of the need for environmentally preferable purchasing throughout state government and to educate purchasers to make green procurement a smart and easy choice from a "best value" perspective.

The Materials Management Division has been proactive in its efforts to identify and obtain environmentally preferable goods and services that result in less waste, less pollution, and that operate more energy efficiently, reducing the demand on other pollution producing sources. The division has numerous contracts to encourage sustainability in state government 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, and waste paper sales.

The Materials Management Division continues to require state purchasers to code each purchase order line with the environmental code. MMD with the Environmentally Responsible Work Group developed environmental definitions to code all items on purchase orders and contracts. This is a required field, which will allow MMD to more effectively track environmental purchases made by the state and can be used to generate reports that capture the types of environmental purchases made. The MMD contract solicitation documents require responding vendors to code the goods and service offered with the state's environmental codes. The codes are required when the state's buyer completes an order in MAPS. MMD has modified the contract release document used to announce state contracts to agencies and CPV members. The contract release now shows the environmental code for each item.

All Materials Management Division bid documents now require vendors to indicate whether their products contain mercury. This information will allow us to work with customer agencies and ascertain whether future specifications should require mercury-free products or award preferences based on mercury content. Any mercury content can then be shown on the contract release document, allowing the buyer to choose the most environmentally friendly product.

Through the information gained from the requirement for environmental codes, the Materials Management Division is gaining valuable information on the marketplace. This information can be used to structure future specifications so contracts will have goods and services that are more environmentally preferable. The Materials Management Division has developed environmentally preferable goods and services contracts estimated in excess of $145 million per year. The list of contracts can be viewed at http://www.mmd.admin.state.mn.us/pdf/environ.pdf. MMD works continually with state agencies and outside environmental groups to discover mutually satisfactory solutions to increase environmentally responsible purchasing. Our newest strategy is to allow agencies, vendors, and environmental advocates to review statewide contracts and make recommendations on more environmentally responsible products or services to be added or substituted. Contracts up for rebid or extension are publicized online to encourage input.

MMD has proactively developed statewide contracts in concert with a knowledgeable user committee to perform environmental services— including hazardous waste recycling and disposal—for the state and other governmental agencies. The committee has, for example, assisted with audits of end sites and transporters to reduce potential superfund liability. Last year, we developed a contract for the hazardous waste recycling of

excess computers and electronic equipment. Meanwhile, we are also analyzing options that would place a greater responsibility for take-back and recycling on the manufacturers.

MMD also recently developed a more flexible approach to an existing legislative mandate. State statutes allow a price preference of up to 10 percent for goods containing recycled content. In most solicitations, MMD awards a one percent preference for each 10 percent of recycled content documented by the manufacturer. For example, a product containing 40 percent recycled content receives a four percent bid preference over a product with no recycled content. The Resource Recovery Office provides technical assistance regarding environmental purchasing.

Automobiles. The Materials Management Division purchases vehicles manufactured without mercury. The solicitations require the vendor to specify if there is mercury in the vehicle, and all responses received in FY 2004 have been checked that no mercury is present in the vehicles.

Carpet and vinyl flooring. 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 agency locations.

Furniture. The Materials Management Division developed furniture contracts featuring only those items having a longer useful life. Increasing the life cycle of items reduces solid waste. The Materials Management Division developed new specifications for the seating contract that requires contract vendors to offer fabric made from recycled product. The division has contracts for remanufactured Herman Miller and Steelcase system furniture that allow state agencies and Cooperative Purchasing Venture members to purchase refurbished products rather than new product. This allows the reuse of furniture parts. This contract requires remanufacture to meet BPIA standards for office furniture recycling (February 1994) and allows trade-ins of Herman Miller and Steelcase system products. The Materials Management Division has created contracts with MINNCOR for furniture refinishing, reupholstery, and refurnishing. This contract is available to all state agencies and CPV members. Materials can be dropped off at Asset Recovery, or Asset Recovery can pick up the materials from customers.

The Materials Management Division's systems furniture contract with MINNCOR also has refurbished furniture. The Materials Management Division has established contracts to clean and repair existing furniture, allowing items to stay in service longer. In addition, the cleaning products used are environmentally friendly. The Materials Management Division, through the Furniture Users Group, acts as a clearinghouse for systems furniture, notifying members of the availability of used systems furniture that other agencies may need for used systems furniture. This facilitation leads to increased reuse of on-hand furniture, reducing waste. The Materials Management Division has specified in the General and Ergonomic furniture seating contract for the products on contract to be recyclable, for the vendor to accept product stewardship, and that the products are able to be remanufactured.

Department of Agriculture (MDA) – MDA uses 20-liter nowpack containers for methylene chloride within the laboratory, which has helped in the reduction of glass waste and the release of hazardous fumes into the laboratory. Energy-efficient Energy Star office equipment is purchased/leased when available. For more information see item d, *Reduce state energy use through purchasing energy-efficient office equipment and appliances* in Part 3.

When available, CFC-free laboratory freezers/refrigerators are purchased by the Laboratory Services Division. 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 place in local landfills.

Bemidji State University (BSU) – BSU continues to support and encourage campus departments to incorporate waste reduction and pollution prevention into their daily operations. The Purchasing Office holds office supply vendor fairs for university departments each year. The events provide an opportunity to make contacts and establish relationships with office supply vendors. Vendors who specialize in remanufactured toner cartridges are invited, and several departments on campus use their products. All used toner cartridges

are either returned to the vendor or picked up by a vendor who remanufactures toner cartridges. In addition, 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.

Department of Corrections (DOC) – All DOC facilities follow Minnesota Statutes §§ 16B.121 and 16B.122, along with Minnesota Executive Order 99-4 requirements via their purchasing departments.

Department of Employee Relation (DOER) – DOER supports and follows all environmentally friendly procurement policies by purchasing/leasing Energy Star-compliant office equipment and office paper that is at least 30 percent post-consumer use. DOER will continue to follow all environmentally friendly procurement policies established by the state.

Department of Employment and Economic Development (DEED) – As referenced in Part 2 of this report, employees involved with purchasing of office equipment were encouraged through policy changes to select energy-efficient, Energy Star-rated items.

Office of Environmental Assistance (OEA) – OEA's outreach efforts include:

- The OEA provided financial assistance to all SWMCB counties to host EPP Workshops in each county over the next year.
- The OEA hosts the Governments for Responsible EPP and Environmental Networking Group (GREEN Group) to increase metro-wide EPP as a region.
- The OEA continues to advocate environmentally preferable industrial and institutional cleaners available off of state contract.
- The Environmentally Preferable Purchasing Guide is online at www.swmcb.org/EPPG/. The EPPG provides information to public entities on environmentally preferable products and how they can be purchased.
- The OEA attended procurement workshops/conferences throughout the year to promote green purchasing at the state and local level.

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 have 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 have native landscaping that requires less water and pesticide application

The OEA's expanded procurement focus continues to include products and services that have a lesser or reduced impact on human health and the environment, such as toxicity reduction, durability, recylability, energy efficiency, etc. This is referred to as environmentally preferable purchasing (EPP). The OEA is working with the Department of Administration to promote environmental purchases and building practices in state-leased buildings by incorporating better specifications into state contracts.

- The OEA has worked with the Department of Administration to incorporate compostable food service items and bags onto state contract.
- The Stakeholder Work Group standards for cleaners have been incorporated into the state contract for cleaning supplies and floor care products. OEA continues to advocate for the purchase of these items.
- The state contract for flooring includes several environmental specifications. The most recent solicitation set higher air quality standards for carpet; increased the use of related glues and adhesives with lower toxicity; 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 Office Supply Connection catalog.

