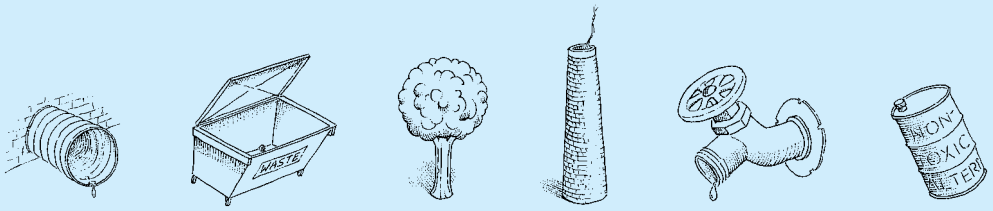
Interagency Pollution Prevention Advisory Team [IPPAT]



Pollution Prevention Summary Report

Consolidated from reports submitted by members of the Interagency Pollution Prevention Advisory Team

Fiscal year 2007

March 2009

POLLUTION PREVENTION
Right From The Start

Table of Contents

TTY 651-282-5332 or 800-657-3864 | available in alternative formats | published April 2009

p-p2s7-16

Introduction

The Interagency Pollution Prevention Advisory Team (IPPAT) is a group of representatives from state agencies, colleges, and universities that cooperate in the execution of the Governor's Executive Order 99-4. Executive Order 99-4 provides for the implementation of pollution prevention and resource conservation by state government. The group meets four times each year to share information and offer case studies on pollution prevention, including waste reduction and resource conservation. Agency contacts are listed on the inside back cover.

IPPAT is coordinated by the Minnesota Pollution Control Agency. For more information about IPPAT or this report, contact Linda Countryman at 651-215-0269, 800-657-3864, www.pca.state.mn.us/ippat.

Purpose of the report

Every year, state agencies are required to prepare a summary of their progress in preventing pollution. These reports are consolidated into a single summary report, which fulfills the requirements of Governor's Executive Order 99-4. An original signed copy of each agency's report is on file at the Minnesota Pollution Control Agency.

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.

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 had during fiscal year 2007.

Department of Administration (Admin) – The mission of the Department of Administration (Admin) is "to help its customers succeed." The department provides a diverse range of business management, administrative, technological and professional services, and a variety of resources to state and local government agencies and to the public.

With 13 distinct business units and about 511 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, Admin is committed to offering the best possible service, enabling state government to work more efficiently.

Information about the department and its environmental services is available from the following Internet sites:

- www.admin.state.mn.us
- www.RRP.state.mn.us
- www.mmd.admin.state.mn.us

The department's Materials Management Division (MMD) and the Resource Recovery Program (RRP) incorporate pollution prevention in their service to state and local agencies, and outreach through Minnesota's State Resource Recovery Program. The RRP is part of the Administration's Plant Management Division (PMD).

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
- Operation of the Minnesota State Recycling Center

The RRP also works closely with MMD to implement the program's environmental purchasing and surplus property requirements. The purpose of the program (as set forth in Minn. Stat. § 115A.15 Subd. 1) 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
- Uniformly dispose of recovered materials and surplus property

Five environmental awards resulted from the Administration's customer services in the last seven years, demonstrating public recognition of the program's achievements.

Department of Agriculture (MDA) – The Minnesota Department of Agriculture currently employs 439 people in 10 staffed locations. MDA is currently co-located with the Department of Health in the Freeman Office Building located at 601 North Robert Street in St. Paul. The department was previously housed at 90 West Plato Blvd. in St. Paul. This report details actions that were taken at the Minnesota Department of Agriculture headquarters in the Freeman Office Building.

Department of Commerce – The department employs 35 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 2007 for the Department of Corrections. The DOC has approximately 4,300 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, including air, water, and solid and hazardous waste. Physical Plant staff from both MCF-Oak Park Heights and MCF-Stillwater were trained and recertified in asbestos handling procedures in December 2006. General maintenance workers attended training on new, safer cleaning products and energy savings equipment. X-ray machine training is provided to dock and maintenance personnel.

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 2007. Please note, this is the last report from DOER, as this agency was eliminated in 2007. Its programs were moved into the Departments of Administration and Finance.

Department of Employment and Economic Development (DEED) – DEED has approximately 1,500 employees working in 49 staffed facility locations. This report includes information for our whole agency. DEED staff has not received any P2 training during the past year.

Iron Range Resources and Rehabilitation Agency (IRRR) – Iron Range Resources is a state agency that strives to enhance the economic vitality of the Taconite Assistance Area (TAA) 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 55 employees as of August 1, 2007. 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 the for the staffing needs of Administrative Services, Development Strategies, Marketing and Communications, and Tourism.

The second facility is the Mining, Minerals, and Reclamation Division located in Chisholm. It houses the staff and programs that support and promote existing ferrous mining activity and diversification, promote non-ferrous mining projects, and undertake safety, environmental, and economic development projects on abandoned minelands of the pre-taconite era, often in cooperation with adjacent communities. This year, Iron Range Resources' Mineland Reclamation grew 300,000 containerized seedlings in an onsite growth chamber. The seedlings were planted on the Mesabi, Vermilion, and Cuyuna iron ranges.

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, offering guests two championship 18-hole golf courses, The Legend (named Minnesota's number one public golf course by *Golf Digest* in 1999), and a second 18-hole championship golf course, The Quarry, which was named "the best new upscale public golf course in the nation" by *Golf Digest* in 2005.

The resort's ski area is ranked #3 in the Midwest and #1 in Minnesota and features 34 alpine ski runs; 70 kilometers of groomed cross country ski trails; the Midwest's best snowboard terrain park; easy access to thousands of groomed snowmobile trails; hiking; biking; canoeing; an 18-hole disc golf course; a variety of

lodging choices on site and in the surrounding area; great food, special events and entertainment. Approximately 100,000 skiers hit the slopes and cross-country trails in 2007.

Giants Ridge is 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 through tourism.

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 2006, MSP serviced more than 35 million passengers and supported 475,000 flight operations. The reliever airport system supports more than 500,000 flight operations per year.

MAC presently employs 550 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 Director's office, Energy Management, and Facility Management.
- **Airside** consists of Operations, Carpentry, Communications, Electrical, Fire, Police, Maintenance (field and mechanical), and the Paint Shop.
- Administration includes Airport Development, Environment, Commercial Management, Executive, Finance, Human Resources, Insurance/Risk, Labor Relations, Legal, 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 645 staff (full-time equivalent positions). This report describes P2 activities for the entire MCES. A separate report will cover pollution prevention for Metro Transit, the division of the Metropolitan Council that provides public transit (bus service and 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 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 53 full-time staff and approximately 190 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 2007 fiscal reporting period.

Minnesota Army National Guard (MNARNG) –

MNARNG facilities are located throughout the state of Minnesota in approximately 80 locations, including Camp Ripley and the Arden Hills Area Training Site. The MNARNG 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 MNARNG throughout the state.

Minnesota Pollution Control Agency (MPCA) –

The Minnesota Pollution Control Agency (MPCA) has approximately 1,000 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.

Minnesota State Colleges and Universities (MnSCU)

Alexandria Technical College – Alexandria Technical College (ATC) employs approximately 250 faculty and staff members at two locations; the main campus and also the Interior Design facility, which is located off campus. The campus consists of seven staffed buildings, 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.

Bemidji State University (BSU) – BSU employs 649 faculty and staff, and 603 student employees. It has two staffed facility locations: BSU main campus and Center for Research and Innovation. All BSU facilities are included in this report.

Members of administration, faculty, staff, and students participated in several National Wildlife Campus Ecology teleconferences focusing on climate action topics, such as greener purchasing and transportation, conducting greenhouse gas inventories, and more. Teleconferences attended in FY 2007 included:

- How to Engage Students and Gain Support from the Administration: October 26, 2006
- Greener Purchasing on Campus: November 16, 2006
- Conducting GHG Inventories on Campus and Other Energy Tracking Strategies: Dec 7, 2006
- Greener Transportation on Campus: February 15, 2007
- Purchasing Green Tags and Renewable Energy Certificates: March 8, 2007

The Department of Residential Life also sponsored a web conference, Deploying Green Residential Facilities, which took place in parts on two days, 2/13/2007 and 2/15/2007.

Central Lakes College (CLC) – 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 employees approximately 400 full-time and part-time faculty and staff. Employees did not receive any formal P2 training in the past year.

Century College – Century College Campus covers 160 acres in Mahtomedi and White Bear Lake. The college employs approximately 700 faculty and staff, providing a wide range of technical and general education programs at three operating locations. This summary covers all operating locations.

Hennepin Technical College (HTC) – Hennepin Technical College employs approximately 600 faculty and staff at our two campuses in Brooklyn Park and Eden Prairie, plus our customized training offices in Plymouth and Bloomington. This report will cover the activities at our two campuses. Employees did not receive any formal P2 training in the past year.

Minneapolis Community and Technical College – Approximately 800 employees work at the four Minneapolis Community & Technical College (MCTC) 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 Employee Right to Know, Hazardous Waste and Laboratory Safety Training.

Minnesota State University, Moorhead (MSUM) – Minnesota State University Moorhead currently employs approximately 325 full-time faculty, 150 part-time faculty, and 325 staff members. These employees serve an enrollment of over 7,660 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 on going throughout the year for faculty, staff, and students with respect to pollution prevention, waste reduction, and recycling.

North Hennepin Community College – North Hennepin Community College has approximately 360 faculty and staff work at our agency. We have two locations: North Hennepin Community College Brooklyn Park campus, plus off-campus classes at Buffalo High School in Buffalo. We are reporting only for North Hennepin Community College Brooklyn Park campus. P2 training is required of Plant Services staff and is voluntary on part of other staff.

Riverland Community College – Riverland Community College has three campuses in two cities located in southern Minnesota: one in Albert Lea and two in Austin. We also have an outreach site in Owatonna. This report is for all four sites. The college employees approximately 300 full-time and part-time faculty and staff. There has been no formal pollution prevention training to the staff.

St. Cloud State University (SCSU) – St. Cloud State University 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. The university terminated its contract with MacNeil Environmental Inc. in 2006. Following other MNSCU campuses, the university now has an in-house Safety and Health Administrator.

St. Cloud Technical College – St. Cloud Technical College is located at 1540 Northway Dr. in St. Cloud and has approximately 206 staff. This report is for St. Cloud Technical College only.

Department of Transportation (Mn/DOT) – The Minnesota Department of Transportation has approximately 4,500 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 5,000 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 employs 31,978, which includes part-time and student employees, and has 66,099 students, which includes part-time students.

The University of Minnesota has 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). The University of Minnesota Rochester operates the University Center Rochester in cooperation with MNSCU. The university has approximately 22 experiment or research stations, 18 regional extension centers, and extension offices in all of the 87 counties in Minnesota. The university has approximately 50 EPA ID numbers for hazardous waste generator sites around the State of Minnesota. Total managed building 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 have received pollution prevention training during the past year.

Part 2
Policy and Regulatory Activities

Department of Administration (Admin) – Leadership in environmental stewardship is manifested in the mission statements of PMD and MMD. PMD employees are directed to use resource conservation and pollution prevention practices:

- In the maintenance of buildings and grounds
- In support operations
- During daily service to customers

The RRP developed the department's priorities for Environmental Materials Management. These priorities have been in effect since their adoption in 1991 (see Part 4). Public employees learn about them during purchasing training.

The department's focus on environmental partnerships during the past decade has helped it to:

- Leverage resources
- Reduce pollution
- Contribute to a more sustainable quality of life

Included in the Administration's pollution prevention activities are:

- Admin treats pollution prevention as a top priority in its Policy on Environmental Materials Management and its Priorities for Environmental Materials Management (Exhibit 1).
- PMD's Mission Statement encompasses pollution prevention and other environmental concepts (Exhibit 2).
- RRP encourages pollution prevention and promotion of preferred waste management practices contained in Minnesota Statutes § Section 155A.02 during the acquisition, use, maintenance, and discarding of materials.
- Admin requires that employees be held individually accountable for achieving environmental stewardship as a function of their job responsibilities and as a fulfillment of their position descriptions. Employees are directed to follow state and federal requirements and are asked to identify opportunities to implement environmental values.
- PMD includes language in lease agreements to provide both purge days and coordination services for each building on the Capitol Complex. This activity promotes recycling, reuse, and the correct disposal of hazardous materials.
- MMD requires vendors to provide environmental codes on the goods and services they make available for state purchase.

Real Estate and Construction Services (RECS) publishes and maintains *Sustainable Design Guidelines* on their web and encourages all agencies to use on building construction projects. In addition, RECS manages the Buildings, Benchmarks and Beyond (B3) Program, which includes creating and updating guidelines mandated for use on new buildings.

Real Estate and Construction Services (RECS) includes terms and conditions in lease agreements requiring landlords to follow *Sustainable Building Guidelines* when feasible, to provide recycling services and space, to comply with ventilation and environmental quality provisions, and to comply with all applicable laws, statutes, rules, ordinances, and regulations regarding pollution control and recyclable materials.

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 its cleaning contract, and also by sending out a directive to all purchasing agents within the agency. For more information, see Part 4 under *Cleaning Supplies*. The department also made a commitment to reduce state energy use through purchasing energy-efficient office equipment and appliances. Refer to Part 3, item d. for more information on how this is being accomplished.

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 Biodiesel Task Force continually works to accelerate the development of Minnesota's biodiesel 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. The 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. MDA continually uses both electronic communication and teleconferencing to communicate with its clients.

Department of Commerce

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

E85 STATION AND CONSUMPTION DATA

Year	Stations	Total (gallons/year)	Station average (gallons per month)
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	2,185,905	2,335
2004	101	2,611,218	2,270
2005	179	8,102,129	4,650
2006	290	18,058,365	6,133
2007*	306	9,953,424	5,530

*** through June 2007**

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. 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.

> *Oak Park Heights* facility's procurement process is a 90% paperless system, using electronic signature program. Teleconferencing is encouraged at the facility. There are over 200 teleconferences per year for staff training, staff meetings, and offender hearings.

Department of Employee Relations (DOER) – DOER has continued 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 lists the policies and procedures included in our agency's manual to promote pollution prevention efforts:

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.

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 *Water Cooler*, an 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 takes 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 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 maintain or obtain compliance with existing regulations associated with airport activities for both MAC and airport tenants. The MAC also uses the services of the Metropolitan Council Environmental Services for treating glycol-impacted stormwater.

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 Mosquito Control District (MMCD) – The Metropolitan Mosquito Control District is committed to protecting the environment. It's the district's policy 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 operate in strict compliance with federal, state, and local environmental laws. Meeting this commitment requires the cooperative effort of all MMCD employees. Technologies and methods that substitute nonhazardous materials and use other source reduction approaches will be given top priority for integration into MMCD operations.

Minnesota Army National Guard (MNARNG)– The MNARNG's vision is to lead the way in protecting and enhancing our natural and cultural resources while maintaining the highest degree of military readiness. The MNARNG 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 MNARNG 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) – The Prevention and Assistance Division concentrates on pollution prevention policy and outreach. Pollution prevention programs in Minnesota have had a distinct advantage over many other states by having stable, well-funded programs for the past 10 years. The Toxic Release Inventory and other data sources have shown a decrease in emissions and waste generation.

A whole host of information and tools are available that expand our original pollution prevention vision, including environmentally preferable purchasing, green buildings and design for the environment. Prevention and Assistance Division programs promote all these initiatives. The Minnesota Technical Assistance Program also uses these tools in their assistance to Minnesota businesses. (For details on these programs and accomplishments, refer to the MPCA *2008 Pollution Prevention Evaluation Report.*)

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 fosters energy efficiency by using the implementation of environmentally friendly products and waste stream reduction programs, both internally and with our vendor partners. ATC finds audio and video conferencing, online employee education products, and electronic transfer of reports and data to be energy- and time-efficient processes that reduce our energy and consumable product consumption.

Bemidji State University (BSU) – Bemidji State University has established an environmental policy statement that 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.

The complete statement can be viewed at www.bemidjistate.edu/ehs/content/bsu_env_plcy.pdf. As a 2005 signatory of the Talloires Declaration (http://www.ulsf.org/programs_talloires.html), BSU has made a formal

commitment to protect the environment and to pursue an environmental agenda.

Century College is in the process of implementing a Mercury Free Project to greatly reduce the use of mercury and mercury products on the campus. Over three kilos of mercury were removed last year, and the college continues to replace mercury instruments with non-mercury equipment.

Century College formed the R3 committee (Reduce, Reuse, Recycle) that meets several times per year. This committee monitors recycling and environmental initiatives. The committee has a prominently displayed bulletin board that educates viewers. This committee is in the process of establishing a link within the college website and promotes reduction and responsible handling of waste products.

All staff and students have an e-mail address to reduce paper memorandums. The college continues to expand its online learning, class registrations, and other transactions to paperless methods. Century College spent over $5,000 on recycling containers in Fiscal Year 2007. Furthermore, it has purchased two baling machines to compact cardboard and has two student workers working 20 hours per week on recycling collection. The college's fitness center and cardio rooms use a foam-based hand sanitizer, which does not require the use of paper or electric blowers to dry hands.

Hennepin Technical College (HTC) established an electronic invoice approval process and has expanded its use of video conferencing as a conscious effort to reduce travel between campuses for meetings. The college uses online work orders for both the Maintenance and IT departments. We are investigating the use of single-source recycling for all of our recyclable materials.

Minneapolis Community and Technical College (MCTC) – In order to regulate pollution prevention, we have updated our Chemical Hygiene plan to control chemical procurement, reduced waste streams, and reduced our hazardous waste generation to a Very Small Quantity Generator. Building and Hazardous Waste Inspections are completed weekly to ensure compliance. This year, we added the Stormwater Pollution Prevention Program to MCTC to spread awareness about pollution prevention and reduction. We have also eliminated a waste stream in our Media Production area as they have gone digital.

Minnesota State University, 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, electronic 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, conserve energy, and properly dispose of unwanted materials. MSUM currently reduces paper volume by using campus e-mail, promoting teleconferencing, using podcasting and vodcasting, 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.

North Hennepin Technical College – We have identified the waste generating sources on campus, and evaluated the waste stream from these sources. Plans have been developed and implemented to separate recyclable/recoverable items in these waste streams to make better use of our resources. Recyclable items like aluminum, glass, cardboard, etc. have been recycled for several years here on campus.

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% minimum total recycled content and 30% post-consumer fiber content. Bath tissue is 95% or more recycled/post consumer fiber.

St. Cloud Technical College – 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 whenever possible. High-efficiency office equipment is purchased whenever possible.

Pollution prevention activities in the past year include ongoing programs and practices that deal directly with the areas checked in the matrix at the end of this report. We have programs to recycle, reuse, or substitute, when possible, the chemicals and materials used on the campus that may pollute the environment.

Department of Transportation (Mn/DOT) is committed to lowering its waste disposal costs and liability, and protecting the environment. In keeping with this commitment, we strive to use cost-effective and practical methods to 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 use of alternative products.
- 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 coordinates implementation of the 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.** Seven agencies committed to this activity.