- Continues to advocate for increased recycled content office supplies available through Office Supply Connection.
- A mercury component disclosure and phase-out requirements in the 2002 motor vehicle request for bids (RFB), in partnership with MPCA and INFORM, Inc. The RFB, issued in October 2001, includes a disclosure requirement and statement of intent to purchase only mercury-free vehicles through 2004.

The OEA promotes environmentally preferable contracts to state agencies and local political subdivisions. The OEA has made procurement information available via its website 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. 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 working with architects to encourage the use of resource-efficient materials and practices in new state buildings under construction. Minnesota loses 27,000 acres of farm, forest, and open space land every year to new development. In the United States, we generate an estimated 2.8 pounds of building-related construction and demolition debris per person per day. Globally, building construction consumes 25 percent of virgin wood used each year. Therefore, the OEA has focused on establishing a "green building" program in Minnesota to reduce the loss of Minnesota's natural and reusable resources.

Green building design, construction, and deconstruction can have a substantial impact on removing reusable, recyclable, and toxic materials from the construction and demolition waste stream. Green building practices also achieve reduced greenhouse gas emissions, resource and energy conservation, market development of recycled-content products, and an overall more sustainable approach to our structures and their operations. To help communities find creative environmental solutions that are economically viable and meet social needs, the OEA has created a wealth of Minnesota-specific information to guide green building efforts.

The OEA defines a green building as one that is healthy and comfortable for its occupants and is economical to operate. It conserves resources (including energy, water, raw materials, and land) and minimizes the generation of toxic materials and waste in its design, construction, landscaping, and operation. A green building also considers historic preservation and access to public infrastructure systems, as well as the entire life cycle of the building and its components.

In 2003 the OEA and MPCA signed a 10-year lease that incorporates the new S*tate of Minnesota Sustainable Building* Guidelines and many specific sustainable remodeling, maintenance, and operations practices. It contains the requirement for a commercial energy audit of the building and the implementation of cost-effective recommendations derived from the audit. OEA contributed to development and implementation of the Sustainable Building Guidelines which are mandatory beginning with the 2004 bonding cycle.

The OEA continues to help to promote environmentally preferable chemicals via the Internet. The website address for the Carbohydrate Economy Clearinghouse is http://www.carbohydrateeconomy.org.

OEA's website has been expanded to include information to help local purchasers buy recycled products, and 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.

Iron Range Resources and Rehabilitation Agency (IRRR) – Purchasing/Accounting staff obtains agency office supplies from Central Stores.

Metropolitan Airports Commission (MAC) – Environmental implications are considered when procuring goods and materials for the airports. MSDSs are reviewed and durability, reusability, and disposal costs, etc. are evaluated in addition to following policies and procedures. (See Part 2: *Policy and Regulatory Activities.*)

Department of Military Affairs – The 133rd Airlift Wing and the 148th Fighter Wing in Duluth have established a "pharmacy" for material purchases. Only material from an approved product list can be purchased. Inspections of storage lockers are conducted to ensure that personnel are purchasing only approved

products. Items are distributed in the amount needed to do the job, and unused material can be redistributed when a need is expressed.

The DMA is investigating ways to best implement a similar system with the rest of the MNARNG. The formation of a Hazardous Materials Control Committee will address how best to implement this within the organization. The DMA recycled approximately 52,000 pounds of used textiles, such as old uniforms.

Minnesota Pollution Control Agency – During the past year, the Minnesota Pollution Control Agency has taken steps to reduce emissions and improve the environmental performance of its fleet of 128 vehicles. Currently, the MPCA has 64 flex fuel vehicles and three hybrid vehicles. The MPCA has established 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.

The St. Paul office procured these pollution prevention measures in construction work on its building and grounds as requirements of the lease in 2004 and 2005: a contractor replaced a defunct wooden staircase with a poured large concrete staircase made with coal fly ash amended concrete. The ash content is between 15 to 20 percnet; in August of 2005, the roof was replaced with one made of vinyl rather than a built-up asphalt roof; elevator floors were replaced with Norament rubber which meets indoor air quality standards; rather than replacing elevator walls, the walls were relaminated and restrooms have received new sinks with low flow faucets and the vanities made of Cambria, an artificial stone.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Alexandria Technical College employs a continuous improvement process that promotes excellence in environmental management and stewardship towards energy efficiency when purchasing products. ATC strives to locate suitable environmentally friendly and energy-efficient products both for use internally and also for use by our contractor partners.

Dakota County Technical College (DCTC) – DCTC purchases from state-approved environmentally committed contractors whenever possible.

Minnesota State Community and Technical College, Fergus Falls Campus – By culture and practice the college's procurement processes have long considered efficiency and pollution sensitivity.

Minnesota State University, Moorhead (MSUM) – As a state agency, MSUM has a procurement department in conjunction with the state of Minnesota Materials Management Division. We also utilize Central Stores, which is an expansion of state surplus services. The Physical Plant has centralized all of its chemicals and supplies. This has created less volume in storage and enables university staff to use improved products that are constantly coming onto the market. University personnel have been educated about purchasing materials that are highly environmentally compatible. Pollution risk and hazardous waste disposal costs are emphasized. All departments have also been encouraged to purchase on a as-needed only basis to reduce stock and storage time.

St. Cloud State University (SCSU) – SCSU uses toilet paper and towels of 100 percent total recycled fiber content and up to 20 percent post-consumer fiber content. Some carpet fibers are recycled.

Department of Natural Resources (DNR) – We purchase plastic signs that are made out of post-consumer plastic which can be recycled. DNR purchases carpet that is manufactured with recycled plastic and rubber and purchases plastic lumber for park benches, picnic tables, parking curbs, retaining wall timbers, and decking.

North Hennepin Community College (NHCC) – A variety of aspects are considered when making purchasing decisions here on campus: 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 requirements.

Department of Transportation (Mn/DOT) – Mn/DOT is continually in the process of eliminating and/or reducing waste streams and finding new products and technologies that reduce toxicity and conserve the environment. Mn/DOT uses purchasing preferences for recycled content.

University of Minnesota – The University of Minnesota Facilities Management has developed revised construction standards, which include Sustainable Design Requirements and other concepts from the Minnesota Sustainable Design Guide (http://www.develop.csbr.umn.edu/msdg2/). The university's current Standards and Procedures for Construction address energy conservation elements:

- **Design objectives**
  a. 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.
  b. The architect/engineer 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.
  c. 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.
  d. 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 ensure 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 architect/engineer 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 Center for Sustainable Building Research is developing sustainable building guidelines for the state of Minnesota that will be used on all new state buildings. The guidelines are a part of the Buildings, Benchmarks and Beyond (B3) Project that also includes project management led by LHB Engineers and Architects, Public Building Benchmarking led by the Weidt Group, and project delivery process led by the Adams Group. The guide that results from the B3 project will eventually replace the existing Minnesota Sustainable Design Guide. (www.csbr.umn.edu/B3/). The purpose of sustainable building guidelines is to encourage environmentally responsible design practices by rating facility performance in areas like energy efficiency, indoor air quality, and waste management.

The system provides strategies that are organized according to six environmental topics: site, water, energy, indoor air quality, human factors, materials, and waste. The strategies are phrased to achieve a specific design solution or practice, such as "Use recycled content in 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. Within each strategy are series of actions organized by design phases and a performance indicator for scoring (http://www.sustainabledesignguide.umn.edu).

31. Remanufactured Parts

Department of Administration (Admin) – 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.

The Materials Management Division specifies remanufactured automotive products. The Materials Management Division has developed contracts for remanufactured automotive products for state agencies, which include diesel engines, transmission, alternators, and starters. The Travel Management Division uses remanufactured parts for vehicle repair whenever they are available.