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

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

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

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

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.** Five agencies committed to this.

g. **Employ landscaping that reduces the need for gasoline-powered maintenance equipment.** Some colleges within the Minnesota State Colleges and Universities system and the Iron Range Resources and Rehabilitation Agency committed to this activity.

h. **Purchase electricity generated from renewable sources.** The University of Minnesota in Morris committed to using wind power generation. Meanwhile, several agencies have reported quantifiable savings due to the agencies' purchase of renewable electricity.

The total quantities of reductions in all the agencies are summarized in the 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.

As shown in the table, agencies achieved the greatest total reductions by encouraging staff to choose alternatives to single-occupancy vehicle commuting, followed by agencies purchasing renewable electricity. Energy conservation efforts and savings resulting from purchasing more efficient office equipment have been difficult to quantify, and 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. Reporting these quantities will improve in future years.

Minnesota state government agencies more than doubled their use of E85 fuel in 2007, according to figures released today by the Department of Administration. State agencies last year purchased 412,483 gallons of E85 from retailers, nearly a 250% increase over the 165,526 gallons bought in 2006. Their data also show that agencies purchased 7.5% of E85 of its overall fuel purchases for calendar year 2007. This is a 4.3% increase over E85 fuel purchase in calendar year 2006.

STATE AGENCIES REDUCTION TOTAL FOR FY 2007

Action	Total emissions reductions (lb)							
	CO	CO_2	Hg	NOX	PM10	PM2.5	SO2	VOC
a. Diesel vehicles	0	0	0	0	0	0	0	0
b. Gasoline vehicles	20,363	64,819	0	2,440	8	4	101	1,724
c. Commuter*	63,764	1,719,61	0	4,360	101	47	34.15	3,859
d. EE office equipment	10,620	3	19,528	0	43	4	3	78
e. Energy conservation	159	941,568	0	2,070	188	144	3,714	20
f. Low-VOC products	0	0	0	0	0	0	0	0
g. Landscaping	246	445	0	1	1	1	0	7
h. Renewable electricity	230	1,440,414	0	3,202	291	223	5,783	30
Agencies total	**95,382**	**4,166,861**	**19,528**	**12,073**	**632**	**423**	**9,635**	**5,718**

*Total MetroPass commuter data compiled altogether. Individual agency calculations not available. (Based on 2005 assumptions.)

All Agency Paper Use	Virgin	30% PC Recycled	100% PC Recycled	Total (reams)
Department of Administration	320	16,240	1,380	17,940
Department of Agriculture	0	5,910	0	5,910
Department of Commerce	10	6,910	0	6,920
Department of Corrections	0	51,749	0	51,749
Department of Employee Relations	0	3,610	0	3,610
Dept. of Employment and Economic Development	5,198	33,019	0	38,217
Iron Range Resources	320	907	0	1,227
Metropolitan Airports Commission	5,610	1,230	0	6,840
Met. Council Environmental Services (CY 2006)	2,667	11,609	0	14,276
Metropolitan Mosquito Control District		800*		800*
Department of Military Affairs	0	446	0	446
Minnesota Pollution Control Agency	0	1,380	10,211	11,591
Minnesota State Colleges and Universities	1,828	11,433	240	13,501
Central Lakes College	0	1	0	1
Riverland Community	8,130	4	1	8,135
Bemidji	6,430	5,400	3,600	15,430
Hennepin Technical College	0	130	16	146
Minneapolis Community & Tech College	0	8	0	8
St. Cloud Tech	0	8	0	8
St. Cloud State	817	42,194	0	43,011
Department of Transportation	1,003	42,787	1,020	44,810
University of Minnesota	166,000	165,000	16,000	347.000
Total (reams)	**198,333**	**400,775**	**32,468**	**631,576**
Total (pounds)	**991,665**	**2,003,875**	**162,340**	**3,157,880**
Total (tons)	**496**	**1002**	**81**	**1,579**

***Contains 25% post-consumer content recycled paper.**

PaperCalculator.org

Lifecycle Environmental Impact

The following is a break down of the environmental impact of your choices for different grades of paper.

	FY07 Paper Purchases from OSC	FY08 Paper Purchases from OSC
Wood Use	2,928 tons	1,777 tons 1,151 tons less
Total Energy	40,352 million BTU's	33,125 million BTU's 7,227 million BTU's less
Purchased Energy	23,326 million BTU's	22,794 million BTU's 532 million BTU's less
Sulfur dioxide (SO_2)	31,415 pounds	29,258 pounds 2,157 pounds less
Greenhouse Gases	6,120,825 lbs CO_2 equiv.	5,143,089 lbs CO_2 equiv. 977,736 lbs CO_2 equiv. less
Nitrogen oxides (NOx)	20,845 pounds	18,399 pounds 2,446 pounds less
Particulates	13,197 pounds	10,938 pounds 2,259 pounds less
Hazardous Air Pollutants (HAP)	1,872 pounds	1,196 pounds 676 pounds less
Volatile Organic Compounds (VOCs)	5,366 pounds	3,984 pounds 1,381 pounds less
Total Reduced Sulfur (TRS)	287 pounds	174 pounds 113 pounds less
Wastewater	19,900,972 gallons	16,194,685 gallons 3,706,287 gallons less
Biochemical Oxygen Demand (BOD)	7,535 pounds	6,990 pounds 545 pounds less
Total Suspended Solids (TSS)	11,100 pounds	9,488 pounds 1,612 pounds less
Chemical Oxygen Demand (COD)	87,620 pounds	64,177 pounds 23,443 pounds less
Adsorbable organic halogens (AOX)	788 pounds	478 pounds 310 pounds less
Solid Waste	2,348,161 pounds	1,885,486 pounds 462,675 pounds less

Display data as chart

Explanation of Data Values

The Paper Calculator is based on research done by the Paper Task Force, a peer-reviewed study of the lifecycle environmental impacts of paper production and disposal.

Wood Use

Wood use measures the amount of wood required to produce a given amount of paper. The number of typical trees assumes a mix of hardwoods and softwoods 6-8" in diameter and 40' tall. Calculated collaboratively by Conservatree and Environmental Defense based on data from Tom Soder, Pulp & Paper Technology Program, University of Maine, as reported in Recycled Papers: The Essential Guide, by Claudia G. Thompson, The MIT Press, 1992.

- The FY07 Paper Purchases from OSC uses 2,928 tons , the equivalent of about 20,271 trees
- FY08 Paper Purchases from OSC would use/produce 1,151 tons less , the equivalent of about trees

Total Energy

Total energy consumption measures all the energy, including electricity and all forms of fuels, consumed to produce a given amount of paper. The unit of measure is British Thermal Units (BTUs). The average U.S. household uses 91 million BTUs of energy in a year

- The FY07 Paper Purchases from OSC uses 40,352 million BTU's , the equivalent of about 443 homes/year
- FY08 Paper Purchases from OSC would use/produce 7,227 million BTU's less , the equivalent of about homes/year

Purchased Energy

A subset of total energy, purchased energy measures how much energy comes from purchased electricity and other fuels. The unit of measure is British Thermal Units (BTUs). The average U.S. household uses 91 million BTUs of energy in a year

Department of Administration

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, grounds, janitorial, materials transfer, parking, administration of the state resource recovery program, special use of state facilities permits, and central mail.

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.

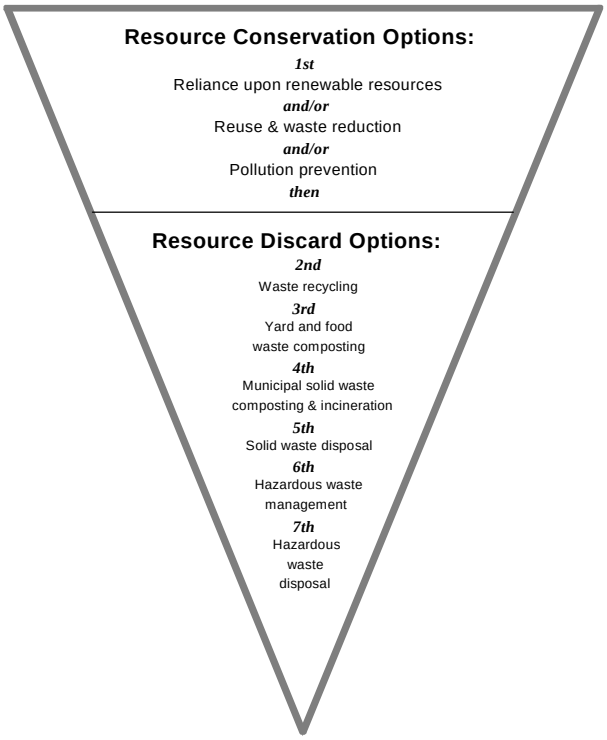
Responsiveness to our customer needs through communication, efficiency, and timeliness.

Provide quality work through modern technology and employee training.

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

Minnesota Department of Administration
Priorities for Environmental Materials Management

The acquisition, use, maintenance and discard of materials should first maximize resource conservation options to avoid and reduce waste quantity and volume. Then, resource discard options should be maximized in the order of priority.



a

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.

Department of Agriculture

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

Prior to the move into the new building the Minnesota Department of Agriculture had surplused/consolidated all office equipment (copiers, printers, fax machines, etc.) it had in the old facility. The new facility employs an open office/neighborhood center concept of office equipment usage. Instead of having office equipment stationed at multiple locations (private offices) throughout the building, most office equipment is centrally located in the neighborhood centers. There is 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. As a result of this transition, newer, more energy-efficient office equipment was purchased during fiscal year 2006 to be placed in the new facility.

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 (Plant Management). However, prior to moving into the new facility, the department had finalized a contract with Admin's Plant

Management Division to provide cleaning/janitorial services for our agency. The terms of the contract are:

"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.

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.

Department of Commerce	Diesel	E85	Unleaded
Fuel purchases – FY06 (gallons)	15,899	1,423	35,339
Fuel purchases – FY07 (gallons)	17,126	1,760	37,335

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. For FY 06, the number of employees who use a Metropass or car pool has increased (see part 4, item 10). Bike racks are also available near the building.

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

The department completed its multi-year effort to replace CRT computer monitors with flat screen LCD devices. 60 units were replaced in FY 06 saving an estimated 10,620 kWh/yr (60 monitors x 177 kWh/yr/monitor). Because the monitors emit less heat, the building's cooling cost during the summer peak will also be reduced.

Action	**Total emissions reduction (pounds)**							
	CO	**CO2**	**Hg**	**NOX**	**PM10**	**PM2.5**	**SO2**	**VOC**
EE office equipment	10,620	3.112	19,528.375	0	43.415	3.940	3.027	78.407
Total	10,620	3.112	19,528.375	0	43.415	3.940	3.027	78.407

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.**

See Part 4, section 6, *Automotive Fuels*.

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.

See Part 4, section 9, *Cleaning Supplies*. The department's paper consumption summary appears in Part 4, section 22, *Office Supplies*.

MCF-Oak Park Heights used 3,000 reams of 30% post consumer content. Associated energy, greenhouse

gas, and other environmental impacts are indicated here:

Action	Baseline-Target	
Wood use	134 tons	929 trees
Total energy	647 million BTUs	7 homes/year
Purchased energy	-134 million BTUs	-1 home/year
Sulfur dioxide (SO2)	21 pounds	4 18-wheelers/year
Greenhouse gases	81,583 lbs CO2 equiv	7 cars/year
Nitrogen oxides (NOx)	155 pounds	<1 18-wheeler/year
Particulates	197 pounds	18 buses/year
Total reduced sulfur (TRS)	13 pounds	
Wastewater	338,633 gallons	<1 swimming pool
Biochemical oxygen demand (BOD	9 pounds	<1 home/year
Total suspended solids (TSS)	126 pounds	<1 home/year
Chemical oxygen demand (COD)	2,482 pounds	5 homes/year
Solid waste	43,485 pounds	2 garbage trucks

Source: Environmental impact estimates were made using the Environmental Defense Paper Calculator. For more information visit http://www.papercalculator.org

DOCorrections	CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
Energy Conservation	11.80	17,596.19	0.00	15.99	1.24	1.20	3.92	0.78
Total	11.80	17,596.19	0.00	15.99	1.24	1.20	3.92	0.78

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 FY2007, DOER continued implementation of our computer monitor power management policy. By the end of FY2007, 60 to 70% of the computer monitors within the department have been configured to turn off the monitor after 10 minutes of inactivity (up from 50% in FY2006). It is reported by Energy Star that computer monitors set to sleep mode after 10 minutes save an annual estimated 200kWhr/monitor (http://www.energystar.gov/index.cfm?c=power_mgt.pr_power_manage_reps).

All office equipment purchased/leased during FY2007 was Energy Star compliant. In FY 2007, DOER has replaced 75 CRT monitors with LCD monitors. DOER only purchased paper with recycled content in FY2007. The breakdown of paper type purchased is as follows:

FY 2007 OFFICE PAPER CONSUMPTION	
30% RC Copy Paper, PCF	3,610 reams

DOER	CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
Energy Conservation	2.05	12,871.81	0.00	28.62	2.60	2.00	51.68	0.27
Total	2.05	12,871.81	0.00	28.62	2.60	2.00	51.68	0.27

Department of Employment and Economic Development (DEED) – The following lists the commitments 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.

The Department also commits to reduce paper consumption.

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

- Replacing light bulbs with energy-efficient lamps.
- Leasing Toshiba e-studio copy machines, and all copiers have the Energy Star label on them.
- Landscaping projects reclaim lands back to their 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.

To help further measure energy-conserving practices, a baseline regarding energy consumption has been established for the facilities owned by Iron Range Resources. This information contains the usage of electricity, gas, and water for FY07 at Giants Ridge, Eveleth Administration Building, and the Mining and Reclamation headquarters. Ironworld data was not included in the FY07 report as this facility is no longer operated by the agency.

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.

Staff identified new vehicle purchases that are capable of being alternative fuel compatible. This will allow MAC to use E85 or other available clean fuel options or technologies.

b. Refuel vehicles with the cleanest fuel available.

MAC staff will transition to biodiesel in existing diesel-powered equipment, which does not require any modifications to the equipment or to fueling tanks. MAC's flexible fuel vehicles will be limited to using only E85. E85 pumps, meters, and a fuel storage tank have been installed on-site for use by MAC vehicles.

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%. New chillers consume 33% less energy. Other energy-saving activities include strategic seasonal temperature adjustments and reuse of steam for preheating boilers and powering water pumps. MAC also 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 12 dual fuel vehicles, but only two are 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*. MCES does not participate in centralized materials management and resources tracking as provided to other state agencies by the Department of Administration's Fleet Management or Central Stores.

MCES	CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
Gasoline Vehicles	372.00	-12,517.00	0.00	625.00	-0.74	-0.64	2.35	369.00
Total	372.00	-12,517.00	0.00	625.00	-0.74	-0.64	2.37	369.00

Minnesota Army National Guard (MNARNG)– The MNARNG has selected to implement two air quality pollution prevention actions.

b. Refuel MNARNG equipment with the cleanest fuel available.

The MNARNG has a fleet of vehicles available for state employee usage located at Camp Ripley. These vehicles are driven all across the state. Until recently, gasoline stations did not distinguish between E85 and unleaded fuels on their receipts. Therefore, E85 usage numbers were not accurately captured. According to Tim Morse of Administration, this problem has been fixed and numbers will be accurately reflected in the future. To ensure that accurate numbers are captured, drivers are now required to record type of fuel purchased on the receipt.

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%.

Most of the major projects described 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 at facilities located across the state. 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.

Minnesota Pollution Control Agency (MPCA) – The MPCA selected items a. through f. and h. 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 MPCA has 156 vehicles, of which 97 are flex-fuel vehicles and 10 are alternative vehicles. MPCA has representation on the SmartFleet and Drive to Excellence committees coordinated by the Department of Administration.

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

Currently, the MPCA is using 25.5% E85 fuel compared to 7.5% in 2005 and 14.5% in 2006.

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

Refer to Part 4, item 10. p.3, *Commuting and Transportation*

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

See Part 4, item 12, p.3, *Electronics* below for details.

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

The MPCA's goal is to provide a reasonable, comfortable working environment while meeting the Governor's Executive Order #5-16 to reduce energy consumption. At the St. Paul central office, the landlord implemented a program to selectively turn off the heat pumps at certain times. The fans remained on, circulating already-cooled air throughout the building. This is similar to the "Saver's Switch" program offered by Xcel Energy.

MPCA also purchased and installed seven VendingMisers, a cold drink and snack vending machine energy conservation tool. Tests showed that the VendingMiser produces a 41% energy savings annually.

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 MPCA'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. Also, the fifth floor was re-carpeted using recycled-content carpet squares and W.F. Taylor 2027 adhesive, which is certified with the CRI Green Label Plus. The old carpet was given to Bro-Tex One, a national carpet maker, to make into pellets.

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

h. Purchase electricity generated from renewable sources.

The MPCA has an agreement with the lessor to purchase $27,000 worth of windsource for three years (450,000 kWh per year) beginning in September 2006. Any fuel cost adjustment rebates will be re-applied toward additional windsource purchases. This will result in the annual prevention of 828,000 pounds of carbon dioxide, 2,490 pounds of sulfur dioxide, 1,790 pounds of nitrogen oxides, and 9 grams of mercury to the atmosphere. The MPCA's lessor, Meritex, received $6,905 in rebates from Xcel Energy from November 2006 to May 2008, which have been or will be applied to future windsource purchases as specified in the lease amendment with Meritex.

In addition, the Brainerd regional office purchases 100% wind-source power through Crow Wing Electric.

MPCA	CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
Renewable electricity	131.85	827,473.50	0.02	1,839.60	166.95	128.25	3,322.35	17.10
Total	131.85	827,473.50	0.02	1,839.60	166.95	128.25	3,322.35	17.10

Minnesota State Colleges and Universities (MnSCU)

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

Central Lakes College (CLC) – 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 use E85 fuel.

Century College – Campus Security has replaced one of their department vehicles with a smaller more fuel-efficient Chevy Malibu, which will save an estimated 260 gallons of gas per year.

Riverland Community College – The college leases vehicles from Travel Management for each building's use and our Farm Management program. We are using E85 fuel or vehicles with a 30 to 35 mpg rating.

St. Cloud Technical College – We lease our vehicles from Travel Management Division; what they purchase is what we use.

St. Cloud State University – SCSU is focused on purchasing/leasing the most fuel-efficient and least polluting vehicles that meet our operational needs. We've gone from 18 E85 capable motor pool vehicles to 20. E85 fuel usage for this fiscal year totals 24,098 gallons. All 15 passenger vans have been replaced with 12 passenger vans. Grounds Maintenance and Athletic Departments are also experimenting with golf cart sized/type vehicles. 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).

Alexandria Technical College– Alexandria Technical College currently participates in the state vehicle lease program. Our current fleet of leased vehicles has been upgraded to include more fuel-efficient vehicles.

North Hennepin Technical College (HTC) – Hennepin Technical College does not have any quantifiable measurements, but we have committed to the following activities: HTC didn't purchase any fleet vehicles the past 12 months, but the vehicles we own were the most fuel-efficient available at the time of purchase that met our operational needs. Employees are encouraged to use video conferencing as an alternative to driving to intercampus meetings and to ride-share whenever possible. We also maintain a lease arrangement with a local vehicle rental agency that allows us to obtain more fuel-efficient vehicles for travel that involves only a few users/travelers.