Bemidji State University (BSU) – The maintenance and purchasing departments are continuing to work together to limit the need to purchase new electric motors and plumbing and steam valves by having worn and defective units reconditioned or rebuilt for reuse.

Metropolitan Airports Commission (MAC) – 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.

Department of Military Affairs – DMA uses remanufactured parts in the maintenance of vehicles at their facilities. Whenever possible, these parts are incorporated into the purchasing process.

Minnesota Pollution Control Agency – A single allotment number was established for purchasing toner cartridges for fax and laser printers. 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. The vendor provides toner cartridges for the leased photocopiers. The Brainerd office also uses remanufactured toner cartridges for its printers.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – The purchase and use of refurbished office furniture is encouraged. ATC coordinates office furniture purchases through a contractor that offers this type of office furniture. Remanufactured parts are routinely used for the maintenance and repair of non-leased vehicles and equipment. Using cost effective remanufactured parts prolongs the life of these units.

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

Minnesota State University, Moorhead (MSUM) – MSUM currently uses remanufactured printer cartridges and Xerox copier dry ink and toner cartridges.

Department of Natural Resources (DNR) – Remanufactured parts are used in repairs whenever they are available.

North Hennepin Community College (NHCC) – All departments of this college are encouraged to return fax machine ink 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. The purchase of paper products containing some amount of recycled material is strongly encouraged.

Department of Transportation (Mn/DOT) – Mn/DOT purchases several remanufactured parts for vehicle parts replacements.

32. Tanks

Bemidji State University (BSU) – The university's three 30,000-gallon underground heating oil tanks were cleaned and inspected in November. The cost was $20,645, which included disposal of waste material from the tank bottoms. The tanks were found to be sound and no leaks discovered.

Department of Corrections

MCF-Red Wing – This facility has removed all belowground storage tanks and one aboveground tank used for heating oil. Currently, two inside storage tanks are used for #2 heating fuel.

MCF-Rush City – This facility has all aboveground tanks with spill containment.

Iron Range Resources and Rehabilitation Agency (IRRR) – Diesel fuel and gasoline are stored in underground storage tanks (new in 1999) at the agency's administration building.

Metropolitan Airports Commission (MAC) – All existing tanks are fully compliant with federal regulations. Tank monitoring systems ensure inventory control, and regular inspections prevent problems from developing that could result in a spill or release. At MSP, a 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.

Minnesota State Colleges and Universities (MnSCU)

Hennepin Technical College, Brooklyn Park

BPC	2 @ 25,000 gallon for fuel oil
	1 @ 500 gallons for waste oil
	2 @ 1,000 gallon for gasoline
EPC	1 @ 20,000 gallons for fuel oil
	1 @ 200 gallons for waste oil
	2 @ 1,200 gallons for gasoline

Minnesota State University, Moorhead (MSUM) – MSUM has two 20,000-gallon underground tanks classified as aboveground elevated tanks. These tanks are equipped with continuous slab vaults, alarms, overfill protection, leak detection, and are inspected weekly. Also at the Physical Plant are one 1,000-gallon gasoline tank and one 560-gallon diesel tank. These are aboveground, double-walled tanks equipped with overfill protection, etc. A vital part in managing these tanks is the emergency spill response procedures. We currently have updated procedures in place and training provided to respond towards spills, overfill, puncture, and other such emergencies.

St. Cloud State University (SCSU) – A single unused underground storage tank was found under Richard Green House decking and removal is underway. A single unused underground storage tank will remain at SCSU. It is empty and below the basement floor of AH, an occupied house. Monitoring and perhaps removal is being planned. Spill containment control was expanded outside the dike to the delivery

connections of our twin #2 fuel oil aboveground storage tanks. Further SPCC plan and training action is underway.

Vermilion Community College – Underground fuel oil tanks were cleaned and inspected in 2005. Contaminated oil was removed, and the source of contamination was identified and will be corrected.

North Hennepin Community College (NHCC) – There are two fuel tanks located on this campus. A 10,000-gallon underground storage tank is used for #2 fuel oil for our boiler plant, and a 285-gallon aboveground tank is used for diesel fuel for the college's lawn equipment. The monitoring and secondary containment equipment on these tanks is checked frequently to ensure leaks, spills, or contamination does not occur. An Emergency Response Plan is maintained on site for any future contingency.

Department of Transportation (Mn/DOT) – Many Mn/DOT districts use salt brine tanks, which are used to produce and store salt brine. Currently, salt brine production systems are of double-walled fiberglass construction, which is resistant to degradation from salt. Mn/DOT fueling systems are composed 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 (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 U.S. 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. U.S. 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:

- **Prevent oil spills.** Operating procedures, such as inspections, recordkeeping, security, personnel training, and tank specifications, address this goal (40 CFR Section 112.7(e)).
- **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.
- **Prepare for responding to an oil spill.** Facilities that 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 (Admin) – The Resource Recovery Office provides waste reduction and recycling technical support to government agencies, which includes referrals to Minnesota Technical Assistance Program.

Department of Corrections

MCF-Rush City – TAP will be consulted as needed.

MCF-St. Cloud – St. Cloud has received a grant from the Office of Environmental Assistance and is

utilizing the OEA, city of Saint Cloud, Tri-County Waste Commission, and RETAP as technical resources to help identify and implement pollution prevention improvements.

MCF-Stillwater – Stillwater is currently pursuing an agreement with RETAP for environmental consultation.

Office of Environmental Assistance (OEA) – MnTAP helps businesses implement pollution prevention by helping them become more efficient and find alternatives to using hazardous materials. Technical assistance is tailored to individual businesses through a variety of services, including site visits, student interns, materials exchange, workshops, and industry-specific resources.

Each year MnTAP works to achieve its goal of reducing 4 million pounds of waste (as solid/hazardous waste, air emissions, and wastewater discharge), and saving companies $2 million. Overall, MnTAP documented reductions of 3.2 million pounds of waste and air emissions, reuse of 8.2 million pounds of waste, and 28.2 million gallons of water conserved, resulting in a total cost savings of $2.1 million to businesses.

Site visits. Site visits provide companies with a one-on-one assessment of pollution prevention opportunities and serve as a practical way to help businesses put pollution prevention practices in place by promoting team formation, scoping out potential student intern projects, and identifying potential grant/loan opportunities. Approximately 137 site visits were conducted this past year, primarily with industrial facilities related to food processing, healthcare, metal finishing, and utilities. Site visits helped companies reduce 1,089,767 pounds of waste, conserve 25 million gallons of water, and save $625,232.

Student interns. Implementing pollution prevention takes time and commitment. MnTAP internship work with six companies in 2005 resulted in pollution prevention documentation of 425 pounds of waste, and savings of $23,470. Past intern projects from 2003 to 2004 documented an additional reduction of 2.1 million pounds of chemicals, 3.2 million gallons of water conserved, and cost savings of $110,730. Additional waste reduction from the 2005 projects is projected in the next one to two years, including 6.1 million pounds of emissions, solid and hazardous waste, 43,000 gallons of water and 86,547 therms. These additional projected reductions, if implemented, will result in additional cost savings of $135,526. The 2005 intern companies included:

- Allina Hospital and Clinics, Minneapolis
- NordicWare, Minneapolis
- Stone Products, St. Cloud
- Stylmark, Inc., Fridley
- Thomas Engineering Company, Brooklyn Park
- U.S. Distilled Products, Princeton

Phosphorus reduction in the Upper Mississippi River Basin

This two-year project, funded jointly by the McKnight Foundation, the U.S. EPA, and the Minnesota Pollution Control Agency (MPCA), focused on the use of pollution prevention strategies in phosphorus management plans (PMPs) and technical assistance to reduce loading of phosphorus and other pollutants from industrial sources in the Upper Mississippi River Basin. Partners included city publicly owned treatment works (POTWs), the Minnesota Wastewater Operators Association (MWOA), and the MPCA.

Implementing MPCA's phosphorus management strategy in Minnesota to minimize nutrient input to lakes and streams requires POTWs to prepare a PMP and/or meet a one part per million (ppm) wastewater effluent standard. PMPs place a high priority on reducing phosphorus from industrial sources by implementing pollution prevention measures.

The Minnesota Technical Assistance Program (MnTAP) conducted outreach to over 100 POTWs and 100 industries through presentations and newsletters. Technical assistance included 120 phone calls with POTWs and 61 with industries, 36 site visits to POTWs and 51 site visits to industry, facilitating five pollution prevention teams, and sponsoring three student interns in companies. This level of technical assistance resulted in 35,152 pounds of phosphorus reduced, 4.5 million pounds of biological oxygen demand and total suspended solids reduced, 37 million gallons of water conserved, and $348,000 in cost savings to companies.

Companies benefit from pollution prevention because greater efficiencies minimize the loss of raw materials and result in reduced wastewater surcharges. Cities benefit from pollution prevention because less wastewater loading means less need for chemical treatment and reduced operating costs.

Three key factors were critical to the success of this project: regulatory drivers, relationships with POTWs, and implementation of pollution prevention practices. Phosphorus management plans and phosphorus limits were the regulatory drivers that caused POTWs to seek out MnTAP resources and assistance. Through the PMP process, relationships developed between MnTAP and POTWs through which MnTAP could promote pollution prevention and reach business clients. POTWs recognized the value of pollution prevention practices for their wastewater treatment plants and their industrial users, encouraging industry to use pollution prevention in order to meet current and future phosphorus reduction goals.

Metropolitan Airports Commission (MAC) – The Environment Department provides technical support to all MAC offices/divisions, as well as airport tenants and surrounding communities whenever possible. Assistance for the MAC's tenants is accomplished through phone calls, acting as a regulatory liaison, informational meetings, and providing resources.

Metropolitan Council Environmental Services (MCES) – In its participation with IPPAT, MCES is part of an information network that is very useful in the pollution prevention support offered to other public agencies. As a regulatory agency, MCES is active in pollution prevention technical support through the Industrial Waste and Pollution Prevention Section (IWPPS). This section continues to promote pollution prevention to its more than 800 permitted industrial users. During on-site inspections, IWPPS staff members regularly discuss pollution prevention issues and point out process areas where pollution prevention would result in waste reduction. Although MCES collects fees based on volumes and characteristics of wastewater through its Service Availability Charge (SAC), wastewater reductions associated with cost savings are encouraged for its users. pollution prevention 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 pollution prevention concerns. Work on mercury reduction continues with the Minnesota Dental Association through distributing recycling fact sheets and the evaluation of amalgam separation equipment (see detailed discussion in section 16, *Heavy Metals*).

The IWPPS has participated in national, regional, and local pollution prevention conferences and has cooperated as a member with Wakota CAER (Community Awareness and Emergency Response), North Metro CAER, and MnTAP in the sharing of information and public displays. Conferences in the past year include the MPCA Waste Conference, the MPCA Collection Systems Operators' Seminar, Minnesota Wastewater Operators Association and the American Electroplaters and Surface Finishers Society. The section participates in the Great Lakes Regional Pollution Prevention Roundtable through its website.

An intranet site is in place for the Environmental Quality Assurance Department (EQAD) within MCES, which includes "Pollution Prevention Pages" to promote pollution prevention and encourage new ideas. This publicly accessible Internet site can be found at www.metrocouncil.org/environment/PollutionPrevention/. Additional information, including an online version of the Waste Discharge Rules and a table of user rates and fees can be found at www.metro.council.org/environment/IndustrialWaste/.

The NPDES discharge permit for the Hastings WWTP required the preparation and submittal of a phosphorous management plan by February 2005. An internal team identified influent and effluent concentrations and mass loadings and reduction opportunities in plant operations. IWPPS created a phosphorous profile by examining past data, conducting a survey of dischargers, and from monitoring and analysis. A single permittee, a creamery, was identified for pollution prevention action in order to reduce phosphorus.

Department of Military Affairs – In the event of an environmental emergency, an 800 number has been established to contact the MNARNG Public Works Department or the Environmental Office. There is also an established department web page for sharing information throughout the organization.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Technical support is provided through OSHA, RECRA, MPCA, and private consultants.

St. Cloud Technical College (SCTC) – Technical support is provided through MPCA, DOER Safety and Industrial Hygiene Unit, University of Minnesota Chemical Safety Day Program, and other agencies as needed.

St. Cloud State University (SCSU) – St. Cloud State University frequently has highly accredited Technical Support provided by its Occupational/Environmental Health and Safety consultant, MacNeil Environmental Inc. (MEI). MEI has several Masters level O/EHS specialists on staff and has maintained a Minnesota Licensed Professional Engineer (Civil and Environmental) on campus for eight years in an office in the Buildings and Grounds Management center. The ready availability of this Certified Safety Professional/Certified Industrial Hygienist engineer has aided SCSU recycling, renovations, and waste minimization efforts. It has also fostered close support to the contractors and maintenance and custodial employees, supervisors, and managers most at risk on campus and most involved in pollution prevention projects and efforts. This has also aided substantial reductions in costs associated with hazardous waste and battery recycling.

Minnesota State University, Moorhead (MSUM) –Currently MSUM is undergoing a professional energy audit being conducted by the Energy Services Group. For more information on the audit, please refer to the section 5, *Audits* of this report. Routine assessments are performed internally at MSUM. The involvement of faculty, students, and staff on campus lends a high level of expertise to this assessment. Also, currently the Sustainable Campus Committee is working on a campus-wide environmental assessment through the National Wildlife Federation's Campus Ecology Program.

North Hennepin Community College (NHCC) – Often our first contact for technical support is our contracted specialist, McNeil Environmental Services, employed by the college in a consultant capacity on environmental and other safety issues.

Department of Transportation (Mn/DOT) – 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 pollution prevention 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 that 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 also 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. This manual is available for other state agencies, counties, and cities to use on the Mn/DOT website at www.dot.state.us/environment.html, then go into *Publications,* then into *Removing Paint from Bridge Steel Structures.*

Mn/DOT has developed an asbestos removal and building demolition manual designed as a guide, to comply with Minnesota air quality, waste management regulations, and minimize risk to the environment. A current form of the manual is on the Mn/DOT website at www.dot.state.us/environment.html, then go into *Publication,* then into *Asbestos and Regulated Waste Material Manual for Building Demolition or Relocations for Construction Projects.*

Mn/DOT is dedicated to studying, coordinating, and evaluating pollution prevention opportunities (as they relate to toxicity reduction) within Mn/DOT. The key task is to research and evaluate new products and/or procedures as they relate to Mn/DOT and 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 environmental regulations. Mn/DOT

provides ongoing guidance for local communities interested in designing and/or improving bicycling, walking, and telecommuting programs or initiatives.

University of Minnesota – The Regional Sustainable Development Partnerships unite citizens and their university working together to strengthen rural Minnesota (www.regionalpartnerships.umn.edu). The mission of the Regional Sustainable Development Partnerships is to support sustainable development in greater Minnesota through community and university partnerships in outreach, education, and research. The three bedrock principles of this initiative are:

- develop and sustain a richer and more vibrant partnership with the citizens of each region and their land grant university.
- address agricultural, natural resources, and tourism issues consistent with sustainable development principles identified as central to our work.
- promote the concept of active citizenship, which calls on us to think first as citizens with a commitment to working through issues and exploring opportunities in an integrated and democratic manner.