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

Century College purchases approximately 5,000 gallons 10% ethanol gasoline per year for on-campus vehicles.

Hennepin Technical College refuels our vehicles with the cleanest fuel available.

Riverland Community College – 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 2005, our Truck

Driving program began using bio-diesel fuel (less than 500 parts of sulfur per million) in 45% of its trucks, compared to using regular diesel fuel that is 1,300 parts of sulfur per million. This year, we are using it in 100% of our trucks.

St. Cloud Technical College – We refuel our leased vehicles with the fuel recommended by Travel Management Division; they are refueled with the cleanest fuel available.

St. Cloud State University– SCSU is promoting E85 usage also by making campus refueling with it more convenient. This is in addition to two more E85 vehicles as described above.

Alexandria Technical College – ATC has eliminated vehicles from their fleet to reduce fleet capacity of fuel inefficient vehicles.

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

Central Lakes College encourages our employees to car pool 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.

Century College has added two bus stop shelters to promote mass transit commuting in 2007. Students may purchase discounted bus fares for the semester through the College Connection, a discount purchasing store. The Connection also has an "I Need a Passenger" rideshare bulletin board system. Furthermore, Century maintains a bridge between the East and West Campus, which reduces vehicular commuting between the East and West Campuses.

Riverland Community College – Currently, Riverland encourages our employees to car pool as an alternative to single-occupancy vehicle commuting. Last year, we requested departments report monthly the number of miles they are carpooling and how many are participating. Employees are encouraged to have teleconference meetings between the campuses whenever possible to cut down on travel. Over the past year (2007), we have seen a lot more carpooling efforts. The logs show two to five employees carpooling over 5,000 miles together. We will continue to encourage this and hope to see a rise in logging the miles. It is difficult to get everyone to submit logs.

St. Cloud Technical College – While faculty and staff are on college business, carpooling is encouraged and practiced.

St. Cloud State University – SCSU encourages employees and students to consider alternatives to single-occupancy commuting by co-sponsoring free bus rides with St. Cloud Metropolitan Transit Commission (MTC). Ride shares and car pools are also encouraged and promoted.

North Hennepin Community College – We are developing a message board to allow employees to more easily coordinate car pooling. We plan to have this message board accessible from our college web site. We maintain one 12-passenger van for use by our instructor/student groups for field trips, etc., as well as a pickup and flat-bed truck that are primarily used for on-campus work and to pick up equipment from suppliers.

Minneapolis Community and Technical College – MCTC is continuing the activities from 2005 and 2006. This year we received an additional 50 bike racks.

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

Century College – The college purchases only Energy Star rated computers and LCD panels. Computer settings are optimized to take advantage of energy-reducing capabilities.

Hennepin Technical College is reducing energy use by purchasing energy-efficient office equipment and appliances including continued replacement of CRT computer monitors with low energy-consuming LCD flat-screen monitors.

St. Cloud Technical College uses 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 conserves electricity.

The new addition is equipped with energy efficient equipment and includes:

- Office and classroom occupancy sensor lighting controls
- Alternative classroom and office lighting designs
- Premium efficiency supply/return fan motors
- CO_2 control of outside air
- Lo E clear2/alum frame windows
- R25 roof insulation
- R16 wall insulation

St. Cloud State University – 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. As is 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.

Alexandria Technical College – 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.

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

Bemidji State University – BSU continued an ongoing program of replacing T-12 fluorescent lights and ballasts and incandescent lights with T-8 high-efficiency lamps and electronic ballasts and compact fluorescent lighting. During FY 2007, the replacements resulted in a net reduction of approximately 11,662 watts of lighting. This will reduce electrical energy consumption by about 60,600 kWh. BSU also received a rebate of $6,500 for the project through Otter Tail Power Company's participation in the Minnesota Conservation Improvement program (CIP).

Potential estimated emissions reductions (pounds)							
CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
17.768	111,510.329	0.003	188.048	22.498	17.83	447.720	2.304

The second phase of construction of an addition to the Industrial Technology building included installation of five energy recovery wheels as part of the ventilation system. The devices are expected to reduce energy consumption by an estimated 140, 000 kWh. The estimated potential emissions reductions are:

Potential estimated emissions reductions (pounds)							
CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
41.020	257,436.2	0.006	572.32	51.940	39.9	1,033.62	5.32

Bemidji State University continues to purchase 61,600 kWh/month of wind-generated electricity for $1.60 per 100 kWh block above the standard rate. The university is planning to purchase additional wind energy blocks. The wind-generated electricity reduces annual emissions by approximately the following amounts:

Annual reduction (lb)							
CO	CO_2	Hg	NOx	PM10	PM2.5	SO_2	VOC
216.586	1,359,263.136	0.032	3,021.850	274.243	210.672	5,457.514	28.090

BSU continued an on-going 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. 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.

Central Lakes College (CLC)– We are working with the U.S. Energy Services to purchase fuels at a lower cost to the college. We have an agreement with our local utilities to curtail our electricity and natural gas. We have a propane back-up system at Brainerd that we use when asked by the local utilities. Staples campus has a 1,000 gallon fuel oil reserve. We have completed energy savings project at both the Staples and Brainerd campuses. All lighting is now T8, and classrooms and bathrooms have motion sensors installed.

Century College has eliminated two hydronic Kewani 165 hp boilers from the West Campus. The college now uses the East Campus boilers to heat both campuses, which results in greater efficiency. Note: a 99% efficient Fulton PulsePak hydronic boiler was installed on the West Campus to assist with building warm-up and temperature control. Century also follows state guidelines for building temperatures.

Hennepin Technical College employs energy-conserving strategies in its buildings through its continued use of computer-controlled HVAC systems for lab, classroom, and office areas. The original cooling system (30+ years old) at our Eden Prairie Campus was replaced with the most energy-efficient available.

St. Cloud Technical College uses 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 conserves electricity. The new addition is equipped with energy-efficient equipment and includes:

- Office and classroom occupancy sensor lighting controls
- Alternative classroom and office lighting designs
- Premium efficiency supply/return fan motors
- CO_2 control of outside air
- Lo E clear2/alum frame windows
- R25 roof insulation
- R16 wall insulation

St. Cloud State University (SCSU) employs energy-conserving strategies in our buildings. For instance, Centennial Hall renovation has been completed 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.

Alexandria Technical College – New energy-efficient roof-mounted HVAC replacement systems have been installed during the reporting period. Energy conservation strategies have been a major focus for ATC's Facilities and Maintenance Department. Our continuous energy conservation program includes winterizing all overhead and exterior doors each fall and replacing T-12 fluorescent lighting with a T-8 fixture. The T-8 fixture is 30% more energy efficient than the T-12 model. Our team has replaced one-half 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. A company was contracted to calibrate and tune up all of the heating system boilers during the reporting period.

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.

Century College – The majority of the paint that Century purchases is Harmoney and Duration, which are low VOC paints.

Riverland Community College – 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 Technical College –We continually review our products and use the most environmentally

friendly products available in our labs, classrooms, and maintenance area.

St. Cloud State University – SCSU actively procures cleaning and painting products based on potential air pollution. Bleach is being restricted. Surface wetting and liquid pump sprays are promoted over aerosols. VOCs are discouraged with a special review safety committee participation to ensure substitution or replacement. Latex paint is promoted; use of oil-based paint is very restricted.

Alexandria Technical College – Our Facilities Maintenance Department has converted most of its 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.

Minneapolis Community and Technical College is continuing to procure and use products with the lowest potential to contribute to air pollution. In addition to those in 2005 and 2006, we have procured the following: JD Stride Citrus HC 0 VOCs, JD Glance NA 0.1 VOCs, JD Crew Restroom Cleaner 0 VOCs, JD Plaza Sealer 20.26 VOCs, SP SparCling Bowl Cleaner 18.7 VOCs, SP Extraction II Carpet Cleaner 20.9 VOCs, SP Tough on Grease 0 VOCs, and SP Spraybuff 0 VOCs.

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

Central Lakes College (CLC) – 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.

Century College planted natural grasses in the vicinity of the bridge. The college also has wet land and wooded areas that are left in natural state.

Riverland Community College – The second commitment was to mow some areas of our campus less than usual. In Austin, approximately eight fewer acres are being mowed, which avoids about three hours of tractor use and five gallons of fuel per time). In Owatonna, four acres are prairie grasses that require very little mowing or care.

St. Cloud Technical College – Planting of trees and building expansion have reduced the need for use of gasoline-powered equipment and less mowing.

St. Cloud State University is experimenting with landscaping and prairie growth which reduces gasoline use.

Alexandria Technical College – Landscaping of newly developed areas employ xeriscaping designs to reduce the use of gasoline-powered maintenance equipment, fertilizers, and also to reduce fire hazards.

North Hennepin Community College maintains a small nature preserve area on campus of approximately five acres, which includes a stormwater holding pond planted with plants and grasses native to Minnesota. We plant wild prairie grass where practical on campus to reduce the amount of mowing needed in parking lot islands and other curb areas surrounding our parking lots.

h) Purchase electricity generated from renewable sources.

Minnesota State University, Moorhead – MSUM is actively participating in all eight areas of Minnesota Executive Order 04-08. However, 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 Activities during the fiscal year*.

St. Cloud State University still purchases wind-generated electricity provided through Xcel Energy. Investment is minimal to promote learning opportunities which will help balance higher cost. SCSU has purchased a diesel pickup which will burn vegetable oil from campus.

MNSCU	CO	CO_2	Hg	NOX	PM10	PM2.5	SO_2	VOC
Landscaping	245.89	445.45	0.00	1.26	0.76	0.69	0.09	7.08
Renewable electricity	97.67	612,940.88	0.01	1,362.66	123.67	95.00	2,460.99	12.67
Total	343.56	613,386.33	0.01	1,363.92	124.42	95.69	2,461.08	19.74

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**	**FY2006**
Total vehicles	795	830	835	833
E85 vehicles	42	38	71	81
E85 % of fleet	5.28	4.58	11.8	9.72
Hybrid vehicles	3	4	14	14
Gallons of E85 purchased	19,867	18,636	16,997	13,735

FY2007 the university's E85 fleet and tanks were used for a state-funded E20 test, so no E85 results are available for that year.

Alternative energy: Wind power. In March 2005, the university's WCROC (West Central Research and Outreach Center) began operating a 1.65MW wind turbine. This 2300-foot turbine provides the University of Minnesota-Morris with 5.6 million kilowatt hours of power each year—more than half of the University of Minnesota-Morris's annual electricity requirement, thereby cutting in half the coal burned to power the campus. The University of Minnesota-Morris use of wind-generated electricity dramatically reduces air pollution (5000 tons CO_2, 20 tons SO_2, 10 tons NOx, 1 ton CO per year).

DOT	**CO**	**CO_2**	**Hg**	**NOX**	**PM10**	**PM2.5**	**SO_2**	**VOC**
Gasoline Vehicles	3,283.90	99,127.40	0.00	173.10	6.70	3.10	98.70	2.00
Energy Conservation	145.20	911,099.80	0.02	2,025.50	183.80	141.20	3,658.10	18.80
Total	3,429.10	1,010,227.20	0.02	2,198.60	190.50	144.30	3,756.80	20.80

Part 4
Pollution Prevention Activities during the Fiscal Year 2007

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) – MMD, in conjunction with the Department of Transportation, has a contract for Hazardous Materials: Used Oil Sorbent and Filter Management for Energy Recovery. One contractor burns the burnable sorbents for energy recovery, while another 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 and reduce possible release.

MCF- Lino Lakes – Recovered 273 pounds of absorbents in FY 07 and will continue to look for ways to minimize this waste stream.-

Iron Range Resources and Rehabilitation Agency (IRRR) – Como Oil picks up floor-dry for recycling.

Metropolitan Airports Commission (MAC) continually evaluates a variety of absorbents. Currently, corncob fractions, clay floor-dry, and disposable rags are used to absorb oil and grease in the maintenance shop. Also, although 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. Spent absorbent materials are managed as non-hazardous industrial waste and burned for energy recovery. Absorbents are used to their full potential before disposal.

Metropolitan Council Environmental Services (MCES) – The primary products that are absorbed are 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 2006, 990 gallons of used absorbents were sent for energy recovery or recycling, an increase of five times over 2005.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – MSUM continues to use cloth-type pads and drip pans whenever possible. These absorbents are cloth-type rags, pads, and socks and are used primarily in Printing Services, Physical Plant, and Dept. of Art and Design. Launderable rags are available and used at some locations.

St. Cloud State University – 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.

Alexandria Technical College 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.

Department of Transportation (Mn/DOT) – The sorbents currently used are either burned for energy recovery as a waste-derived fuel to generate steam and electricity, or the oils are extracted and the sorbents are reused. Mn/DOT continues to use a small quantity of launderable rags as sorbent materials. 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 – Vehicle fleet operations use absorbent pads to clean up small routine spills, in place of and/or in combination with floor-dri. The pads are laundered and reused. Absorbent disposal has been cut by several (5 to 10) drums per year. Printing and Graphic Arts 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) – SAO specifies materials such as fiber-based fabrics, adhesives, carpeting, and upholstery that are free of toxins and formaldehyde.

Department of Corrections (DOC)

MCF-Red Wing – Contact cement usage is down in FY 2006 as a result of using less laminate material.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – MSUM continues to enforce 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 – 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.

Alexandria Technical College – 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.

North Hennepin Community College – Several types of adhesives are used at this college, primarily in our Arts and Plant Services departments. Every effort is made to properly control product and follow manufacturer recommendations to insure all adhesives are maintained so as to allow product to be completely used and not allowed to be wasted because of poor handling.

3. Air Quality, CFCs

Department of Administration (Admin) – SAO specifies statewide asbestos control programs based on federal and state standards. SAO specifies air quality standards. PMD 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 and is used by a certified staff person to reduce possible emissions. In addition, a crankcase ventilation filter system was installed on two diesel generators, helping to remove harmful contaminants prior to release to the environment.

MCF-Faribault – Switched to a cleaner burning fuel oil for use in its physical plant.

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.

Minnesota Army National Guard (MNARNG) personnel reclaim and reuse CFCs.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – All air handling units/heating systems and drains continue to be 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.

St. Cloud Technical College – 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. We recycle air conditioning refrigerants to keep them from entering the atmosphere because of the global warming issue.

St. Cloud State University – SCSU continues to go beyond recycling Freon.

Alexandria Technical College – 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.

North Hennepin Community College – Indoor air quality is a big interest item at this college. Air quality sampling continues to be performed on problem/suspect areas with corrective action taken to prevent future problems. In the past year mechanical upgrades to the air handling systems in two of our older buildings have been completed. These new higher efficiency air handling units will provide better air filtration, and increase the supply of fresh air to the interior spaces of these buildings.

CFC refrigerants are in use on campus in Central Plant chillers (R-134A), 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 more ozone friendly replacement refrigerant. This type of work is performed by qualified outside contractors.

Department of Transportation (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 during repairs.

University of Minnesota – In March 2005, WCROC began operating a 1.65MW wind turbine. This 230-foot turbine provides the University of Minnesota-Morris with 5.6 million kilowatt hours of power each year—more than half of University of Minnesota-Morris's annual electricity requirement thereby cutting in half the coal burned to power the campus. Of equal or greater interest is the wind turbine's potential to generate

additional energy sources and to provide a platform for this research. WCROC has received funds from the Legislative Commission on Minnesota Resources to institute a three-phase plan to demonstrate and conduct vital research in areas of stored wind energy with hydrogen, fuel mixing, and value-added products such as wind-produced fertilizer.

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 to 280 to 310 tpy, and carbon monoxide (CO) emissions from approximately 280 tpy to 130 to 150 tpy. Results vary depending on the ratio of fuel types used (gas, coal, 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% 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 energy consumption on the Twin Cities campus while maintaining or improving occupant comfort. Three components of the Energy Efficiency Program are:

- Optimum energy management
- Building system analysis, repair and upgrade
- 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 (BSAC), which can electronically monitor and control 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. They 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%, which translates to a 24.6% reduction in steam plant air emissions. Through energy optimization and the Energy Efficiency Program, overall energy consumption has decreased 17% 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 specializes in reducing diesel exhaust emissions from mobile and stationary engines, the physical and chemical characterization of exhaust emissions, evaluation of emission controls, evaluation and demonstration of alternative fuels, certification of on- and off-highway engines, and evaluation of control technology in the field (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.

University Facilities Management has an on-going program to capture and reclaim CFC and HCFC from cooling units. As a unit is serviced, its CFC/HCFC is captured, and then placed back in the unit after it is serviced. 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 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 avoidance of air pollution each year.

The University of Minnesota-Morris uses wind-generated electricity to dramatically reduce air pollution (5,000 tons CO_2, 20 tons SO_2, 10 tons NOx, 1 ton CO per year). With the heating plant modifications, there is a reduction of approximately 1,560 to 1,680 tpy of SO2, NOX, and CO emissions. Reduced energy usage requires less steam and electricity generation which means less pollution emitted to the air. Reduction of mobile diesel exhaust emissions makes for a cleaner and healthier air to breathe. CFC and HCFC capture and reclamation program reduces emissions of global warming chemicals.

4. Antifreeze

Department of Administration (Admin) – PMD completed the conversion of cooling coils at all Capitol Complex Buildings to prevent freeze-ups by using warm air from the air handlers rather than antifreeze. PMD collects and recycles antifreeze on a voluntary program. MMD has a contract to recycle used antifreeze (H-94(5)).

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.

Minnesota Army National Guard (MNARNG) – The MNARNG recycled in-house approximately 1,500 gallons of antifreeze last year.

Minnesota State Colleges and Universities (MnSCU)

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

St. Cloud Technical College recycles and reuses antifreeze to keep from polluting our environment.

St. Cloud State University– SCSU generates approximately 10 to 15 gallons of waste antifreeze per year, which is recycled at Eastside Oil Company.

Alexandria Technical College – 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.

North Hennepin Community 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) uses 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 12,000 hours, with the addition of an extender at 300,000 to 400,000 miles of on-road use (3 years or 6,000 hours of off-road use). Mn/DOT typically does not produce significant amounts of antifreeze. For example, if part of the coolant system needs to be changed, the old antifreeze is collected and stored while the repair is made, and then placed back into the vehicle.

Mn/DOT has researched, identified, and implemented various recycling options for antifreeze. However, due to the relatively high cost of current recycling options, 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 3 to 5 years. The small amount of antifreeze collected is periodically regenerated onsite by outside contractor.

5. Audits

Department of Corrections – Safety audits are conducted DOC-wide on a regular basis. In FY 08, an environmental section will be developed and added as a portion of regular audits.

MCF – Willow River/Moose Lake – Audits were performed by the Department of Energy for emissions and the DNR to evaluate water consumption.

*MCF-Lino Lakes c*onducted a Stormwater Pollution Prevention audit.

MCF-Shakopee - Center Point Energy completed a lighting audit in July 2007 and recommended the installation of more efficient lights with occupancy sensors. After work is completed, it is expected that energy use will be one-half the current level.

Metropolitan Airports Commission (MAC) – The MAC continues to conduct environmental compliance inspections at the six reliever airports in addition to environmental audits at the MSP airport. 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.