We are also guided by principles of sustainability—in other words, what can help us meet needs of the present without compromising the ability of future generations to do so. The Regional Sustainable Development Partnerships work to sustain Minnesota's natural resource-based communities and industries by addressing community-identified agriculture, natural resources, and tourism issues in partnership with the University of Minnesota.

Three core goals shape the work of the Regional Partnerships, and form the basis on which we evaluate our effectiveness. These goals are:

- to build and strengthen effective relationships between citizens, communities, and theUniversity of Minnesota.
- to promote active citizen leadership in strengthening the long-term social, economic, and environmental health of greater Minnesota.
- to invest in research, education, and outreach projects that advance the understanding and achievement of regional sustainability.

Regional partnerships have been established in northwest, northeast, central, west central, and southeast Minnesota. Additional partnerships are anticipated in the future. Each Regional Sustainable Development Partnership funds research, education, and outreach projects that address issues affecting the long-term sustainability of their regions' natural resource-based industries and the communities that depend on them. Focusing on agriculture, natural resources, and tourism, regional projects reflect the concerns and interests of engaged citizens and partner those citizens with University of Minnesota faculty and students.

Each regional partnership has a board made up of citizens with backgrounds and interests in agriculture, natural resources, tourism, and sustainability as well as university faculty and staff from a wide range of departments. A Statewide Coordinating Committee composed of staff and citizens from each region, at-large citizen representatives, and representatives of the three partnership colleges provide leadership for the program's coordinated efforts. To date, the Regional Partnerships have funded over 175 projects for a total of $3 million. The five regions are also currently collaborating on three major community/university ventures:

- **Energy Self-Reliance Community/University Venture** works to increase farm and community energy self-reliance through renewable fuels, energy conservation, and community ownership and governance of energy resources.
- **Local Food Economies Community/University Venture** works to get wholesome and delicious foods—produced locally—into the hands of consumers and to do it in a way that yields a fair profit for the producer or farmer by creating regional food systems that sustain production, distribution, and marketing opportunities.
- **Appreciating Rural Assets Community/University Venture** works to identify and capitalize on the natural, human, and financial resources of rural communities through community and economic development programs related to tourism, land use, rural policy, and local business development.

The University of Minnesota Center for Sustainable Building Research (CSBR), (http://www.csbr.umn.edu), 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 Minnesota, the design professions, and the building industry.

Dynamics, management, and sustainable use of northern forest ecosystems

"For nearly a century, research at the Cloquet Forestry Center has provided valuable information to help guide the appropriate use and management of northern forest ecosystems." The Cloquet Forestry Center (http://www.cnr.umn.edu/cfc), founded in 1909, supports multiple research projects covering many disciplines initiated by University of Minnesota and other researchers. Research conducted at the Cloquet Forestry Center focuses on sustainable use and management of northern forest ecosystems, thus helping citizens and communities balance the ecological, economic, and social demands placed on forests. The center plays a key role in offering a secure location, logistics, and/or technical support to the projects. "The center's combination of cutting-edge and long-term projects offers insights about natural resource management unequaled in the region," said center coordinator, Bob Stine.

While protecting ongoing research, the center is managed to maintain a variety of forest ecosystems and other sites for teaching, research, and outreach activities. Much of the research conducted at the center is aimed at developing forest management practices that integrate multiple values, including fiber, wildlife, air and water quality, recreation, aesthetics, and ecosystem function. Factors evaluated include:

- **Environmental details:** Sustainable management of Minnesota's forest lands is important for current and future generations.
- **Economic details:** Sustainable forest management includes economic benefit across all levels of society, from landowners (both the 140,000 private woodland owners and also public owners), to processors (loggers, bough buyers, gatherers, etc), to manufacturing industries. There are hundreds of small and large primary and secondary wood products firms.
- **Quality of life details:** Forests play an integral role, either directly or indirectly, in the lives of most Minnesotans.

Research at the Cloquet Forestry Center is grouped in the following categories:

- monitoring the response of forest ecosystems to activities such as planting, thinning, harvesting, prescribed burning, genetic tree improvement, vegetation management, and natural disturbances.
- establishing and evaluating long-term ecological studies to assess the dynamics of change and to understand natural processes.
- developing and applying forest genetic resource management techniques, including gene conservation, selection, breeding, and deployment.
- characterizing the hydrometeorological characteristics of watersheds on and near the Cloquet forest.
- evaluating residential construction products and techniques in cold climate conditions.
- expanding wilderness research capabilities in collaboration with the Wilderness Research Center.
- using the center's data bases for development of multiple resource management models.
- using the center and its research and management activities as a field laboratory for the training of natural resource professionals and for the demonstration and communication of research to interested publics.

34. Tires

Department of Administration (Admin) – The Materials Management Division has contracts for tire recovery and for retread tires utilizing 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 $900,000 in retread tires in FY 2005. The Materials Management Division's *Waste Tire Pickup, Transportation, Processing, and Disposal* contract recycles waste tires. The tires are processed into chips, which are then recycled for use in road surfaces. The Travel Management Division's used tires are recycled through a vendor licensed under state contract.

Department of Corrections (DOC) – Multiple facilities recycle used tires.

Iron Range Resources and Rehabilitation Agency (IRRR) – Used tires are transported to the regional landfill in Virginia, and from there the tires are brought to R and J Tire in Meadowlands to be shredded and recycled into various rubber products such as rubber mats for truck boxes and solid fuel for burners.

Metropolitan Airports Commission (MAC) – High mileage tires have provided the most economical service in many applications and utilizing 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 (MCES) – Used tires are generated at two locations where significant vehicle maintenance is performed. Tires are picked up by Greenman Technologies in Savage and are ground up for fuel in energy production. In 2004, 162 tires were sent for energy recovery.

Department of Military Affairs – The MNARNG recycled 68,000 pounds of tires through the Defense Reutilization Marketing Office (DRMO) in Duluth.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – All tires are recycled through a local vendor at a cost to ATC.

Central Lakes College, Brainerd and Staples – We encourage our heavy equipment and diesel programs to have suppliers take the used tires when purchasing new.

Hennepin Technical College, Brooklyn Park – Tires are recycled by Goose Lake Salvage.

Minnesota State University, Moorhead (MSUM) – All used tires are replaced and recycled at an off campus vendor.

Northwest Technical College, Bemidji, MN– All tires are recycled.

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

St. Cloud Technical College (SCTC) – All tires are recycled through local through local vendors.

Department of Natural Resources (DNR) – All used tires at DNR shops are recycled through the contract vendor on state contract. The tires are stored until there is sufficient number for the vendor to come and pick them up.

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

Department of Transportation (Mn/DOT) – Mn/DOT recycles all waste tires generated by Mn/DOT as well as the tires that are found 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, (plowing snow) only a limited amount of re-capped tires can be safely used.

35. Water Treatment and Conservation

Department of Administration (Admin) – 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 improve as a result of this contract.

Bemidji State University (BSU) – Water conservation devices installed in 2002 continue to reduce water consumption by approximately 3 million gallons per year as compared to pre-installation usage. That represented a savings of approximately $25,000 in FY 2005.

Department of Corrections

MCF-Oak Park Heights – Replaced a freezer water cooler condenser with a cooled air condenser, eliminating the need to use water for this purpose.

MCF-Rush City – This 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. Outdoor sprinkler system is on a timer to conserve water. We have also installed a salt reclaimer for more efficiency. The new system is saving this facility 30 percent on salt used or 79,000 pounds per year for water softening.