Minnesota Army National Guard (MNARNG) – Internal Performance Assessment System (IPAS) environmental audits are performed at MNARNG facilities. 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.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – The Department of Environmental Health and Safety and Physical Plant staff periodically conduct internal audits of university facilities. These audits cover such areas as hazardous waste, stormwater management, storage tanks, laboratory procedures, and energy consumption. Individual departments are also asked and encouraged to self-audit periodically.

St. Cloud State University– Ross Environmental Inc. performs environmental audit functions as part of their Environmental Health and Safety (EHS) contract with SCSU. The Safety Administrator is instrumental on 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. Survey 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.

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

Department of Transportation (Mn/DOT) – Mn/DOT conducts internal waste stream audits of Mn/DOT facilities. The purposes of these audits are to:

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

Mn/DOT annually conducts 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.

Economic and environmental benefits/costs: 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). However, staff reductions over the years have reduced MnDOT's capability to complete both internal and external audits.

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 include pollution prevention) and OSHA laboratory standard protocols in place. The Department of Environmental Health and Safety (DEHS) does targeted audits of large and/or noncompliant departments. DEHS also initiated chemical waste audits of all labs on the Twin Cities campus. All chemical waste generators are directed to minimize waste and encourage pollution prevention via training and self-audit.

The training and audit form is currently available on the web through the DEHS homepage (www.dehs.umn.edu/hazwaste_chemwaste_umn_cwmgbk.htm) and in the Hazardous Chemical Waste Management guidebook.

6. Automotive Fuels

Department of Administration (Admin) – MMD contracts for vehicles manufactured without mercury. The solicitations require the vendor to specify if there is mercury in the vehicle, and all responses received in FY06 have been checked to ensure that no mercury is present in the vehicles. The state purchased 218 model year 2007 passenger cars and 75 model year 2007 bi-fuel passenger vans/SUVs/light trucks that use E85 (85%

ethanol) fuel. This is a total of 293 alternative fuel vehicles. The state exceeds the federal requirement of 75% E85 vehicles. MMD 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.

TMD uses ethanol 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, use this source of fuel. In FY 2007, 8,657 gallons of E85 were used from this bulk tank.

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.

PMD has 11 E85 vehicles as replacement vehicles and purchased 87.55 gallons of E85 fuel.

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 biodiesel fuels. More information on these programs can be found by going to the department's website at www.mda.state.mn.us/.

Fiscal year 2007: The MDA had a total of 116 E85 vehicles out of a total fleet of 127 vehicles during fiscal year 2007. The total E85 fuel consumed by these vehicles during FY07 was 19,388 gallons. This equates to almost 100% more E85 fuel used in FY07 as compared to FY06. The department also had a 17.1% E85 usage rate compared to the amount of regular gasoline purchased (currently the fourth highest rate as indicated by the Fleet Council-Smart Committee.

Fiscal Year 2006: The MDA had a total of 103 E85 vehicles in their fleet out of a total of 126 vehicles during fiscal year 2006. Total E85 fuel consumed by these vehicles during FY 2006 was 10,176 gallons. This equates to over 100% more E85 fuel used in FY 2006 as compared to FY 2005.

Department of Commerce – Currently the department has 54 vehicles, 18 of which are leased through the Department of Administration and 36 of which are owned directly. Four of the department's vehicles are E85 capable. The department does not fall under EPAct.

The department's ability to track fuel use (E85 or gasoline) in our vehicles is similar to the issues that other agencies face, and it is not practical to calculate the data by hand. Data on fuel purchases was available through the Department of Administration for the first time in FY06:

DEPARTMENT OF COMMERCE FUEL PURCHASES (IN GALLONS)

	Diesel	E85	Unleaded
FY06	15,899	1,423	35,339
FY07	17,126	1,760	37,335

Department of Corrections (DOC) –Multiple facilities, Central Office, and Field Services reported the use of E85 vehicles in their automobile fleets. Overall, 114 of 249 (48%) vehicles were reported to be E85 capable. That represents a 10% increase in the number of vehicles that are E85 capable. Below is the most recent data available for type of fuel purchased during FY 07. E85 represented 5.7% of all fuel purchased for DOC vehicles during the past fiscal year, up from 4.3% in FY 06.

Utilizing the 18,312 gallons of cleaner burning E85 in place of regular unleaded fuel resulted in a CO_2 emissions reduction of 30,000 kilograms and a NOx reduction of 8.86 kilograms[1].

DEPARTMENT OF CORRECTIONS FUEL PURCHASES (IN GALLONS)

	Diesel	E85	Unleaded
FY06	34,352	15,148	300,897
FY07	31,278	18,312	301,507

MCF-Rush City - Purchased a hybrid vehicle (Ford Escape) for perimeter patrol. This saves approximately 9 gallons of unleaded gasoline each day, approximately 3,200 gallons each year.

[1] *Comparison of Carbon Dioxide Emissions from Gasoline and E85,* Ronald Timpe & Ted Aulich, University of North Dakota Energy & Environmental Research Center, January 12, 2005, www.cleanairchoice.org/outdoor/pdf/E85C02Report2004.PDF

MCF-St. Cloud – The facility has purchased flex-fuel vehicles.

Department of Employment and Economic Development (DEED) –As referenced in Part 2 of this report, we have recommended through policies and procedures that employees traveling on business purchase the cleanest fuel possible when using DEED-owned vehicles. Additionally, an e-mail was sent to our central office employees providing them with a list of the closest E85 gas stations, as well as a link to an E85 gas station search engine.

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 20 passenger vehicles: 10 are owned by the agency and 16 are leased from the Travel Management Division in St. Paul. Ten of these vehicles are flex-fuel vehicles.

The closest service station that has E85 fuel is in Virginia, Minnesota, which is 10 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) – Number of gallons E85 purchased in 2007 = 10,324 (2006 total gallons E85 = 1,900). Number of E85 vehicles in 2007 = 18 (2005 E85 vehicles = 8). Percentage of E85 = 7.74%. (2006 percentage of E85 = 1.3%). In 2006, MAC installed an E85 tank and dispenser at an existing on-site fuel island for use by MAC vehicles. The majority of MAC vehicles are used on airport only and the ability to refuel on-site eliminates the need to drive to an E85 retail station.

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.*

MMCD FUEL USAGE FOR 2007

Fuel type	Gallons	Percent
Gasohol	33,911	83%
E85	6,034	15%
Biodiesel	240	2%
Total	**40,185**	**100%**

For this reporting period, MMCD used a total of 40,185 gallons of automotive fuel. Of that total, 6,034 gallons (15%) was E85 fuel and 240 gallons (>1%) was biodiesel. The remaining 33,911 gallons was low-sulfur, low-benzene gasohol fuel. MMCD used 512 gallons more E85 fuel this year than it did in 2006. District staff have noted that flex-fuel vehicles get less miles per gallon and thus use more fuel than similar vehicles that don't use E85. The district plans to do side-by-side mileage comparisons with Ford F150 pickups in 2008. The trucks are identical Ford 150 2007 models—half of the vehicles are flex-fuel and half are regular fueled trucks. MMCD hopes to report the findings in the next IPPAT annual report.

Minnesota Army National Guard (MNARNG) – In FY 2007, approximately 3,000 gallons of contaminated JP-8 fuel was filtered to original specifications for appropriate use.

Minnesota Pollution Control Agency (MPCA) – See Part 3. b. for data on E85 and fuel use by MPCA.

Minnesota State Colleges and Universities (MnSCU)

Hennepin Technical College (HTC) refuels its vehicles with the cleanest fuel available.

Bemidji State University (BSU) has 57 maintenance and fleet vehicles. One is a gas-electric hybrid and six are flexible-fuel vehicles. None of the flex-fuel vehicles were operated on E85 fuel during FY 2007 due to continued limited availability of the fuel in our region and decreased range of travel. Use of E85 will be initiated when it is more widely available in our region.

Central Lakes College (CLC) – We are working with the U.S. Energy Services to purchase fuels at a lower cost to the college. 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.

Century College – Campus Security Department replaced one of their department vehicles with a smaller more fuel-efficient Chevrolet Malibu, which will save an estimated 260 gallons gas per year.

Minnesota State University, Moorhead – The automotive fleet is available to faculty, staff, and students. Due to the broad nature of vehicle use and the lack of area stations providing E85, it continues to be difficult for the university to monitor the amount of fuel purchased. The fleet includes 10 sedans, one minivan, and six 12-passenger vans. Two sedans are equipped for E85 use. The use of E85 fuel is encouraged. To help reduce emissions and save energy, the Physical Plant has a GEM E-4 electric car for use on the main campus, while the Athletics Department uses three GEM E-4 cars to travel throughout campus. The cost to operate the GEM E-4 cars is approximately $30 per year, averaging 50 miles per week, whereas a gas automobile would cost approximately $400 for the same use. During summer months, bio-diesel is primarily used in the Physical Plant's lawn tractors, skidsteer, and payloader 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.

St. Cloud State University has 13 model years 2005/2006 5-passenger Ford Taurus cars, four 7-passenger Dodge Caravans, and five12-passenger Ford Club Wagons on the Motor Pool Fleet for a total of 25 vehicles. They produce limited carbon monoxide. The university has on-site E85 refueling and has pumped 24,098 gallons of it for motor pool use this last fiscal year. The Minnesota Department of Commerce/State Energy Office monitors E85 usage.

Alexandria Technical College currently has one E85 vehicle in its fleet. The total gallons of E85 fuel used in this vehicle is not available to our campus at this time. ATC has specified that vehicles leased in the future should be E85 compliant.

North Hennepin Community College – Fuel for grounds equipment is stored in an aboveground 285-gallon diesel tank that has secondary 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 Transportation (Mn/DOT) – Mn/DOT purchase of E85 fuel is generally increasing annually, however in insignificant amounts. Currently, use of E85 fuels is not cost effective for Mn/DOT for the following reasons:

- limited locations where E85 is available (although this is improving).
- 19% loss of vehicle fuel efficiency.
- low percentage of E85 vehicles owned by Mn/DOT.

This year, the price difference between unleaded gasoline and E85 has become more substantial, making E85 a more cost-effective option. Mn/DOT drivers will be advised to use E85 per Governor's Executive Order 04-10 and Minnesota State Statute § 16C.135 when E85 costs are at least $0.35 a gallon less than unleaded gasoline. This cost differential is necessary to overcome the loss of fuel efficiency.

Mn/DOT met the federal standard of purchasing 75% of the light-duty fleet as alternative fuel vehicles. Mn/DOT currently has 234 E85 capable units. Mn/DOT's heavy equipment is being purchased with computer-controlled electronic ignition that maximizes vehicle fuel efficiency. Mn/DOT is also working on a plan that would replace its fleet over time with 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. In FY2007, the University of Minnesota E85 fleet and tanks were used for a state-funded E20 test, so no E85 results are available.

	FY 2003	FY 2004	FY 2005	FY2006
Total vehicles	795	830	835	833
E85 vehicles	42	38	71	81
E85 % of fleet	5.28	4.58	11.8	9.72
Hybrid vehicles	3	4	14	14
Gallons of E85 purchased	19,867	18,636	16,997	13,735

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% reduction in greenhouse gas emissions. E85 also reduces harmful exhaust emissions by more than 50%.

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 (FFV) for hard accelerating, higher speeds, and battery charging. Prius fuel efficiency is 42 mpg overall versus 28 mpg 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 (www.me.umn.edu/labs/pp/index.shtml). The Center for Diesel Research (www.me.umn.edu/centers/cdr/index.html) is a good resource of information on test procedures and simple maintenance that can greatly reduce diesel emissions from buses and trucks. Proper choices and use of fuels help reduce air emissions from automobile and bus exhausts and reduce fuel consumption.

7. Automotive Maintenance

Department of Administration (Admin) – TMD and PMD preventative maintenance programs are designed to minimize excessive and/or premature replacement of parts. They also use remanufactured parts whenever possible. MMD has had a contract for Ergonomic Seats for Autos that has been modified to add the option of refurbished seats. This reuses old seats, reducing items in the waste stream, and also saves the state money

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 – Department-wide, much of the regular maintenance is done on site, and wastes generated are recycled or disposed of properly.

Iron Range Resources and Rehabilitation Agency (IRRR) – Automotive maintenance, except for air conditioning systems, is done in Iron Range Resources' 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 picked up and recycled by a scrap-metals facility.

Metropolitan Airports Commission (MAC) – Several vehicles were upgraded in FY 2007, affording emission reductions associated with increased fuel economy.

- 1994 Ford Bronco replaced by 2007 Dodge Durango
- 1999 Ford F-150 replaced by 2007 Ford F-150
- 1998 Ford F-150 replaced by 2007 Ford F-150
- 1996 Ford Taurus replaced by 2007 Suburban
- 2002 Impala replaced by 2007 Crown Victoria

- 2003 Impala replaced by 2007 Crown Victoria
- 2002 Dodge Dakota replaced by 2007 Dodge Dakota
- 1996 Ford Bronco replaced by 2007 Ford F-150
- 1996 Ford F-250 replaced by 2007 Ford F-350
- 1999 Dodge 1500 replaced by 2007 Ford F-150
- 2001 Ford F-150 (two) replaced by 2007 Ford F-150 (two)
- 1999 Chev 2500 (two) replaced by 2007 Ford F-250 (two)
- 1993 Chev 1500 replaced by 2007 Ford F-350
- 1990 Ford F-450 replaced by 2007 Ford F-550
- 1998 Explorer replaced by 2007 Explorer

Ten of the new vehicles acquired in 2007 are flex-fuel and will refuel on site with E85.

ESTIMATED EMISSION REDUCTIONS (IN POUNDS)

CO	$C0_2$	NOx	PM10	PM2.5	VOC	S02
11,921.4	**-27,011.09**	**1,333.87**	**1.51**	**1.268**	**863.60**	**-.315**

Metropolitan Mosquito Control District – As a pollution prevention activity to reduce air pollution under the requirements of the Executive Order 04-08, MMCD adopted the following guidelines regarding the purchase or lease of new district vehicles: Whenever possible MMCD will purchase or lease the most fuel efficient and least polluting vehicles that meet the operational needs of the district under the requirements of the Executive Order 04-08.

In our efforts to reduce air pollution under the requirements of the Executive Order 04-08, MMCD purchased 12 new flex-fuel vehicles (FFV) capable of using E85 ethanol to replace 12 older fleet vehicles. The new FFV vehicles purchased by MMCD in 2007 were flex-fuel Ford F150 half-ton pickups. The average price of each FFV truck was $16,409. MMCD also purchased five non-FFV Ford F150 half-ton pickups. These vehicles do not use E85 fuels and were assigned to regional facilities that do not have ready access to E85 fuel. The average price of each non-FFV truck was $14,075. The additional cost realized by MMCD for FFV trucks was $2,334 per vehicle, for a total cost increase of $28,008 for the 12 FFV trucks.

Using the emissions reduction spreadsheet provided by IPPAT, the 12 older vehicles were entered as baseline vehicles and the 12 new FFV pickups as current vehicles. The miles driven by each vehicle is an average for each group. A reduction total was calculated comparing the older vehicle emissions to the new FFV emissions totals. By eliminating 12 older vehicles from the fleet and replacing them with new flex-fuel vehicles, the district was able reduce tailpipe emissions in 2007. The table below contains MMCD's results for reducing tailpipe emissions in 2007.

MMCD	CO	CO2	Hg	NOX	PM10	PM2.5	SO2	VOC
Gasoline vehicles	4,785.46	5,219.92	0	308.24	0.56	0.33	0.10	488.95
Total	4,785.46	5,219.92	0	308.24	0.56	0.33	0.10	488.95

By using FFVs to replace older vehicles in the district fleet, MMCD hopes to reduce tailpipe emissions that contribute to urban air pollution and possibly cause adverse health effects. MMCD is committed to reducing pollutants generated by its vehicle fleet and plans to continue in the future with a program of replacing older fleet vehicles with more efficient, cleaner running flex-fuel vehicles whenever possible.

Minnesota Army National Guard (MNARNG) – Ongoing Pollution Prevention Opportunity Assessments (PPOAs) are being conducted at MNARNG repair facilities. PPOAs monitor floor-dry usage, changes in oil dispensers, aqueous washers, and fuel and oil mixing machines.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – 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.

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

Alexandria Technical College – 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. As replacement criteria warrant, the vehicles in our fleet are replaced with more fuel-efficient models.

North Hennepin Community College – Major repairs to our vehicles are performed by automotive dealerships. Minor maintenance, such as oil and filter changes, are performed by qualified staff on campus. The recapture of used oils, filters, and antifreeze is performed by these individuals. Recycling of this used material is performed by a local vendor.

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/disposal. This system eliminates 240 gallons of solvent waste per year.

Vehicle fleet operations use absorbent pads to clean up small routine spills, in place of and/or in combination with floor-dri. The pads are laundered and reused. Absorbent disposal has been cut by several (5 to 10) drums per year.

8. Batteries

Department of Administration (Admin) – The Resource Recovery Office (RRO) informs agencies that the Rechargeable Battery Recycling Corporation 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 Materials Management Division (MMD) contract for automotive batteries has provisions for all state agencies to recycle batteries. TMD recycles automotive batteries.

MMD 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:

(1) 600 parts per million by weight by August 1, 1993;

(2) 250 parts per million by weight by August 1, 1994;

(3) 100 parts per million by weight by August 1, 1995.

PMD returns batteries from vehicles and janitorial equipment to vendors for recycling. PMD participates in all voluntary internal battery collection and disposal programs.

Department of Commerce – A battery recycling bin is located in the employee lunchroom. An employee volunteers to collect the batteries and take them to Hennepin County for recycling.

Department of Corrections (DOC) – All facilities collect used batteries and return them to the vendors for recycling when new batteries are purchased. Overall, a ton of used batteries was recycled in 2007.

Iron Range Resources and Rehabilitation Agency (IRRR) – IRRR collects batteries that can't 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 2006, 28,860 pounds of SLABs—an increase of four times over the previous year—were recycled from MCES facilities, mostly through A-Battery City in Minneapolis.

Minnesota Army National Guard (MNARNG) – The MNARNG recycled about 1,500 lead-acid vehicle batteries.

Minnesota Pollution Control Agency – The MPCA 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 proper disposal. MPCA staff properly disposed of 84 pounds of rechargeable nickel-cadmium, nickel metal hydride, lead acid, vehicle, and button batteries in calendar year 2006 at an authorized battery collection point.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – 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.

St. Cloud Technical College – All batteries are recycled. When a new lead-acid battery is purchased, the old one is taken in for exchange. Other batteries are recycled through a local supplier.

St. Cloud State University 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's Chemical Safety Day Program.

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

North Hennepin Community College – All batteries are recycled. Every effort is made to insure that when a lead-acid battery is being replaced that an old worn out one is brought in for exchange at the time of the new battery purchase. Other batteries are recycled through a local supplier.

Department of Transportation (Mn/DOT) – MNDOT 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, purchased new, colorful collection containers and distributed 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% compared to the previous year, by another 18% in the second year, and by 3% in the third year.

Rechargeable batteries are sent to Rechargeable Battery Recycling Corporation for recycling. This is a free service for public agencies and institutions (www.rbrc.org/community/index.html).

9. Cleaning Supplies

Department of Administration (Admin) – MMD employed the services of the Office of Environmental Assistance in awarding its cleaning supplies contract. Adherence to the product selection criteria established in this award will ensure that the cleaning products chosen have a lower negative impact on public health and the environment. Each solicitation responder was required to have their formulations reviewed by an independent laboratory to verify all ingredients found in their products. 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% by weight phosphorus to help prevent eutrophication (nutrient loading).
- The product's organic ingredients must be readily biodegradable in water.

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

MMD has contracts for Rags, Wiping and Sorbent Materials, and for Wipers, Industrial Disposable whose products are made with recycled content and use reduced packaging in shipping the product to customers. These contracts are available to all state agencies and Cooperative Purchasing Venture cities and local governments.

The RRO uses state contract cleaning supplies that have high environmental attribute scores and that are delivered in bulk form to minimize waste and packaging. PMD uses janitorial products that, after use, are safe to discard in sewers. PMD uses chemicals packaged as concentrates to reduce packaging waste by 85%. PMD uses automatic dispensing systems to ensure correct dilutions from concentrates and to minimize waste.

Department of Agriculture – The MDA has not purchased any products containing VOCs (paints, solvents, cleaners, etc.) 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 (Plant Management). However, prior to moving into the new facility, the MDA finalized a contract with Administration's Plant Management Division to provide cleaning/janitorial services for this agency. 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 Materials 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 HEPPA filter systems to ensure indoor air quality standards met."

The agency believes that the contract language stated above, specifying the type of products/cleaning supplies/equipment to be used, will continue to reduce the total VOC content in products used within the facility.

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. These products have a lower volatility and do not evaporate nearly as readily as traditional solvent-based cleaners. Staff places a high priority on using techniques, methods, and products that are non-hazardous or less hazardous, to implement the concept of source reduction.

During FY 2006, the DOC increased its use of environmentally friendly 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.

MCF-Red Wing – Building care workers began using new, environmentally friendly citrus-based cleaning chemicals.

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.

Minnesota Army National Guard (MNARNG) – Internal audits of MNARNG facility cleaning supply storage include a review of shelf life. Whenever possible, shelf life is extended and products are used up. The MNARNG uses a centralized collection point where soiled rags are exchanged for clean. Only rags soiled with POL products are exchanged for clean rags; all other rags are managed as hazardous waste.

Minnesota Pollution Control Agency – The MPCA Alliance for Recycling and Reduction of Waste (ARROW), a group of employees that serves as a point of contact for any recycling (reuse, reduce, or rethink) or composting questions, encourages environmentally preferable purchasing whenever possible. ARROW supports using greener cleaning products in the MPCA building. The MPCA central office has encouraged its contracted vendor to pilot-test greener cleaners that meet environmental criteria, such as products that are nontoxic, water-based, and have low or no odors. Products that meet criteria are placed on a list for the cleaning company to refer to when ordering cleaning supplies. For staff's general desktop cleaning, MPCA buys the environmentally preferable Restore general purpose and glass cleaning products, and uses Restore dishwashing detergent in the lunchrooms.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – Environmentally preferable cleaning products continue to be used in the student residence areas. The products include a floor cleaner, multi-purpose cleaner, glass cleaner, and

carpet cleaner. All the products are Green Seal certified. Products are being distributed with metered dispensers that help to reduce the amount of products used and prevents waste.

Central Lakes College (CLC) – 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.

Century College – Physical Plant Operations has eliminated almost all of their aerosol products and continues to look for the most environmental products available.

Minnesota State University, Moorhead – All buildings are equipped with general cleaning stations involving equipment 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.

St. Cloud Technical College – Environmentally friendly cleaning supplies are used whenever possible. MSDS sheets are maintained in the maintenance office, accessible to all custodians; application and safety procedures are adhered to when products are dispensed and used.

St. Cloud State University– A SCSU committee has been in place for several years that reviews cleaning products that can be substituted for those which 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). On June 31, 2007, our General Maintenance Workers on campus will receive a training program on green cleaning.

Alexandria Technical College – 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's Chemical Safety Day Program. Our Facilities Maintenance Department has converted most of its 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.

North Hennepin Community College – We try to keep all cleaning supplies environment friendly. MSDS sheets are maintained in each custodial closet, and safety procedures are adhered to when products are dispensed and used.

Minneapolis Community and Technical College continues to procure and use products with the lowest potential to contribute to air pollution. In addition to those in 2005 and 2006, we have procured the following: JD Stride Citrus HC 0 VOCs, JD Glance NA 0.1 VOCs, JD Crew Restroom Cleaner 0 VOCs, JD Plaza Sealer 20.26 VOCs, SP SparCling Bowl Cleaner 18.7 VOCs, SP Extraction II Carpet Cleaner 20.9 VOCs, SP Tough on Grease 0 VOCs, and SP Spraybuff 0 VOCs.

Department of Transportation (Mn/DOT) – Mn/DOT uses concentrated cleaners, which allows for the reuse of dispensing containers. The department also uses cleaning systems that automatically measure correct amounts of product to prevent costly overuse.

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 is to optimize supply management and to enhance worker safety and environmental friendliness through a product selection process.

FM formed the Material Review Board (MRB) committee, comprised of both management and labor representation from each zone, safety, and purchasing for the sole purpose of improving the safety, health, and functionality for FM's custodial work force. A dominant cornerstone of the MRB's platform is to consistently improve upon, by careful evaluation and reduction, the inventory of approved cleaning products used by custodians. Reducing the number of approved custodial cleaning products completes two important objectives:

- It improves the safety and health of the end user by eliminating those products that have been evaluated as potentially harmful.
- 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. The approved custodial list of 101 products represents 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 101 approved products went through a process stringent evaluation and testing. The following is the process when an individual or vendor wants a new product to be considered for inclusion into the approved list.

First, the vendor approaches the supervisory staff and provides a cut sheet of the product, but they do not and are not allowed to drop off any product samples. The supervisor in turn provides the vendor with an evaluation packet called the Safety, Health, and Environmental Attributes Form that is to be completed by the vendor's resident chemist. This form is an important first step, because the product is evaluated and scored based on 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 products 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 is disposed of into the waste stream, what effects would the products' constituent chemicals have on the on the environment based on a compiled list of products called the Minnesota Toxics Indexing System (www.pca.state.mn.us/oea/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 if the product has dispensing features with easy dilution ratios to minimize handling exposure, material handling issues, and the availability of the products labeling to meet the specification of the Minnesota Employee Right to Know Act. Finally, the dyes/fragrances category looks to identify 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 have correspondence 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 onto 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 annually replacing 15% 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

	FY01	FY02	FY03	FY04	FY05	FY06	FY07
Metropass	50	47	40	-	39	52	49
Carpool	-	-	-	-	9	15	6

(-) unavailable

Department of Corrections (DOC) – All facilities have video conferencing systems that are used to reduce the amount of travel required for meetings. Also, utilization of Archibus makes a paperless work request and also preventive maintenance program possible.

MCF-Rush City - Set up a recycling program for all staff.

Department of Employee Relation (DOER) expects to continue the use of WebEx for training and meetings through FY 2008. Historical data suggests that 1,151 state employees drove 274,000 fewer miles during FY 2007.

Department of Employment and Economic Development (DEED) – The department replaced one of its state vehicles with a new Chevy Impala, E85 fueled vehicle. 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 15% of our employees.

Promotion of alternative commuting by our agency included 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.

Metropolitan Council Environmental Services (MCES) has made several recent pollution prevention improvements to its fleet of approximately 315 passenger and light service vehicles. There are now 12 vehicles that can run on E85 fuel in addition to unleaded gasoline. E85 contains 85% ethanol, which is distilled from grain such as corn. 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 444 gallons and a Caravan used 66 gallons of E85 in 2006.

The MCES also operates three gasoline/electric hybrid vehicles (one added in the last year). 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. Hybrids achieve an estimated efficiency of 46 miles per gallon in the city and 51 miles per gallon on the highway.

Minnesota Army National Guard – Video conferencing stations have been placed in all MNARNG facilities. This helps reduce the energy costs associated with travel and improved employee time usage.

Minnesota Pollution Control Agency – The MPCA has a continuing pollution prevention approach to promoting alternative transportation including an annual Commuter Challenge and Bike to Work Day promotion, Bikeways and Peak Fare E-newsletters, participation in the Guaranteed Ride Home Program, Telecommuting, special off-day parking, reserved carpool/vanpool parking, discounted bike lockers, and shower facilities.

Since 1999, the MPCA has offered to its employees Metro Transit's Metropass, an all-you-can-ride bus pass that encourages transit use to help reduce air, water, and soil pollution, congestion, parking demand, and urban sprawl. In FY 2007, 89 employees enrolled in Metropass. The agency subsidizes the Metropass through pretax

payroll deduction, and employees now pay less for this than for contract parking. The MPCA also encourages employees to use the Metropass for business trips within the Twin Cities area, thereby saving the state money in parking and vehicle expenses. The agency also has one electric bike for business use.

Minnesota State Colleges and Universities (MnSCU)

Hennepin Technical College (HTC) – Employees are encouraged to utilize video conferencing as an alternative to driving to intercampus meetings and to ride-share whenever possible.

Central Lakes College encourages our employees to car pool 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.

Century College has added two bus stop shelters to promote bus ridership. Students may purchase discounted bus fares for the semester through the College Connection office.

Riverland Community College currently encourages our employees to car pool as an alternative to single-occupancy vehicle commuting. Last year, we requested departments report monthly the number of miles they carpooled and how many participated. Employees are encouraged to have teleconference meetings between the campuses whenever possible to cut down on travel. Over the past year (2007), we have seen a lot more carpooling efforts. The logs show 2 to 5 employees carpooling over 5,000 miles together. We will continue to encourage this and hope to see a rise in logging the miles. It is difficult to get everyone to submit logs.

Minnesota State University, Moorhead – Approximately 77% of MSUM students are living off campus. This along with faculty and staff equals a large commuter base for the university. University administration continually encourages students to take advantage of on-campus living and promotes new student housing construction projects. Campus Security and Parking Enforcement use bicycles instead of automotive vehicles to patrol campus. The university is increasing the number of bicycles racks around campus, promoting their use. Two programs have been implemented with great success reducing 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. Approximately 65,000 riders utilized this service, and it continues to increase in popularity and riders. 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 approximately 2,300 students enrolled in this program. Also, due to the diversity of programs at MSUM, any students, faculty, or staff attending off-campus meetings and conferences are strongly encouraged to form a car pool in order to reach their destination.

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

St. Cloud State University 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% for January 2004 compared to January 2003.

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

Minneapolis Community and Technical College is continuing the activities from 2005 and 2006. This year, we received an additional 50 bike racks.

Department of Transportation (Mn/DOT) – Mn/DOT maintains traffic lanes set aside for vehicles with multiple passengers and has constructed various park-and-ride sites that promote carpooling, busing, or light rail commuting. 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 – The University of Minnesota is host to the Zipcar, which is 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 is hoping 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 2006, the University of Minnesota was once again designated one of the Best Workplaces for Commuters SM by the U.S. Environmental Protection Agency (EPA) and U.S. Department of Transportation (DOT). Best Workplaces for Commuters SM, 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 SM (www.bwc.gov) is a public-private partnership developed by the U. S. EPA and DOT. 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 are 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 over 10,000 gallons of fuel and significant reduction of environmental pollution.

The University of Minnesota, Twin Cities has 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% of those visits were people driving to campus, while 13% 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% driving and 24% arriving by bus. Another encouraging result shows 64% 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 over 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 UMD ID or U-PASS. The DTA has transported more than one million UMD students since the induction of the U-PASS in September of 2000. The free-ride U-PASS contract between the DTA and UMD is in service through the 2007-2008 academic year. The over 2,000 riders per day is outstanding usage of this program which decreases traffic congestion, fuel consumption, air pollution, and the need for taking 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 has also had a dramatic impact on 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 over 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 (www.its.umn.edu) conducts 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's Transportation Center program of the United States Department of Transportation (USDOT). 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 by being a catalyst for transportation innovation through research, education, and outreach (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: a) create an environment for faculty, students, and practitioners from multiple disciplines collaborate in transportation research and education efforts; b) 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)

Resource Recovery Office (RRO)

- Provides educational-work opportunities to St. Paul Schools' students in their "Transition to Independence" school year and summer school programs.
- 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% of their discards, with 28 agencies recycling more than 80%.
- Conducts tours of the State Recycling Center and of its reusable office supplies area for customers and other interested parties to share recycling and waste reduction successes.

- Prepares Info-to-know wall postings displayed in Capitol Complex buildings to inform tenants about pollution prevention, office clean outs, electronics recycling, waste reduction, and recycling issues.
- Represents the Department of Administration at Minnesota's Interagency Pollution Prevention Advisory Team meetings. Representatives from MMD and PMD regularly attend this meeting.
- Provides Department of Administration support and representation on the Pollution, Reduction, and Recycling Advisory Council of the Office of Environmental Assistance.
- Partners with Sentencing-to-Service Programs to provide offenders with recycling-based work and training.
- 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 (OSC) Product Show and the Accounting and Procurement Spring Fling.

Materials Management Division (MMD)

- During FY07, MMD, as a part of its Authority for Local Purchasing (ALP) Training, ALP Management Overview, and other training programs, conducted 19 training sessions and trained more than 543 state agency staff in pollution prevention and procurement of environmentally responsible goods and services. MMD worked with the Office of Environmental Assistance (OEA) to provide additional environmentally responsible information through the purchasing training provided to state employees.
- conducted informational sessions for 288 vendors to learn how to do business with the state. In each session, vendors were encouraged to offer environmentally responsible goods and services to the state when available and how they can request an addendum if products are excluded because of the requirements listed in the solicitations document.
- MMD's website continues to provide the entire ALP manual and all updates, greatly reducing the need to print hard copy versions.
- 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.
- maintains a list of state contracts that contain environmentally preferable products and services. The list is available on the MMD web site at: www.mmd.admin.state.mn.us/envir.htm.
- has combined the advisory committee, Environmentally Responsible Work Group, into the Procurement Coordinators Group in order to increase attendance and awareness of environmental matters. This group works to promote environmental purchasing in state government and is a multi agency group.
- a new group of Cooperative Purchasing Venture (CPV) members that meets quarterly. One role of this group is to increase awareness and knowledge about environmental products and options in purchasing.
- Continues to educate entities on using recycled paper.
- MMD and RRO 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 created to simplify green purchasing. It includes data on product options, sample specifications, existing Minnesota contracts, etc. The guide has been distributed to all certified purchasers and to cities and counties. MMD and RRO promoted this guide on displays and during presentations. The guide is featured at all ALP training sessions. A copy of the guide is available through a link to the OEA on MMD web site.
- maintains a section on its web site dedicated to environmental purchasing. Featured in this section are:
  - Environmentally preferable goods and services lists
  - Minnesota legislative requirements
  - Administration Biennial Report on MMD Purchasing
  - Product experience/case studies on environmentally preferable products
  - Links to other web sites helpful in environmental purchasing

MMD 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.

Department of Commerce – Employee and news information is distributed via the department's internal website. The department also operates the Energy Information Center. Staff responds to consumer inquiries by telephone, e-mail, and at outreach events around the state. In the last several years, there has been an emphasis on reducing the amount of printing by concentrating on responding to inquiries electronically.

ENERGY INFORMATION CENTER

	FY01	FY02	FY03	FY04	FY05	FY06	FY07
Contacts*	60,000	61,000	63,000	62,127	54,856	66,096	64,618
Printed	240,000	200,000	127,000	-	-	75,277	31,791
Web site+	-	-	94,000	81,204	54,130	160,148	549,130
CDs	31,000	40,000	-	-	-	64,685	14,744

(-) unavailable; * Phone, in-person, e-mail responses; + individual visits.

Department of Corrections – Multiple locations deliver staff training on pollution prevention, hazardous waste management, and recycling. Green committees exist at many facilities with the goal of increasing employee awareness to reduce/reuse, as well as focus on energy and resource conservation. In FY 08, more central coordination of these groups will be undertaken in order to increase the profile and make the efforts more effective.

MCF-Lino Lakes – Employee training on hazardous waste and waste minimization was completed during FY 07.

MCF-St. Cloud - Continues to execute the strategies of their Resource Management Contract. Beginning in January 2006, MCF-SCL has been working with their local trash contractor to identify ways to reduce and reuse. Savings incurred as a result of these activities are shared between the facility and contractor.

Metropolitan Airports Commission (MAC) – MAC employees are trained annually on spill prevention, control and countermeasures, and stormwater 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 2006. MCES prepared a specific pollution prevention website (www.metrocouncil.org/environment/PollutionPrevention) for industries, customers, and other external users.

IWPPS staff attends quarterly meetings as regulatory advisors for the Healthcare Environmental Awareness and Resource Recovery Heart Team (HEARRT) that addresses environmental issues within Minnesota's healthcare industry. Additionally, staff meets monthly with the Solid Waste Management Coordinating Board (SWMCB) and the Minnesota Pollution Control Agency (MPCA) representatives to develop consensus on managing hazardous waste from healthcare facilities.

An effort has been made to inform the public of the environmental impacts of pharmaceutical and personal care product disposal, or PPCPs. The broad and diverse collection of thousands of chemical substances can impact fish and other aquatic life when disposed of down the drain. Even after treatment at a wastewater plant,

PPCPs can be present in effluent in minute amounts. Therefore, it is recommended that they be disposed of in the solid waste destined for an incinerator or a modern landfill in order to prevent pollution of our waterways.

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.

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

Minnesota Pollution Control Agency – The MPCA 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 to help staff minimize waste at work and at home on a daily basis.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU – Bemidji State University continues to require environmental courses for satisfactory completion of the Liberal Arts core. “People and the Environment” is one of 11 categories in the university’s Liberal Education Program. Students pursuing a bachelor’s degree must take a minimum of one, three-credit course in this category.

Minnesota State University, Moorhead – The Department of Environmental Health and Safety continues to educate the university community regarding hazardous waste management, pollution control measures, stormwater 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. Students have taken the initiative to form groups of their own that help raise awareness within the community as well. These groups help educate the university community by becoming involved in yearly events such as Earth Week, campus cleanup day, and many more.

A new sociology class, People and Environment, has been added to the incoming freshman core curriculum. The goal of the class is to develop students’ understanding of the concept of sustainability and the challenges in responding to environmental problems. Students examine how societies and the natural environment are intimately related and develop a better understanding of ecosystems and the ways in which different groups interact with their environments.

In Fall 2003, a group of MSUM students came together to create a Sustainable Campus Initiative. This document contained a list of goals and recommendations for MSUM to help university evolution toward a more sustainable future. This document was taken to the MSUM student senate, and work began on creating a student fee to be used for sustainable campus projects. The fee was implemented in fall 2004. The environmental fee is $3 per semester and is charged to each full-time student during fall and spring semester. This money goes into a fund that generates approximately $45,000 per semester. Of those funds, 100% are directed toward the development of sustainable procedures, programs, facilities, and curriculum. Projects currently under way include a wide variety of tasks that affect facilities, policy, curriculum, services, and education of the MSUM community. The development of a student-owned wind turbine,

which would provide power for student facilities, remains a priority of research and funding. Other projects include managing the Residence Halls' recycling program and working with architects to ensure that the construction of the student wellness center follows LEED (Leadership in Energy and Environmental Design) certification recommendations. A task force was formed to manage the money and to research options for improving the MSUM environment. The Sustainable Campus Initiative Committee evolved from that task force and is now managing the funds. The Sustainable Campus Initiative Committee has MSUM students as a majority and contains university staff members, faculty members, and administrators. Regular meetings are held monthly during the academic year.