Office of Environmental Assistance (OEA) – Water conservation continues to be an area where businesses have an opportunity to conserve resources. MnTAP helped companies reduce 28.2 million gallons of water in 2005.

Metropolitan Airports Commission (MAC) – 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 use 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 (MCES) – The MCES is the division of the Metropolitan Council that treats wastewater. The system collects and treats over 300 million gallons of wastewater per day from 103 communities and over 2 million people. The MCES operates about 600 miles of interceptor sewers, 63 lift (pumping) stations, 190 metering stations, and eight treatment plants. The current annual operating budget of the MCES is $170 million with a capital budget of $199 million. Clean effluent is discharged to four area rivers—the Mississippi, Minnesota, St. Croix, or Vermillion. From the Metro WWTP alone, over 74 billion gallons of treated wastewater were discharged to the Mississippi last year. Pollution prevention effecting the quality of effluent was described in the section on heavy metals.

One area that clearly falls under pollution prevention 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 2004, a total of 12,419 dry tons from the Metro WWTP and 1,775 dry tons from the Seneca WWTP (Eagan, Dakota County) were utilized.

Straight biosolids (without any blended components) are typically landspread on farm fields. The Empire WWTP spread a total of 6,568 wet tons and 1,048 dry tons of biosolids directly to approved sites. A total of 12,695 tons of heat-dried biosolids in the form of pellets from the Blue Lake WWTP in Shakopee was produced for land-application in 2004.

Department of Military Affairs – Spill Prevention Control and Countermeasure Plans for all MNARNG facilities have been recently upgraded.

Minnesota Pollution Control Agency – The Minnesota Pollution Control Agency's Brainerd office has leased premises that feature water conservation fixtures including low-volume flush toilets. In May 2003, the MPCA renegotiated its lease on its St. Paul office. As part of that lease the MPCA suggested the installation of low-flow water conserving plumbing fixtures. This activity is planned and has not yet taken place.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College (ATC) – Alexandria Technical College has installed automatic flushing units on low consumption toilets and urinals and low flow faucets. Our campus provides a reverse osmosis water source for its employees in the staff lounge. Wastewater is treated through our municipal water treatment plant.

Hennepin Technical College, Brooklyn Park – Chilled water and heating loops, cooling towers and boilers at both campuses.

Minnesota State University, Moorhead (MSUM) – MSUM uses a computer managed watering system has been installed on the athletic field, in addition to the systems installed on the campus mall area and surrounding landscaped areas. This system initiates watering at night, thereby reducing water evaporation. A storm water detention pond and underground drainage system was recently completed and is managed under the university's storm water pollution prevention program. This system will significantly reduce the amount of contaminated run-off water directly flowing into the city's storm sewer. An energy audit is currently being conducted by Energy Services Group with a focus on a water usage assessment.

St. Cloud State University (SCSU) – This past year, progress continued at SCSU on replacing systems to reduce water use. 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. A MnSCU survey resulted in some water conservation improvements. A dorm (SBH) flushing retrofit project cut water usage by half. However, the lower flows put SBH into a subsequently higher rate which resulted in anticipated saving becoming a wash.

North Hennepin Community College (NHCC) – 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 anti-siphon devices.

Department of Transportation (Mn/DOT) – Mn/DOT is using low consumption toilets, urinals, and sinks that use one-third of the water as compared to traditional fixtures, thereby saving thousands of gallons of water each day. Mn/DOT developed a waste and sediment trap management procedure when disposing of wastewater that is 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.

University of Minnesota – The Water Resources Center (WRC) (http://wrc.coafes.umn.edu) is a multifaceted center with active programs in research, outreach, and education. The WRC works to help coordinate, conduct,

and fund research and outreach related to water resources in the state of Minnesota enabling more effective delivery of research results to decision-makers and citizens; opening new avenues for multi-disciplinary and interdisciplinary partnerships; and providing a critical link between students and water resources professionals, allowing students maximum access to the university's water programs. The graduate program in Water Resources Science also is administered by the WRC. The WRC's creation in 1996 united three long-standing University of Minnesota water programs, the Water Resources Research Center, the Center for Agricultural Impacts on Water Quality, and the Extension Water Quality Program, into a larger enterprise. The goal of the WRC is to integrate the missions of the three water programs.

36. Other

Department of Administration (Admin) – The Materials Management Division, in conjunction with the Minnesota Pollution Control Agency, has developed a contract for the technical operation and maintenance of closed landfills. This contract prevents air pollution by burning off gas through flares, and helps prevent groundwater pollution near the landfills by collecting and removing condensate and leachate produced in the landfills. The Materials Management Division has developed contracts for using the waste food from the correctional facilities for feed for farm animals, thereby reducing the amount of solid waste going into landfills.

Department of Corrections (DOC) – Multiple facilities have arrangements with local farmers to have food waste picked up and used for feed. This reduces the amount of waste sent to landfills and the amount of water sent to the water treatment facilities.

MCF-Faribault – Faribault eliminated hand towels from all living units and installed hand dryers; the facility also recycles cardboard at a savings of $7,747 annually.

MCF-Oak Park Heights – Recycles foam mattresses and pillows thereby eliminating these items from the waste stream.

Office of Environmental Assistance (OEA) – In February 2001, the OEA started an experimental worm bin. The goals of the bin were to create a bin that was inexpensive, easy to maintain, and would recycle a substantial amount of food waste from the office. The bin has been maintained for three years, and we are now tracking how much waste we are able to divert from the trash. The worms have devoured over 300 pounds of food in the three years we have maintained a bin.

In the spring of 2005, the OEA stopped using its worm bins. The bins had become infected with fruit flies and even though OEA staff tried several remedies to get rid of the fruit flies, they were not successful. The bin was inside, close to staff working areas, and the fruit flies were so numerous that they had no other choice but to stop using the bins. The bins were cleaned and then auctioned off to staff that are now using the bins at home. All of the organics that were going to the worm bin now go to the commercial composting program the building maintains.

Iron Range Resources and Rehabilitation Agency (IRRR) – Aluminum cans at all of the agencies facilities are collected and brought to various recycle locations.

Metropolitan Council Environmental Services (MCES) – In 2004, the MCES received two MN GREAT! Awards. The first was for sustainable design or green building achievements at the Eagles Point WWTP in Cottage Grove. The second award recognized the shared achievements of MCES and the Minnesota Dental Association's reduction of sewered mercury through the Voluntary Dental Clinic Amalgam Recovery Program.

Odor control is a significant activity in the wastewater treatment process. Traditional odor control involves the collection of air that is passed over inert media that is sprayed with sodium hydroxide (caustic) or sodium hypochlorite (bleach), which destroys sulfur-bearing air borne compounds. Other traditional odor control

technologies involve the oxidation of compounds over potassium permanganate pellets or scrubbing though activated carbon. An alternative odor control technology passes this same air though a biofilter. The biofilter is a blend of compost and a bulking agent, such as wood chips, which enhances the growth of naturally occurring microorganisms that consume and break down the sulfur bearing compounds. At the metro WWTP, it is estimated that the biofilter reduces the need for 100 gallons of caustic and 100 gallons of bleach every day. Operating costs of the biofilter include electrical fans for air pressure and periodic media replacement. The estimated cost of energy and media replacement at $220,000 per year is slightly more than half of the cost of operating an equivalent chemical scrubber.