The students main outreach this year included competing in Recycle Mania, the National Wildlife Federation Campus Ecology Program's national recycling competition, funding/planting over 50 trees on campus, funding/installing 17 permanent bicycle racks, funding a bicycle for parking enforcement, and sponsoring on the MSUM campus a Tri-College Earth Day Celebration along with Concordia College, Moorhead, and North Dakota State University, Fargo. Another major accomplishment was signing of the Talloires Declaration by MSUM President Dr. Roland E. Barden. This declaration states the university is willing to incorporate sustainability in its teaching and business practices.

St. Cloud Technical College – Training is being provided to staff on proper handling of hazardous materials. A hazardous waste program is in place and the appropriate staff was trained on its contents. We also train our students, with a one credit Haz-Mat class, to be environmentally friendly so we pass on to all transportation students these same procedures, plus many more.

St. Cloud State University– The Environmental and Technological Studies Department of SCSU reflects increased opportunities for pollution prevention emphasis in the region of laboratory procedures. A Master of Science program in Environmental and Technical Studies, begun seven 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.

Alexandria Technical College – 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 energy and consumable product consumption. 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.

North Hennepin Community College – Bright colored signs and containers are prevalent in buildings and on our grounds throughout campus. Plant Services staff is aware of the importance of our recycling effort, with new hires trained on proper procedure before they are allowed to work independently.

Department of Transportation (Mn/DOT) – Mn/DOT continually conducts training that includes pollution prevention 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. It includes 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) 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 between 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 Minnesota 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, it is a goal CALA is shooting toward.

The Minnesota Sustainable Design Guide, developed by the Center for Sustainable Building Research (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:

- educate designers, building owners, operations staff, and occupants about the concepts, goals, and significance of sustainable design.
- develop an orderly decision-making process with measurable outcomes along with a database of decisions and outcomes
- 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.
- organize information in a hierarchy that permits users to easily understand the sustainable design process
- 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 covers the basics of pollution prevention. Approximately 2,500 employees are trained annually. The training is offered through classroom presentations and over the internet. The web-based

training program is available on the Environmental Health and Safety home page with University of Minnesota X500 account login.

The Minnesota Technical Assistance Program, MnTAP, is a grant program at the University of Minnesota, School of Public Health, funded by the Minnesota Office of Environmental Assistance. We help 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 (www.mntap.umn.edu). MnTAP provides technical assistance to Minnesota businesses through the following services: 1) telephone assistance, 2) site visits, 3) intern programs, 4) presentations and workshops, 5) technical publications, 6) library, and 7) materials exchange.

The University of Minnesota's Sustainable Forests Education Cooperative (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., The act, which developed principles for the sustainable management, use, and protection of Minnesota's forest resources, 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: kill 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 (www.extension.umn.edu) is the major educational outreach arm of the University of Minnesota, providing services 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) (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 between 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:

- Generate a new transdisciplinary synthesis of concepts and methods for research on sustainability issues.

- Understand forces influencing sustainability at local, regional, and global scales.
- Develop and evaluate techniques for assessing conditions for sustainability.
- Generate policy options for moving communities toward sustainable conditions.
- Facilitate information exchange between scholars, practitioners, and citizens.

12. Electronics

Department of Administration (Admin) – MMD worked with other state agencies and the Office of Enterprise Technology to develop standards for desktops, laptops, and monitors. Environmental characteristics such as Energy Star compliance, RoHS compliance, and EPEAT compliance are part of the specifications. As EPEAT is still in the developmental stages, it was not a mandatory requirement. However, Energy Star compliance is mandatory for the equipment proposed to meet the new state IT standards. MMD worked with other state agencies and the Office of Enterprise Technology to develop standards for servers, storage area network (SAN) and network attached storage (NAS) devices, taking into consideration the power consumption of this equipment.

MMD electronic equipment contracts provide Energy Star compliant computers, copiers, fax machines, monitors and printers. MMD requires that energy-efficient equipment be identified in all new electronic equipment contracts. MMD, as part of the evaluation process of Western State Contracting Alliance (WSCA)contracts to determine whether Minnesota should participate on those contracts, considers the same factors as for Minnesota-generated contracts on energy efficiency, power consumption, and equipment take-back and recycling programs.

MMD 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.

MMD extended the contracts for leasing computer equipment. This will reduce the amount of surplus and used equipment that requires hazardous waste management. MMD developed a Request for Proposal for computer hardware with the assistance of other members of the Western States Contracting Alliance. The RFP considered several environmental issues. Points were awarded to those who proposed for:

- Take back/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

MMD, in conjunction with other agencies and Cooperative Purchasing Venture members, maintained its statewide computer/electronics recycling disposal contract with Asset Recovery Corporation of St. Paul. (Ref: Hazardous Materials: Electronic and Electronic Component Recycling and Management, contract release number H-90(5), contract number 435450.) 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. This past year, approximately $900,000 was paid to Asset Recovery to recycle computer/electronic waste. As of July 1, 2006, cathode ray tubes cannot be disposed of in the trash.

MMD worked with the Legislature on changes to statute on banning certain types of flame retardants used in computer plastics and cabling, and also potential sanctions against noncompliant manufacturers of video display devices.

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

Department of Corrections

MCF-Faribault - Recycled the following in 2007: 342 pounds of cell phones, 1,880 CPUs, 2,396 pounds of miscellaneous electronics, 965 pounds of monitors, and 5,272 pounds of televisions

MCF- Willow River/Moose Lake – Recycled 3.5 tons of electronics.

MCF- Red Wing – Information technology equipment purchases reduced related energy consumption by utilizing more efficient flat screen monitors and power saving shut-offs. In all, 40 new personal computers were purchased in FY 2007 with flat screens and power saving features.

Department of Employee Relation (DOER) – DOER will continue to purchase/lease Energy Star compliant office equipment in FY2008.

Department of Employment and Economic Development – As referenced in Part 2 of this report, employees involved with the purchasing of office equipment are encouraged through policy language to select energy-efficient, Energy Star rated items.

Iron Range Resources and Rehabilitation Agency (IRRR) – The Information Systems Program recycles outdated computer equipment. In FY07, the agencies Information Systems program recycled outdated computer equipment. Last year, we brought 33 desktop computers and 7 laptops (1,924 pounds) and 38 CRT monitors (2,358 pounds) to Asset Recovery Corporation. The CRT monitors were replaced with the LCD flat screen type which consumes 1/3 of the power of the CRT monitors. Information Systems also recycles used printer toner cartridges and purchases recycled printer toner cartridges when available.

Metropolitan Airports Commission (MAC) purchases computer equipment that is Energy Star-compliant with features such as sleep mode that reduce 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) sends used office electronics—computers, cathode ray tubes, disc drives, printers, etc.—to a vendor for evaluation. The vendor salvages what it can for resale. Unsalvageable units are dismantled, and the components are recycled. In 2005, 480 units were recycled.

Minnesota Pollution Control Agency – 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. From 2003 to 2006, the MPCA reused or recycled a total of 65,000 pounds or 35 tons of electronics. Information about reuse or recycling in FY2007 was not available at the time of publication.

The MPCA also participated 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, sponsored by the U.S. EPA, involved 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 cycles and it addresses many environmental issues associated with the design, use, and end-of-life management of IT products. The tool became available for use in July 2006, and the MPCA worked with the Department of Administration and Office of Enterprise Technology to include EPEAT in the IT purchasing specifications.

Minnesota State Colleges and Universities (MnSCU)

Hennepin Technical College (HTC) is reducing energy use by purchasing energy-efficient office equipment and appliances, including continued replacement of CRT computer monitors with low energy-consuming LCD flat-screen monitors.

Bemidji State University (BSU) – All Apple and Gateway computers and HP printers purchased through the university Computer Support Services are Energy Star compliant.

Century College purchases only Energy Star rated computers and LCD panels. Computer settings are optimized to take advantage of energy-reducing capabilities.

Minnesota State University, Moorhead – The reuse of PCs on the MSUM campus is very much encouraged. There is a strong program toward department trading of PCs and donation to student organizations and non-profit 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 help 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.

St. Cloud Technical College – All electronics (circuit boards, computer monitors, computers, etc.) are properly disposed of through licensed contractors. (University of Minnesota Chemical Safety Day Program). The SCTC IT department has a toner cartridge recycling program. They take all of the used toner cartridges from the college and send them free of charge in prepaid shipping boxes to the company called the Funding Factory. The IT department also turns in our old outdated or non-functioning technology items, such as computers, printers, and monitors to Asset Recovery Corporation.

St. Cloud State University– 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 66,693 pounds and net cost of about $18,358) were recycled for somewhat offsetting commodity and precious metal credits. Styrofoam from computer, electronic, and other shipping cartons was also recycled.

Alexandria Technical College purchases equipment that is Star Energy compliant. Obsolete electronics no longer in use at our facilities is 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.

North Hennepin Community College – All discarded electronics are properly disposed of by a licensed local contractor. Due to cost considerations, we no longer lease our computer equipment; it is purchased directly from the supplier. Used and outdated equipment that no longer meets the needs of our curriculum is offered to other state schools for there use. Electronics equipment that is found to no longer be serviceable is recycled through a licensed local contractor.

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% 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 yellow 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 anti-icing and deicing 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 conducts a traffic management and development program to evaluate 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 600,000 pounds of electronic material annually. The university has worked extensively with the Minnesota Department of Administration and other agencies to develop a statewide computer/electronics recycling contract.

The University Computer Services (UCS) and Como Recycling Facility (CRF) both provide collection of unwanted computer systems. UCS markets the usable computers back to the university community (www1.umn.edu/ucs/usedcomp.htm) for a charge.

The university offers electronics recycling service to educational institutions throughout the state via its Chemical Safety Day Program (www.dehs.umn.edu/hazwaste_csdp.htm). 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 six pounds of lead and various other environmentally hazardous constituents that can be reclaimed and reused. Proper management of the electronics protects the university from future environmental liability, conserves resources, and avoids heavy metal contamination of soil, surface waters, and groundwater.

13. Energy – Lighting

Department of Administration (Admin) – SAO specifies automatic turn-off switches for all overhead lighting in its remodeled offices. PMD recycles incandescent bulbs to prevent solid waste disposal. PMD coordinates building lighting retrofits with the SAO and Xcel Energy to reduce energy consumption, thereby decreasing pollution levels. MMD procures only reduced or no-mercury fluorescent lamps. Mercury content in fluorescent lamps has been either eliminated or reduced to negligible levels as required by 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, MMD has developed a statewide contract to recycle fluorescent lamps and HID (high intensity discharge) lamps and light ballasts that contain PCBs (poly-chlorinated biphenols).

MMD has a contract for solar-powered highway warning signs for the Department of Transportation. TMD minimizes lighting through the use of energy-efficient lights.

Department of Corrections

MCF-Rush City – Reduced the amount of electricity used by 520 kWh and reduced the amount of natural gas used by 1456 therms. These two savings areas resulted in emissions reductions of 17,000 pounds of CO_2, 15 pounds of NOx and 4 pounds of SO_2.

MCF-Faribault – Did not heat 10 buildings on-site that are planned for demolition in 2008/2009.

MCF- Red Wing - Facility experienced a reduction in the amount of electricity used.

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 a special hazardous waste due to their mercury content. In 2006, 5,520 lamps were recycled through Retrofit Recycling in Little Canada, an increase of 49% from the previous year. Various fluorescent lamp change-out programs have been underway to replace older lamps with the new, thinner varieties (F30T8) that contain less mercury and are even more energy efficient. Some facilities have installed motion sensor switches that turn off room lights if no motion is detected within 15 minutes.

Minnesota Pollution Control Agency – 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.

Minnesota State Colleges and Universities (MnSCU)

Hennepin Technical College (HTC) didn't purchase any fleet vehicles the past 12 months, but the vehicles we own were the most fuel-efficient available at the time of purchase that met our operational needs. Hennepin Technical College is reducing energy use by purchasing energy-efficient office equipment and appliances, including continued replacement of CRT computer monitors with low energy-consuming LCD flat-screen monitors.

Bemidji State University (BSU) employs energy-conserving strategies in state-owned or leased buildings, purchases electricity generated from renewable sources by buying wind power energy blocks in September 2006. BSU continued an ongoing program of replacing T-12 fluorescent lights and ballasts and incandescent lights with T-8 high efficiency lamps and electronic ballasts and compact fluorescent lighting. During FY 2007, the replacements resulted in a net reduction of approximately 11, 662 watts of lighting. It is estimated that this will reduce electrical energy consumption by about 60,600 kWh. BSU also received a rebate of $6,500 for the project through Otter Tail Power Company's participation in the Minnesota Conservation Improvement program (CIP).

BSU continued an on-going 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. Sensors will continue to be installed on an ongoing basis as funding and time permits.

Central Lakes College (CLC) – Whenever possible, we purchase energy-efficient appliances to reduce state-energy uses at our college. We are working with the U.S. Energy Services to purchase fuels at a lower cost to the college. We have an agreement with our local utilities to curtail our electricity and natural gas. We have a propane back-up system at Brainerd that we use when asked by the local utilities. Staples campus has a 1,000 gallon fuel oil reserve. We have completed energy savings project at both the Staples and Brainerd campuses. All lighting is now T8, and classrooms and bathrooms have motion sensors installed.

Century College has eliminated two hydronic Kewani 165 hp boilers from the West Campus. The college now uses the East Campus boilers to heat both campuses which results in greater efficiency. Note: a 99% efficient Fulton PulsePak hydronic boiler was installed on the West Campus to assist with building warm-up and temperature control. Century also follows state guidelines for building temperatures.

Riverland Community College – Whenever possible, we purchase energy-efficient appliances to reduce state-energy uses at our college. All lighting fixtures have been retrofitted with energy-efficient ballasts and bulbs. We have an agreement with our local utilities to curtail our electricity use by 163 kW 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. In November 2005 in response to the Governor's Executive Order 05-16, we lowered all thermostats to the recommended guidelines. In spring 2006, all thermostats were raised to the recommended guidelines. We will continue this practice as the seasons change. By monitoring academic classes and campus functions, we are able to set units back to unoccupied temperatures through our computerized energy management system.

Minnesota State University, Moorhead – To help better understand ways the university community can save on energy consumption, the campus recently conducted an energy audit. This audit examined lighting, heating, and includes a first-ever water usage assessment. Recommendations following the energy audit's approval 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.

Abiding with Executive Order 05-16, *Providing for Energy Conservation Measures for State Owned Buildings*, MSUM continues to maintain operational changes to conserve energy and reduce state energy

costs by lowering heating temperatures, raising cooling temperatures, and other measures as defined in the executive order by Governor Pawlenty.

Design and construction of a new Student Wellness Center centers 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.

St. Cloud Technical College – Our college campus uses clean burning natural gas for heating and #2 fuel oil as a backup fuel. 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.

St. Cloud State University– As part of a $3 million energy conservation project with NSP, SCSU has shaved peak demand by about 25%. 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.

Alexandria Technical College – Energy conservation strategies have been a major focus for ATC's Facilities and Maintenance Department. Our continuous energy conservation program includes winterizing all overhead and exterior doors each fall and replacing T-12 fluorescent lighting with a T-8 fixture. The T-8 fixture is 30% more energy efficient than the T-12 model. All spent fluorescent bulbs are recycled by a licensed contractor.

Our Facilities Team continues to replace 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. During the 2007-2008 fiscal year, the roof on the 100 and 200 wings were resurfaced during which the insulation was upgraded to increase the roof's insulating capacity and efficiency.

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. 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.

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

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

University of Minnesota – The university has updated its Standards and Procedures for Construction to address energy conservation (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 day lighting 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 – SAO specifies and incorporates, where possible, the use of energy-efficient triple-glazed windows to manage energy loss and heat gain in facilities. MMD created a contract for window-mounted self-contained room air conditioners to emphasize performance over design, establishing a minimum energy efficiency-rating requirement for each unit size. PMD has designed upgrades and expansion of the on-site chiller plant to further improve efficiencies and meet the needs of the additional facilities.

Department of Commerce

Solar Electric Rebate Program. The department operates the Minnesota Solar Electric Rebate Program which offers about a 20 to 25% buy-down on grid-connected solar electric systems.

MINNESOTA SOLAR ELECTRIC REBATE PROGRAM RESULTS (KILOWATTS).

	FY03	FY04	FY05	FY06	FY07
Annual	13	50	104	80.5	66.6
Cumulative	13	63	167	247.5	314.1

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

ELECTRIC ENERGY SAVINGS AND AVOIDED EMISSIONS DUE TO ELECTRIC CIP

	2001*	2002*	2003*	2004*	2005**	2006**
Electricity (kWh)	323,267,204	361,774,831	403,570,318	268,998,041	395,345,173	370,442,558
CO_2 (tons)	265,079	296,655	330,928	220,579	324,183	303,762
SO_2 (tons)	805	901	1,005	669	984	922
NOx (tons)	635	711	793	529	777	728
Mercury (lbs)	9	10	11	8	11	10

NATURAL GAS SAVINGS AND AVOIDED EMISSIONS DUE TO NATURAL GAS CIP

	2001*	2002*	2003*	2004*	2005*	2006**
Nat gas (Mcf)	1,527,548	1,338,796	1,781,059	1,294,389	1,324,656	1,241,217
CO_2 (tons)	92,111	80,729	107,398	78,051	79,876	74,844
SO_2	0.5	0.4	0.5	0.40	0.40	0.37
NOx (tons)	1.7	1.5	2	1.38	1.42	1.33
Mercury	-	-	-			-

* 2001 through 2004 data is for investor owned utilities. Actual reported energy savings.
**2005 and 2006 data includes reported energy savings by municipal and cooperative utilities in addition to savings by investor owned utilities.

Department of Corrections

MCF-Rush City - 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 using cooling capacities based on actual demands, conserving electrical energy. 3,000 kW of electric generation is utilized when necessary for peak power sharing by the utility company, preventing the utility company from having to build additional power generation plants which reduces pollution.

MCF – Lino Lakes – The facility is under contract with Xcel Energy (Tier 1) to provide peak shaving on an on-call basis using the facility diesel generator to pick up the entire electrical load during utility curtailment.

Department of Employee Relation (DOER) will continue to expand its computer monitor power management policy with a target of 100% of its monitors included by the end of FY 2008.

Iron Range Resources and Rehabilitation Agency (IRRR) – To help further energy conserving practices, a baseline regarding energy consumption has been established for the facilities owned by Iron Range Resources. This information is shown in the table below which contains the usage of electricity, gas, and water for FY07 at Giants Ridge, Eveleth Administration Building, and the Mining and Reclamation headquarters. We have not included Ironworld data in the FY07 report, as this facility is no longer operated by the agency.

FY-07 ENERGY CONSUMPTION			
Facility	**Electricity (kWh)**	**Gas (therms)**	**Water (gallons)**
Giants Ridge - Biwabik	2,102,840	63,826	6,558,700
Administration Building - Eveleth	354,080	N/A	14,100
Mineland Reclamation Building - Chisholm	297,040	N/A	209,238

Metropolitan Council Environmental Services (MCES) – The largest treatment plant consumed the following energy in 2006:

	Electricity (kWh)	**Natural gas (therms)**	**Fuel oil (gallons)**
Metro WWTP	156,312,000 +0 .2% over 2005	774,319 -3% under 2005	15,000 -25% under 2005

Substantial energy savings were achieved in cooperation with Xcel Energy in 2005, and with the startup of a new turbine and the sludge fluidized bed reactors in the Solids Management Building. The energy use for 2006 confirms the effectiveness of these energy conservation improvements.

Metropolitan Airports Commission (MAC) purchases computer equipment that is Energy Star compliant, with features such as sleep mode for computer monitors to reduce energy consumption. 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.

Minnesota Pollution Control Agency (MPCA) – The MPCA's central building energy management system uses timers for regulating the temperature during evenings and weekends. The system includes thermostats located throughout the building for individual staff to monitor for energy savings. Seven VendingMisers were also installed in the St. Paul office building to reduce energy consumption by the beverage and snack machines. The Brainerd office energy management system regulates temperatures at night and on weekends to conserve energy when the building is vacant.

Minnesota State Colleges and Universities (MnSCU)

Central Lakes College (CLC) – We have installed a furnace that will burn corn at our Ag Facility. The

payback for the furnace is expected in 2 to 3 years.

Minnesota State University, Moorhead – 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% of the campus's power needs.

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 Environmental Fee, the Sustainable Campus Initiative Committee (SCIC) continues to strongly pursue the construction of a wind turbine. The electricity produced will be equal to the amount needed to operate the Student Wellness Center complex.

TOTAL EMISSIONS REDUCTIONS DUE TO PURCHASING WIND ENERGY	
Electricity	333,332 kWh per year
CO	97.666 pounds
CO_2	612,940.882 pounds
SO_2	2,460.990 pounds
NOx	1,362.661 pounds
PM10	123.666 pounds
PM2.5	95 pounds
VOC	12.667 pounds
Mercury	0.014 pounds

St. Cloud State University– As with the SCSU lighting improvements identified above in Item 13, Xcel 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 No. 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.

Alexandria Technical College does not produce electrical or solar energy on its campus.

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 monitored to help insure efficient operation of facilities.

Department of Transportation (Mn/DOT) has used oil burners in many of its maintenance shops. The 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 – More than $8.5 million for 24 renewable energy projects has been awarded to 61 faculty members, 65 graduate students and postdoctoral researchers, 18 undergraduates, and 8 research scientists at university campuses and research and outreach centers around the state. The awards came through the Initiative for Renewable Energy and the Environment (IREE) to position the university as a national leader in developing renewable energy technologies.

The University of Minnesota 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.

Generation of hydrogen from ethanol. 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% efficiency because you have to remove the water first. But if you use ethanol to produce hydrogen, the efficiency is 50 to 60% 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, Minnesota, 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 IREE with two primary objectives: 1) provide a model for rural communities and agricultural producers to integrate renewable energy systems into their economies, and 2) 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% 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 ensure 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 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 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 is operating at the university's S.E. Steam Plant. The steam production is gas fired at least 70% 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 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 Minnesota 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://www.manure.umn.edu/research/treatment.html#Anerobic).

15. Groundwater Wells

Department of Corrections (DOC)

MCF-Rush City - One well is being used by the groundskeepers for underground sprinkler system. The system is controlled by an electronic timer and has an override which shuts off sprinklers during rain. When needed, sprinkling is only conducted in the early morning hours to derive the maximum benefit and reduce evaporation.

MCF- Red Wing – The facility has two deep well pumps for domestic water supply which are governed by the Wellhead Protection Rule.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead currently obtains water from only one well site, which is located at the Buffalo River Science Center and provides water to that facility only. The well at the Science Center is 83 feet deep and uses groundwater from the Buffalo Aquifer. This well is regularly monitored by the Minnesota Department of Health. The main MSUM campus is supplied water by Moorhead Public Service. They obtain 85% of their water supply from the Red River and only 15% from seven groundwater wells.

St. Cloud Technical College – The wells on SCTC campus are used for lawn irrigation.

St. Cloud State University has a small number of groundwater monitoring wells used for research.

North Hennepin Community College – There is one deep well on site, used only for lawn irrigation.

16. Heavy Metals

Department of Administration (Admin) – All MMD standard solicitation documents now require vendors to indicate if their products contain mercury. This information will allow MMD to work with customer agencies and determine 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 when purchasing hospital supplies.

Department of Corrections (DOC) – Multiple facilities have properly disposed of mercury and lead over the past year.

Metropolitan Council Environmental Services (MCES) – The MCES' IWPP section is responsible for administering the pretreatment program for over 760 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.

METALS LOADING TO METRO WWTP FROM INDUSTRIAL USERS

Metal	1980 (pounds)	2006 (pounds)	Reduction (pounds)	Percent reduction
Cadmium	4,585	48	4537	99.0%
Chromium	64,755	5563	59,192	91.4%
Copper	66,714	4062	62,652	93.9%
Lead	10,600	669	9931	93.7%
Nickel	43,128	2637	40,491	93.9%
Zinc	90,931	5565	85,366	93.9%
Total	**280,713**	**18,544**	**262,169**	**93.4%**

Despite reductions of mercury discharged to the collection and treatment system since 1980, mercury is still of concern due to reduced NPDES permit limits. 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 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 2007, 99% of the dental clinics have installed a separator. The MDA is also promoting this program statewide with a good success rate.

Minnesota Army National Guard – The Combined Support and Maintenance Shop (CSMS) de-paint facility will be converted to an aqueous paint strip system. This will practically eliminate the CSMS' largest waste stream.

Minnesota Pollution Control Agency – On October 27, 2006 an MPCA staff bumped a light fixture in a cubicle and the fluorescent bulb broke. The MPCA Emergency Response Team hired state contractor, Bay West, to clean up the contamination. Office supplies, printer, labeler, carpet squares and chair were removed and properly disposed of. The $5,000 cost of the contractor was paid out of MPCA funds.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – Within the photo development areas on campus, silver continues to be reclaimed. Also, all mercury-bearing thermometers continue to be replaced by nontoxic alternatives as they are found.

St. Cloud Technical College – Classrooms have switched from mercury instruments to electronic wherever they could. As thermostats, gauges, etc, need replacing, we are replacing them with non-mercury-containing parts as much as possible.

St. Cloud State University– Campus wide, efforts continue 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. Minor amounts of gold, silver, copper, and palladium were recovered from our electronic recycling program. Small amounts of heavy metal compounds were removed from SCSU using the University of Minnesota Chemical Safety Day Program.

Alexandria Technical College – 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 Chemical Safety Day Program.

North Hennepin Community College – Hazardous waste disposal is no longer through the University of Minnesota, but through the Minnesota state contract.

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

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.

DEHS started its second mercury thermometer exchange in 2006 in an effort to remove most of the mercury thermometers from the university's labs. The Chemistry Department exchanged out 2,300 mercury thermometers in fiscal year 2007.

The University of Minnesota is cooperating with MCES in a program 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 out flow of the Dental School Clinic's (350 chairs) central chair-side wastewater collection tank to capture fine particles of mercury amalgam filling material before they enter the sanitary sewer.

The university's updated steam plant can burn a fuel mix which is 70% 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. 100,000 fluorescent lamps (8 pounds of mercury) are recycled annually. The university offers fluorescent lamp recycling service to educational institutions throughout the state via its Chemical Safety Day Program (www.dehs.umn.edu/hazwaste_csdp.htm). 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) – SAO specifies and administers proper flame spread materials for interior finishes to reduce or eliminate the spread of fire and toxic fumes. SAO specifies indoor air quality standards of the Minnesota State Mechanical Code in state-owned facilities and additional requirements in their design guidelines. MMD has a contract for Filters: Heating and Air Conditioning. In this contract, the Pre Pleat 40 air filter is made of 100% recycled materials: 100% non-woven recycled synthetic materials. Expanded wire backing support for the filter is made from 100% recycled scrap steel. The die cut clay board frame is made from 100% recycled paper board. Using all these recycled materials in this very popular style filter helps to reduce the waste stream and its impact on pollution.

The Building Codes and Standards Division continues to administer and enforce indoor air quality standards of the Minnesota State Mechanical Code in:

- State-owned facilities
- Public schools
- Hospitals
- Nursing homes
- Supervised living facilities
- Correctional facilities
- Prefabricated construction

The Building Codes and Standards Division enforce flame spread ratings for materials on interior finishes. PMD coordinated with the Department of Employee Relations' Industrial Hygienists to develop janitorial procedures for indoor air quality procedures and standards for statewide recommendations.

Department of Corrections

MCF-Rush City – High-efficiency filters are utilized in the ventilation system and replaced every 6 months. Outside makeup air is monitored via a computerized building automation system to ensure that fresh air intake meets the indoor air quality standards.

MCF – Red Wing - New digital HVAC systems and appliances were purchased in FY 2007 that utilize less energy and incorporate night/off peak set-backs.

MCF- Lino Lakes – A heat recovery ventilation system is use in the new 416 bed housing unit.

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%. New chillers consume 33% 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 Mosquito Control District (MMCD) – To reduce energy usage in district facilities and to meet the requirements of Executive Order 05-16, MMCD raised thermostat settings to 76°F in all district-owned facilities during the summer cooling season.

Minnesota Army National Guard – The MNARNG has performed several asbestos, mold, and lead remediation projects at facilities around the state. In all cases, the purpose of the remediation was to improve the overall air quality in these facilities.

Minnesota Pollution Control Agency – The MPCA The MPCA St. Paul office selected a low VOC carpet adhesive for the re-carpeting of the fifth floor. Refer to Part 3. f. on "Procurement", p.2.

Minnesota State Colleges and Universities (MnSCU)

Hennepin Technical College (HTC) – Hennepin Technical College employs energy-conserving strategies in its buildings through its continued use of computer-controlled HVAC systems for lab, classroom, and office areas. The original cooling system (30+ years old) at our Eden Prairie campus was replaced with the most energy-efficient available.

Minnesota State University, Moorhead – The Department of Environmental Health and Safety, in collaboration with the Physical Plant, reviews any carpeting plans prior to installation, ensuring low-VOC adhesives are used and the carpet meets the Carpet and Rug Institute's indoor air quality emission guidelines. EH&S also oversees the Indoor Air Sensitivity Program that monitors adhesives, paints, cleaning products, etc. that may contain VOCs when used in campus buildings.

St. Cloud Technical College – 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.

St. Cloud State University 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. The painting department not only uses water-based paints and varnishes but is also upgrading ventilation controls to improve and IAQ. 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.

Alexandria Technical College – As HVAC funds become available, Freon-based cooling units are replaced with roof-mounted, energy-efficient cooling systems which reduce energy consumption. New roof-mounted energy-efficient HVAC systems were installed during the reporting period. A contractor calibrated and tuned up all of our boilers to increase their operating efficiency.

North Hennepin Community College – We plan on continuing our program of monitoring/testing indoor air quality. This past year, we performed testing in our Health and Wellness Center and our Plant Service Duplicating area.

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. Digitally-controlled building automation systems maximize energy savings and comfort.

University of Minnesota – The university hosts an IAQ web page (http://www.dehs.umn.edu/iaq.htm) 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 replaced aging building chiller units on the St. Paul campus with an energy-efficient centralized chiller plant, and 32 individual building chillers used on the St. Paul campus were replaced. 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, the central plant will save the university $9 million over the next 25 years. Furthermore, the newer buildings on campus have stand-alone

systems but were built so they could eventually be connected to a central plant. Over the next several years in three more phases, three more chillers will be installed and more buildings will be connected.

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 reduced annual energy costs/use by 15% with a project payback of approximately three years. Recommissioning of buildings can prevent pollution and save money.

18. Ice Control, Sanding

Department of Administration (Admin) – MMD 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. (Contract Release D-156(5). This contract is also available to Cooperative Purchasing Venture city and local governments.

MMD in conjunction with Mn/DOT has added treated road salt to the state salt contracts. The salt is pretreated to prevent corrosion to roadways, bridges, and cars and trucks, therefore reducing the aging of vehicles and increasing the time before they appear in junkyards, and the time needed before replacement. This contract is also available to city and local governments (Contract Release S-954(5)). PMD is currently testing various programs to reduce chemical usage during the winter season. MMD is continuing to work with the Department of Transportation on the development of an approved products list for alternative chemical deicers. Alternatives are sought that will reduce ground water contamination and be less harmful to plants, shrubs, and trees, thereby reducing the amount of plant debris sent to landfills, etc.

Department of Corrections (DOC) –*MCF-Rush City* - The groundskeepers utilize magnesium chloride ice preventer for use on walks.

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 using runway brooms has halved MAC's use of chemicals for pavement deicing. Evaluation of new snow removal equipment and methods is ongoing.

Aircraft deicing uses glycol-based deicing fluid. A glycol containment system at MSP has been designed to significantly reduce the amount of glycol-impacted stormwater 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 - The MPCA renegotiated the lease on its St. Paul office building to require the use of de-icing products that do not contain high levels of chlorides or urea. This reduces toxic runoff for water quality. For the last several years (approximately 2005-2007), the building management company has used MAG ice melting pellets, which contain magnesium chloride hexahydrate (calcium 2 to 3%,

potassium chloride 0.5 to 1%, and sodium chloride 0.5 to 1%). It's safer to use around vegetation, safer on concrete, and corrodes metal less than many other ice melting products.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – The university's Physical Plant aggressively removes ice and snow and uses primarily 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.

St. Cloud Technical College – Building Maintenance employees use environmentally friendly ice melt on our sidewalks. This cuts down on the use of straight salt.

St. Cloud State University– 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.

Alexandria Technical College – 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.

North Hennepin Community College – All sidewalks are cleared of snow and ice, and ice melt applied as needed throughout the winter. Our practice of snow plowing followed by using power brooms on our sidewalks has greatly reduced the amount of ice melt used on campus. A plowing contractor performs snow removal from our parking lots. We are able to better determine when and where to sand parking lots in order to keep sand use to only what is needed by having available a vehicle mounted sand spreader.

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% 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 to 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 these alternatives to determine what products present the least harm to the environment while maintaining or increasing roadway safety. Robert Edstrom heads the Hazard Evaluation Process that is applied to new product types to determine possible environmental effects that may result from use of the product. This information is used to determine whether the department should use the product or if restrictions on use should be implemented.

Mn/DOT Maintenance has developed a Snow Plow Operator Training Program, which provides consistent, statewide training for operators with established standards for performance. Trainees spent 10 days participating 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 and less air pollution 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) – MMD'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. MMD's laboratory supplies contract provides alternatives to laboratory media containing formaldehyde and heavy metals where scientifically possible. MMD, in conjunction with the MPCA, has four full-service and four limited-service contracts for environmental sampling and analysis. These contracts are available to all state agencies.

MMD, 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 that reduces toxic waste and vapors. PMD and SAO designed high-efficiency, energy-saving hoods for the laboratory floor of the Bureau of Criminal Apprehension building. PMD and SAO have approved the use of total heat recapturing technologies and has designed high-efficiency, energy-saving hood controls for laboratory areas of the Ag/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 continuing to reduce use of this apparatus during the past year, the amount of mercury waste generated remained constant at 15 gallons, with continual savings on the cost of hazardous waste removal. Method development and additional equipment is being investigated to further reduce this waste stream.

The laboratory's Environmental Analysis waters section acquired a solid phase extraction system, which has significantly reduced the amount of methylene chloride used in the lab. The benefit to this system is a reduction in both hazardous waste generated as well as reduced employee exposure to the product.

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, using approved methods and vendors.

Minnesota Pollution Control Agency – MPCA's Air Quality Lab has a temperature and humidity controlled room for handling of PM2.5 filters, and additional refrigerator space for storage of PM2.5 filters to meet U.S. EPA guidelines, and tank tie downs in the tank/hazard storage room to comply with the State Fire Marshall.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University – The 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.

Minnesota State University – Moorhead Extensive safety and procedural training/testing are required of all students participating in Chemistry, Physics, and Bioscience labs. Chemical neutralization is taught and incorporated in many experiments, producing a sewer-friendly product. Chemicals continue to be

centralized and tracked with an electronic inventory system that allows faculty/staff to track and inventory chemicals at MSUM facilities, eliminating duplication of chemicals and producing less waste.

St. Cloud Technical College – As the laboratories and classrooms at SCTC are being renovated, new and updated equipment is being installed to prevent pollution of the air, such as air filtering systems in paint booths, welding areas, and labs to prevent pollutants from being released into the air.

St. Cloud State University– 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 bloodborne pathogen controls, and both written response plans and cleaning/disinfection schedules. The Chemistry Safety Committee (CSC) and Chemical Hygiene Officer (CHO) and new CHO 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.

After-hours work controls and the Chemical Hygiene Plan reviews have received special emphasis in all College of Science and Engineering departments that have labs. Renovations have included the addition of more plumbed eyewashes.

Alexandria Technical College – 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 bloodborne pathogen training, including a review of our written response plan, on an annual basis.

North Hennepin Community College – Our old contract with MacNeil Environmental Services has been allowed to end; we hired a full-time health and safety specialist to oversee this area.

Department of Transportation (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 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 (www.dehs.umn.edu/hazwaste_chemwaste_umn_cwmgbk.htm).

DEHS started its second mercury thermometer exchange in 2006 in an effort to remove most of the mercury thermometers from the university's labs. The Chemistry Department has pledged to exchange out 2300 mercury thermometers in fiscal year 2007.

The University of Minnesota Department of Environmental Health and Safety did a pilot project to identify and recycle via distillation laboratory waste solvents that are amenable to distillation and are marketable to university laboratories. Initial successes have produced marketable hexane, acetone, and acetonitrile. The solvent recycling means both less virgin solvents must be produced and less waste solvents to be disposed of. The projected cost savings to the university, if the distillation and marketing focused solely on acetonitrile, would be $800 disposal costs avoided and $30,000 solvent purchase avoided for the annual system capacity of 1,200 liters of recycled acetonitrile. Total projected annual costs are $10,800 that yields a net annual saving of $20,000. Benefit is totally dependant on the price of virgin material that is being replaced and the quality of product from the distillation process.

20. Landscaping

Department of Administration (Admin) – The Plant Management Division composts yard waste whenever practical.

Department of Corrections (DOC)

MCF-Rush City has preserved runoff ponds for wildlife and created acres of wetlands. The facility also increased the amount of landscaped areas to reduce gas used by mowers and water needed.

MCF-Willow River/Moose Lake installed a new parking lot retention pond to control stormwater runoff.

Minnesota Pollution Control Agency – The MPCA'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).

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University continues to maintain an 860 square foot native perennial planting area established in FY 2006. The area was previously planted with annuals. The university has a goal of expanding native perennial plantings across campus. BSU continues to maintain over 600 feet of Lake Bemidji shoreline with native plants and rocks as part of a lakeshore restoration and stabilization project that was completed in 2003.

Central Lakes College (CLC) employs 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.

Century College campus has wetlands and wooded areas that are left in natural state.

Minnesota State University, Moorhead – We continue to review current procedures for lawn, tree, and flower maintenance for the university campus in order to reveal areas where improvement is needed. Due to the large grassy mall area in the center of campus, it remains difficult to make improvements without drastic changes to its aesthetics and character. During the past year approximately, half an

acre of perennial and annual gardens has replaced lawn grass areas in and around buildings, including areas disturbed while replacing/upgrading underground water supply lines to campus buildings and around the newly remodeled Murray Commons and MacLean Hall.