Department of Military Affairs – The MNARNG has established a "recycling" account that is used to fund pollution prevention and other environmental projects. Money is generated from the sale of recyclable materials and from an account established with the Defense Reutilization and Marketing Office (DRMO), which markets hazardous materials received from MNARNG facilities and returns a portion of the money to this account. The Environmental Quality Control Committee, made up of senior DMA staff, controls these funds. Pollution prevention projects funded by this account include the purchase of aerosol can puncture devices for the maintenance shops and purchase of parts cleaning machines for the maintenance shops.

Minnesota Pollution Control Agency – Several regional MPCA offices have specific reduction programs in effect including composting food waste; vermicomposting/leachate used as indoor plant fertilizer in office; using refillable soda bottles; and promoting paper reduction initiatives.

The Alliance for Recycling and Reduction of Waste (ARROW), a group of MPCA employees who serve as a point of contract for any recycling (reuse, reduce, or rethink) or composting questions, has maintained an extensive composting project since September of 1999. The project allows all compostable materials (including cafeteria food waste, napkins, biodegradable utensils, and paper towels from restrooms) to be collected and managed separately from non-compostable refuse. Through the first eight months of the program, 28 percent of the solid waste generated was composted. In 2004, 64 tons of solid waste was discarded and 12 tons of material was composted.

The MPCA Brainerd office has found "homes" for used office items in 2004, including credenzas, desks, and file cabinets.

The Duluth MPCA office started composting food waste using worms in 2000 and continues that practice. As of August 2005, the office has composted just over 700 pounds of food waste. In 2004 Duluth composted 90 pounds, and so far in 2005, 43 pounds. Staff then use the worm by-products as fertilizer and soil amendment for gardens at their homes. The Duluth office also had a Green Power Campaign. The campaign was aimed at encouraging state employees to purchase environmentally friendly power from local power companies. Over 10 percent of the office signed up.

The Rochester office has for years taken envelopes sent to it, and reused them by converting them into interoffice mail envelopes. Rochester also makes a concerted effort to carpool to St. Paul as much as possible. The Rochester office also reuses old furniture. Rochester keeps a compost bucket for coffee grounds and vegetable waste. A staff member takes it home and uses it on his garden. Two staff members team up and get soda directly from the Coca-Cola bottler in Winona so there is no waste aluminum to recycle. Paper shredded in the Rochester MPCA and Minnesota Health Department offices is bagged and taken home by a staff member for use as bedding by his neighbor's calves. One staff member located by the printer tries to use paper for printing that had been printed previously only on one side.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead (MSUM) –The 2003–2004 development of the Sustainable Campus Committee was a big step for the MSUM community towards a more environmentally sound future. This committee formed following the creation of a sustainable campus initiative involving a group of students. The student senate approved the initiative, and soon after a committee was formed. Members include students (majority), faculty, staff, and administrators. To fund projects of the Sustainable Campus Committee, a fee of $3 per semester per student was approved. This fee will generate approximately

$45,000 per academic year. The committee was successful during the fall of 2004 in implementing a recycling program within the residence halls and is working to expand that program for the 2005–2006 academic year. One of the initiative's driving goals is to research and implement a student-owned wind turbine. This turbine would cost approximately $1.5 million and would provide enough energy for MSUM to supply the Student Union, Health Center, and proposed Wellness Center. To help promote the initiative, a logo contest was held in the spring of 2005. A winning logo was chosen from a group of student-submitted designs by the committee. The logo will be used for promotion, but will also serve as a symbol for educational materials as well. Education at MSUM and within the surrounding community is a vital part of the sustainable campus initiative.

St. Cloud State University (SCSU) – SCSU has recycled glassware from the Biology stockroom due to the ongoing initiative of a very supportive faculty member.

St. Cloud Technical College (SCTC) – November 2004, a hazardous waste collection period was announced and old/excess chemicals from the labs and classrooms were turned in for reuse or disposal. This prevents these chemicals from accidentally spilling and entering the air as well as the water or ground.

Department of Transportation (Mn/DOT) – Mn/DOT has expanded the Hazard Evaluation Process for evaluating waste materials before use in roadway infrastructure to include virgin products not containing waste materials. Through extensive safety review, Mn/DOT has developed a specification approving the use of all-steel guardrail posts. Steel guardrail 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.

Mn/DOT recycles approximately 1.5 million tons of asphalt and 2 million tons of concrete annually. Mn/DOT is responsible for all containers found in Mn/DOT right-of-way under 110 gallons. The department developed a safe, practical, and cost-effective procedure to manage this material, much of which is recycled with the waste Mn/DOT generates. Mn/DOT is a strong advocate of electronic communication: e-mail and teleconferencing.

University of Minnesota

Clean Air Minnesota partnership: The University of Minnesota became a partner in Clean Air Minnesota. The university's Waste Abatement Committee and Facilities Management staff has started working with Clean Air Minnesota staff to evaluate, plan, and implement air pollution strategies for the university.

Clean Air Minnesota is a voluntary partnership of businesses, environmental groups, government agencies, and citizens working together to achieve significant, measurable reduction in air pollution. Clean Air Minnesota's approach unites partners to craft voluntary pollution solutions before Minnesota violates federal air quality standards. This groundbreaking program follows a Minnesota tradition of leadership on environmental and health issues. Leveraging the resources and expertise of its partners, Clean Air Minnesota works to achieve real emissions reductions. Clean Air Minnesota's action plan centers on improving air quality by reducing emissions generated by individuals and businesses.

Water quality – storm water pollution prevention plan: The university has developed a storm water pollution prevention plan and submitted to the Minnesota Pollution Control Agency a municipal separate storm sewer system permit application for the Twin Cities campus (http://www.dehs.umn.edu/iead/stormwater) in order to meet storm water regulations of the National Pollutant Discharge Elimination System permit program. This 1987 amendment to the Clean Water Act developed a program to minimize or eliminate pollutants from entering water runoff. Finalizing the storm water pollution prevention program was only the first step in protecting storm water runoff on campus.

Over the next five years, the prevention plan shifts into an improvement plan that could change a few aspects of the university environment. The improvement plan will probably change how university workers keep grass green during the summer and deice sidewalks in winter. In response to the federal requirements, a university storm water task force of six faculty and staff brainstormed, studied data, and discussed strategies for protecting the environment against further pollution. The regulations required applicants to submit proposals in six areas to further minimize contaminates from entering storm water. From extending public outreach and

education to controlling illicit discharges and maintaining clean construction sites, the university task force followed permit guidelines and laid groundwork to save the environment from further degradation. The task force will continue meeting to make sure the university meets the storm water pollution prevention plan.

The Commission on Environmental Science and Policy: The Commission on Environmental Science and Policy (http://www1.umn.edu/enviro/index.html) was created by Executive Vice President and Provost Robert L. Bruininks in recognition of a need to capitalize on the effort expended by the university on environmental issues by enhancing the conditions for new synergistic activities both within the university and between the university and the communities it serves. Environmental science and policy are potentially the largest single unifying subjects across the broad spectrum of administrative units and faculty of the University of Minnesota. This is a response to the great societal need to identify alternatives and inform decisions that address the serious environmental challenges facing Minnesota, the United States, and the world community. Numerous University of Minnesota components have demonstrated their commitment to address the needs of Minnesota communities through active pursuit of research, teaching, and outreach programs that address their needs at a variety of scales. Environmental science, ethics, and policy—and the concepts they embody—can be a unifying principle for a wide range of interdisciplinary problems and solutions.

The overarching goal of the commission is to enhance, foster, and make more visible our efforts in research, education, and outreach in "environment" at the University of Minnesota. We want to improve the environmental literacy of our students, of the citizens of our state, and of the world community. We also need to help society make well-informed judgments about the social and biophysical options, and associated consequences, that are critical to the decision-making process. Over the longer term, our vision is to achieve an international reputation as the recognized leader in this field. Achieving this goal will require a more cohesive, synergistic organization of the university's environmentally related resources. Creation of such a system would allow the university to transcend the mere sum of its leading programs and scholars.

The 32-member commission carefully considered the university's many strengths and opportunities in the broadly defined environmental arena. They found the university can be justifiably proud of its efforts in environmental science and policy, but it is missing opportunities and falling short of its potential. More importantly, it is falling short of society's need for environmental awareness, understanding, and action guided by science. Their report identifies 27 recommendations clustered in three areas: communication, coordination, and capacity. The recommendations are viewed as a starting point for further discussion. With refinement they could become a new academic initiative for the university.

Water quality – field drainage research

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 conducting 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 but not 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. At the mouth of the Mississippi River in the Gulf of Mexico, hypoxia occurs where aquatic life is severely compromised because of chemical runoff.

Activity type	Department of Administration	Department of Agriculture	Bemidji State	Department of Commerce	Department of Corrections	Department of Employee Relations	Dept. of Employment and Economic Development	Office of Environmental Assistance	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council– Environmental Services	Met Council– Metro Transit	Metropolitan Mosquito Control	Metropolitan State	Department of Military Affairs	Minnesota Pollution Control Agency	Minnesota State Colleges and Universities (MNSCU)	Department of Natural Resources	North Hennepin Comm. College	Revenue	Department of Transportation	University of Minnesota
Absorbents	FY05 O/P				FY05 O/P				O	O	O/Q	FY05 P			O/P		FY05 O/P/Q				O	O
Adhesives	FY05 O/P														O		FY05 O		O			
Air quality, CFCs	FY05 O/P	O			FY05 O/P		FY05			O	O	FY05 O/P			O/P		FY05 O/P		O		O	O
Antifreeze	FY05 O/P				FY05 O/P				O	O	O	FY05 O			O/PQ		FY05 O/Q	o	O		O	O
Audits	FY05 O/P				FY05 O/P					O	O	O/P			O/PQ	P	FY05 O/P				O	O
Auto fuels	FY05 O/P/Q	O		FY05 O/P/Q	FY05 O/P		FY05 O/P	FY05 O/P	O	FY05 O/P/Q	O		FY05 O/P	O	O/Q	O/P	FY05 O/P/Q		FY05 O/P	O	O	FY05 O/Q
Auto maintenance	FY05 O/P			FY05 O/P	FY05 O/P/Q				O	FY05 O/P	O		FY05 O/P		O		FY05 O/Q			O	O	O
Batteries	FY05 O/P			FY05 O	FY05 O/P			FY05 O/P	O	O	O/Q	FY05 O			FY05 O/P	O	FY05 O/Q	O		O	O	O
Cleaning supplies	FY05 O/P	O			FY05 O/P/Q			FY05 O/P	O		O	FY05 O			O	O	FY05 O/P/Q	P		O	O	O/P
Commuting & transportation	FY05 O/P		O	FY05 O	FY05 O/P	P	FY05 O/P	FY05 O/P	O		O/Q	FY05 O/P			O	O	O		FY05 O/P/Q	O	O	FY05 O/P/Q
Education, comm. & training	FY05 O/P	O	O		FY05 O/P	P		FY05 O/P		O	O	P	O		FY05 O	O/P	FY05 O/P			O	O	FY05 O/P
Electronics	FY05 O/P			FY05 O	FY05 O/P	FY05 P/Q		FY05 O/P	O	O	O/Q			O	O	FY05 O	FY05 O/Q		FY05 O/P/Q	O	O	O
Energy– lighting	FY05 O/P		FY05 O/P/Q		FY05 O/P		FY05 O/P	FY05 O/P	O	O	O/Q	FY05 O/P		O	O/P	O/P	FY05 O/Q		FY05 O/P/Q	O	O	O
Energy – production	FY05 O/P		FY05 P/Q	FY05 O/P	FY05 O/P		FY05 O/P	FY05 O/P			O/Q	O			O	O/P	P			O	O	FY05 O/P
Groundwater wells	FY05 O/P				FY05 O/P						O	O			O/P		O			O		
Heavy metals	FY05 O/P	O			FY05 O/P			FY05 O/P			O/Q				FY05 O		FY05 O/Q			O	O	O
HVAC, indoor air quality	FY05 O/P		FY05		FY05 O/P		FY05 O/P		O	FY05 O/P		O/P			O	O/P	FY05 O/P			O	O	FY05 O/P
Ice control, sanding	FY05 O/P		O		FY05 O/P				O	O		FY04 O/P			O		FY05 O/P/Q			O	O	O

Activity type	Department of Administration	Department of Agriculture	Bemidji State	Department of Commerce	Department of Corrections	Department of Employee Relations	Dept. of Employment and Economic Development	Office of Environmental Assistance	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council–Environmental Services	Met Council–Metro Transit	Metropolitan Mosquito Control	Metropolitan State	Department of Military Affairs	Minnesota Pollution Control Agency	Minnesota State Colleges and Universities (MNSCU)	Department of Natural Resources	North Hennepin Comm. College	Revenue	Department of Transportation	University of Minnesota
Laboratory	FY05 O	O	O	FY05 O	FY05 O/P						O					FY05	FY05 O/Q		O		O	O
Landscaping	FY05 O/P		O		FY05 O/P				O					O/P	O	O/P	FY05 O/P/Q				O	FY05 O/P
Materials exchange	FY05 O/P				FY05 O/P			FY05 O/P		O	O	P			FY05 O	FY05	FY05 O		O			O
Office supplies	FY05 O/P/Q	O	O	FY05 O	FY05 O/P/Q			FY05 O/P	O/Q	FY05 O/P/Q	O		O/P	O	O/Q	O/P	FY05 O		O		O	O/Q
Oil, oil filters	FY05 O/P				FY05 O/P				O	O	O/Q	O	O		FY05 O/Q		FY05 O/Q	O	O		O	O
Paints, coating, stripping	FY05 O/P		O		FY05 O/P					O	O	FY05 O/P		O	FY05 O	FY05 O	FY05 O/Q		O		O	O
Parts cleaning	FY05 O/P								O	O	O/Q	FY05 O/P			O/P		FY05 O/P/Q	O			O	O/Q
Personal care															O		O					
Pesticides, fertilizers	FY05 O/P	O			FY05 O/P										O		FY05 O/Q		O		O	O
Policy statement	FY05 O/P	O	O	FY05 O	FY05 O/P			FY05 O/P	O	O	O	FY05 O/P			O		FY05 O/P		O	FY05 O/P/Q	O	O
Printing	FY05 O/P			FY05 O/P/Q				FY05 O/P							O	O	FY05 O		O		O	O
Procurement	FY05 O/P	O	O		FY05 O/P	FY05 O/P	FY05 O/P	FY05 O/P	O	O	O	FY05 O/P			O/P	O	FY05 O/Q		O		O	O
Remanufactured parts	FY05 O/P		O						O	O		O			O	O	FY05 O		O		O	
Tanks	FY05 O/P		FY05	FY05 O	FY05 O/P				O	O	O	FY05 O/P			O		O/Q		O		O	O
Technical support	FY05 O/P				FY05 O/P			FY05 O/P	O	O	O				O		FY05 O		O		O	O
Tires	FY05 O/P								O	O	O/Q	FY05 O/P			O/Q		FY05 O/Q		O		O	
Water treatment, conservation	FY05 O/P		O		FY05 O/P			FY05 O/P		O	O/Q	FY05 O/P			O	O/P	FY05 O		O		O	O
Other	FY05 O/P				FY05 O/P			FY05 O/P			FY05 O				O	FY05 O	O				O	O