MSUM'S TOTAL EMISSIONS REDUCTIONS DUE TO LANDSCAPING	
CO	245.893 pounds
CO_2	445.450 pounds
SO_2	0.092 pounds
NOx	1.258 pounds
PM10	0.755 pounds
PM2.5	0.694 pounds
VOC	7.077 pounds

MSUM's Regional Science Center implements 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 continues to implement 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.

St. Cloud Technical College – Building expansion and planting trees has reduced the amount of grass that needs to be cut. However, green areas are left in tact to help prevent stormwater runoff pollution.

St. Cloud State University has joined with the city of St. Cloud on many of its stormwater 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.

Alexandria Technical College – Landscaping of newly developed areas employ xeriscaping designs to reduce the use of gasoline-powered maintenance equipment, fertilizers, and also to reduce fire hazards.

Department of Transportation (Mn/DOT) – Mn/DOT uses wood mulch in and around woody plantings to conserve water and help control weeds, which reduces, if not eliminates, the need for a pesticide. Mn/DOT's specification for wood products promotes the use of locally generated non-treated wood waste. The department developed a new construction specification (3882 Type 5) for coarse-ground slash mulch for soil protection, sediment control, and organic carbon sequestration. To eliminate the burning of grubbed materials generated during construction, new specifications have been developed that use slash mulch for stormwater pollution control for stabilizing construction exit dusts and sediments, filtering sediments, and keeping sediments and pollutants on slopes and out of Minnesota's lakes and rivers.

Mn/DOT uses an integrated vegetation management approach that combines the use of appropriate herbicides, bio-control organisms, precision mowing, and ongoing training through internal workshops and annual conferences. This limits the use of herbicides, fuel, and labor. Mn/DOT uses native plant materials in stormwater ponds, vegetative swales, micro-detention cells for mechanical and biological capture of transportation origin solids, metals, and chemicals. The department continues efforts to retain existing large specimen trees and shrubs for perceived noise reduction, thermal pollution reduction, and particulate matter capture.

Living snow fencing placement continues to reduce the need for deicing materials and maintain steady traffic flows. Sixteen miles of standing corn snow capture fencing and six miles of collaborative snow fencing installation with the U.S. Department of Agriculture, in addition to continued living snow fence programs result in reduced chemical and fuel consumption.

Mn/DOT is developing new training materials for the MS4 program and partnering with district maintenance personnel on developing temporary plans for routine stormwater facility management. Mn/DOT is continuing to develop environmental and construction standards for wetland restoration and stormwater treatment technologies including infiltration recharge basins, bio-swale ditches, belowground storage, and fore bay treatment. The integrated approach to stormwater management reduces the discharge of pollutants to waters of the state.

The Roadsides for Wildlife program reduces the need for mowing by integrating native plant communities and education. Sustainable management of best management practices foster reuse of devices over the life of contracts. Mn/DOT is completing studies on deep ripping of different soil textures for water infiltration and plant establishment reduce the need for ponds by treating the stormwater where it falls.

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 (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, use 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 SULIS has developed a Sustainable Lawn Care Information Series (www.entomology.umn.edu/cues/) 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% 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 (www.cnr.umn.edu/sci), an ad hoc committee with a mission to use the campus and its physical facilities as a tool for environmental learning. One of the pilot projects is the Sarita wetland restoration on Twin Cities campus. The building of rain gardens and other pollution preventing landscape stormwater management projects were championed by the committee and have become part of new construction and building renovation projects that provide opportunities to change the landscaping of the campus (see www.dehs.umn.edu/envircomp_swm.htm).

The University of Minnesota Extension maintains a website entitled Sustainable Urban Landscape Information Series (SULIS) (www.sustland.umn.edu). This outstanding site offers a detailed guide to designing, creating, and maintaining sustainable urban landscapes. Aimed at both the public and the horticulture/ landscape industry, the site is composed of four main sections. The first, 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 (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) – MMD, through its Surplus Services operation, 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 MPCA's product stewardship policy proposal.

TMD's material exchange is accomplished through Surplus Services when property has useful life remaining. SAO includes recycling and reusing materials and handling requirements for hazardous materials in all building construction specifications.

Department of Corrections - Multiple facilities have contracts with local farmers to pick up food waste.

MCF-Oak Park Heights sends all foam mattress and pillows to a recycler for reuse, preventing them from going to the landfill.

MCF- St. Cloud recycled 52 tons of cardboard and five tons of mixed metal.

Metropolitan Airports Commission (MAC) promotes reuse internally through a purchasing department policy. 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.

Minnesota Army National Guard – 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 that serves as a point of contact for any recycling (reuse, reduce, or rethink) or composting questions, organizes a "treasure table." Staff places usable items on tables for others to take and reuse. It remains a very popular feature for staff.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – 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.

St. Cloud State University– 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.

Alexandria Technical College – Obsolete but usable materials are exchanged according to the procedures outline in Minn. Stat. §16C.23, subd. 6.

North Hennepin Community College – Used but serviceable computers and components are given to other schools that express 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 (www.dehs.umn.edu/hazwaste_chemwaste_freechem.htm) that finds users for unwanted but usable chemicals and laboratory glassware within the university community. The program distributes approximately 1,000 kg of chemicals per year that would otherwise be disposed of as hazardous waste.

The University Facilities Management, Waste Management/Recycling operates a Reuse Program for redistribution of unwanted office furniture and equipment, and laboratory furniture and equipment (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) – RRO obtains office supplies and paper from the reusable office supplies area at the State Recycling Center. OSC stocks recycled papers, including eight white papers in various sizes and various post-consumer waste contents. OSC also offers white papers that:

- contain 100% post-consumer content
- is processed chlorine-free
- is acid-free for a long bright life
- has outstanding opacity for two-sided copying
- exceeds all state and federal requirements for recycled content

The stocked colored papers at OSC contain 30% post-consumer waste. OSC and MMD conducted a test of 100% recycled paper. Paper was supplied by the current contract holder to allow several state offices to use

100% recycled paper in their day-to-day operations and compare the quality to the 30% recycled. One of the issues for agencies purchasing 100% recycled content paper was the higher cost. The paper contract was renewed in July with a decrease to the price of 100% to bring it below the price of the 30% recycled paper.

OSC has discontinued printing the 13,000-page catalog in favor of an electronic catalog. In past years, a minimum of 2,500 catalogs were distributed to OSC customers. OSC's electronic catalog reduces paper consumption by allowing customers to order online without the need to fax or mail in an actual order form. A convenient express order form allows faster order placement. The goal for FY05 was to receive at least 51% of the orders online; OSC had an average of 50.91% at the end of FY05. In FY06, the average topped 60% and continues to grow. 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 and MMD renegotiated the Office Supply Contract with the focus on standardizing items and best pricing on the most commonly ordered products. The most commonly ordered products have been combined in the First Choice catalog, which has 3,300 items available. Of the 3,300 of items available, 724 items are recycled. Sales of recycled products total $214,671. OSC's invoices are printed on recycled paper. All OSC newsletters and price lists are available online. OSC's joint programs with S&T Office Products and General Ribbon Corp (GRC) for providing remanufactured laser toner cartridges continues to grow. These cartridges are performance guaranteed and are put through GRC's intensive factory certification process, which ensures quality performance. In FY05, this offering started with one vendor with 16 products and during FY06 OSC and S&T continued to add additional vendors and products. Used and empty cartridges are returned to OSC, palletized, and sent back to S&T Office Products to be returned for remanufacturing. OSC continues to solicit recommendations from the OSC User Group to keep improving this program.

MMD buys only 100% post-consumer recycled papers for all of its printers and copiers. MMD recycles laser printer cartridges. The Risk Management Division continues to request soy-based ink for printing orders. The Risk Management Division recycles printer and typewriter toner cartridges.

FY 2007 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

Paper type	Reams	Energy (BTUs)	CO2 emissions (lbs)	Wood use (lbs)
Virgin paper	320	31,000,000	4,552	6,000
30% post-consumer	16240	271,000,000	41,069	40,000
100% post-consumer	1380	75,000,000	12,358	0

Furniture. MMD has contracts for remanufactured Herman Miller and Steel Case system furniture that allows 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 (Feb. 94) and allows trade-ins of Herman Miller and Steel Case system products.

MMD has contracts with MINNCOR for furniture refinishing, reupholstering, 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. MMD, through the Furniture Users Group, acts as a clearinghouse for systems furniture, notifying members of the availability of used systems furniture, or other agencies' need for used systems furniture. This facilitation leads to increased reuse of on-hand furniture, reducing waste.

MMD has specified in the General and Ergonomic Furniture Seating contract that the products on contract be recyclable, that the vendor accept product stewardship, and that the products can be remanufactured. MMD has contracts for systems furniture that require the vendor to meet the California Indoor Air Quality VOC emissions. The specifications also set minimum standards for post-consumer recycled content. Extra consideration for award was given to vendors based on daylight-optimized and acoustic-optimized configurations, those that do not use CFCs (chlorofluorocarbon) or HCFCs (hydro-chlorofluorocarbons) in their manufacture of plastic parts, those that have an established solid waste auditing program, and if they offer a take back program at the end of their products' useful lives.

MMD has furniture cleaning and reconfiguration contracts that include the following specifications: all fabric surfaces shall be vacuumed using high-efficiency particulate air (HEPA) filtration. HEPA vacuum must have efficiency rating of 99.97% of airborne particles 0.3 microns and larger. Fabric cleaning shall be done using a continuous flow recovery machine with a minimum return of 90% of liquid applied to fabric surface. Responders were required to include Material Safety Data Sheets (MSDS) or a list of ingredients for each cleaner or paint they intend to use in the process.

Department of Agriculture (MDA)

FY 2007 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

Paper type	Reams	Energy (BTUs)	CO2 emissions (pounds)	Wood use (pounds)	Water (gallons)	Solid waste (pounds)
30% post-consumer (1070)	5,000					
30% post-consumer (1071)	60					
Virgin	0					
Total	**5,060 reams**	400 million	60,693	58,000	197,402	23,295

FY 2006 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

Paper type	Reams	Energy (BTUs)	CO2 emissions (pounds)	Wood use (pounds)	Water (gallons)	Solid waste (pounds)
30% post-consumer	4,810 reams					
30% post-consumer	106 reams					
Virgin	30 reams					
Total	**4,946 reams**	412 million	62,359	60,000	203,406	24,004

(Information taken from IPPAT paper use spreadsheet and Environmental Defense Paper Calculator)

Department of Commerce

PAPER CONSUMPTION (REAMS UNLESS NOTED)

Type	0%	30%	100%	Total	GHGe	Wood
FY04	0	6,790	0	6,790	85,731 lbs	82,385 lbs
FY05	0	7,681	0	7,681	96,981 lbs	93,196 lbs
FY06	20	7,770	0	7,790		
FY07*	10	6,910	0	6,920		

*Includes Weights and Measures Division

Department of Corrections (DOC) – The following data represents the impact of paper use reported for all DOC facilities and the corresponding energy use and greenhouse gas emissions associated with that use. The total paper used the previous year is listed in parenthesis.

MCF-FRB – 6,520 (5,020 in FY 06) reams (16 tons) of 30% post-consumer content paper

MCF–OPH – 3,000 (3,000) reams (8 tons) of 30% post consumer content paper

MCF-SCL – 5,044 (5,652) reams (13 tons) of 30% post consumer content paper

MCF-WR/ML – 4,510 (6,200) reams (11 tons) of 30% post consumer content paper

MCF-LL – 8,500 (7,000) reams (21 tons) of 30% post consumer content paper

MCF-STW – 5,374 (11,590) reams (13 tons) off 30% post consumer content paper

MCF-RC – 4,160 reams (10 tons) of 30% post-consumer content paper

MCF-RW – 2,090 reams (5 tons) of 30% post-consumer content paper

MCF-SHK – 3,160 (4517) reams (8 tons) of 30% post-consumer content paper

Field Offices & Central Office –10,891(11,420) reams (27 tons) of 30% post-consumer content paper

Total Corrections 30% post-consumer content paper use – 51,749 (58,559) reams (129 tons).

Using 129 tons of 30% post-consumer content paper instead of virgin paper resulted in the following positive environmental impact*:

Action	Baseline-Target	
Wood use	134 tons	929 trees
Total energy	647 million BTUs	7 homes/year
Purchased energy	-134 million BTUs	-1 home/year
Sulfur dioxide (SO2)	21 pounds	4 18-wheelers/year
Greenhouse gases	81,583 lbs CO2 equiv	7 cars/year
Nitrogen oxides (NOx)	155 pounds	<1 18-wheeler/year
Particulates	197 pounds	18 buses/year
Total reduced sulfur (TRS)	13 pounds	
Wastewater	338,633 gallons	<1 swimming pool
Biochemical oxygen demand (BOD	9 pounds	<1 home/year
Total suspended solids (TSS)	126 pounds	<1 home/year
Chemical oxygen demand (COD)	2,482 pounds	5 homes/year
Solid waste	43,485 pounds	2 garbage trucks

Source: Environmental impact estimates were made using the Environmental Defense Paper Calculator. For more information visit http://www.papercalculator.org

Iron Range Resources and Rehabilitation Agency (IRRR) – The purchasing/accounting staff buy office supplies from Central Stores. The agency purchased 907 reams (618 reams less than FY06) of Domtar 30% recovered fiber paper in FY07 for copiers, printers, and fax machines. Wood and energy used as well as information concerning atmospheric emissions to produce 907 reams (2.27 tons) of paper is found below.

FY 2007 PAPER CONSUMPTION

Wood use	6 tons
Total energy	76 million BTUs
Sulfur dioxide	59 pounds
Greenhouse gases	11,481 pounds CO_2 equiv.
Nitrogen oxides (NOx)	39 pounds
Particulates	25 pounds
Hazardous air pollutants	4 pounds
Volatile organic compounds (VOCs)	10 pounds
Wastewater	37,342 gallons
Biochemical oxygen demand	14 pounds
Chemical oxygen demand	165 pounds
Adsorbable organic halogens (AOX)	1 pound
Solid waste	4,407 pounds

Resource Recovery furnishes our agency with a box at each work station in which we deposit our recyclable office paper. 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% 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 1,220 reams over 2006 levels. The amount of recycled-content paper used, as a percentage of the whole, has been flagged as an area of improvement for the next year.

Paper type	Reams	Energy (BTUs)	Greenhouse gas emissions (CO_2 equivalents in pounds)	Wood use (tons)
Virgin paper	5,610			
30% post-consumer paper	1,230			
100% post-consumer paper	0			
Total paper used in 2007	6,840	26,000,000	3,814	<3

Metropolitan Council Environmental Services (MCES) – In 2006, MCES used 11,609 reams or 29.02 tons of 30% recycled-content office paper. Using the Environmental Defense Fund's web-based paper calculator (www.papercalculator.org), this results in 146,777 pounds of CO_2 equivalents of net greenhouse gases and 70 tons of wood. For paper without recycled content, 2,667 reams or 6.67 tons were used in 2006. Using the calculator, this results in 36,954 pounds of CO_2 equivalents of net greenhouse gases and 23 tons of wood.

Metropolitan Mosquito Control District (MMCD) used approximately 800 reams or 2 tons of office paper in 2007. This is a sizeable increase in the amount of paper used compared to 2006 when the district used 580 reams of office paper. The reason for the increase is because Metropolitan Mosquito Control and the Metropolitan Emergency Services Board (MESB) entered into a shared resources agreement for office equipment, network resources, and some office supplies such as paper. By combining the purchase power of the two agencies, office paper is purchased in bulk at a lower cost per ream and then shared by each agency. Much of the increase in paper usage for 2007 can be attributed to MESB staff.

The average post-consumer content for all the paper used was 25%. Using the paper calculator on the Environmental Defense website, the energy, raw materials, and pollution generated to make 800 reams of paper was calculated. The net greenhouse gas emissions in CO_2 equivalents was 10,326 pounds while the wood used to make the paper was 10,000 pounds. The table below compares district office paper usage for 2006 and 2007.

METROPOLITAN MOSQUITO CONTROL DISTRICT OFFICE PAPER USAGE 2006-2007

Reporting period	Quantity used (reams)	Recycled content (%)	Energy used (000 BTUs)	Greenhouse gases (lbs)	Wood used (lbs)
2006 Fiscal Year	580	30%	48,000	7,334	8,000
2007 Fiscal Year	800	25%	68,000	10,326	10,000

The district is currently reviewing the printing and copier processes used by MMCD and MESB in an effort to reduce the amount of paper and printer ink used. 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.

Minnesota Army National Guard uses 30% post-consumer recycled office paper. Approximately 60,000 pounds of 30% post-consumer recycled office paper was purchased. Utilizing the Environmental Defense website calculator, comparison between virgin paper and 30% recycled, the following savings or decreased

generation were achieved: 31 tons of wood, 150 million BTUs of power, 19,000 pounds of greenhouse gases, 79,000 gallons of water, and 10,000 pounds of solid waste.

Minnesota Pollution Control Agency MPCA uses Savin IKON and Canon copier machines, and purchases remanufactured toner cartridges for these machines as well as for the majority of the black-and-white printers. The agency uses 100% post-consumer copy paper processed without chlorine for all of its basic printing and copying needs. In FY2007, the MPCA purchased a total of 10,211 reams of 100% post-consumer paper and a total of 1,380 reams of various papers with a minimum 30% post-consumer content.

FY07 PAPER USE AND ASSOCIATED ENVIRONMENTAL IMPACTS

Paper type	Reams	Weight (tons)	Energy savings (BTUs)	CO_2 emissions savings (pounds)	Wood use savings (pounds)
Virgin	0	0	0	0	0
30% post-consumer	1,380	3.499	18 million	2,213	4 tons
100% post-consumer	10,211	25.528	426 million	53,815	88 tons

The MPCA saved 444 million BTUs of energy by using recycled-content paper instead of virgin and avoided 56,028 pounds of carbon dioxide emissions to the air. In addition, the MPCA saved 92 tons of wood by using 30% and 100% post-consumer recycled-content paper instead of purchasing virgin paper.

Over 75% of the office supplies purchased are reusable, less toxic, or contain recycled content, including post-it-notes, refillable pens and pencils, file folders, 3-ring binders, and note pads. MPCA 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 on two sides whenever possible to reduce paper consumption by half.

Recycled paper is used exclusively in the office. Letterhead, business cards, and envelopes contain 100% post-consumer recycled-content paper. The MPCA continues to use water-based correction fluid instead of solvent-based fluid. MPCA computers are cleaned with pressurized carbon dioxide instead of chlorofluorocarbons. MPCA audio, video, and digital tapes and computer discs are reused. For all internal meetings, staff specify and purchase lunches and break food and beverages from vendors who offer low- or no-waste packaging and reusable dishware. This reduces waste and cost. The MPCA/DNR cafeteria supplies compostable dishware and flatware. Staff on several floors in the MPCA building use washable linens in the kitchen and restrooms and environmentally preferable cleaning products (Restore brand) in the kitchen and in refillable spray bottles throughout the office.

MPCA's St. Paul office uses reusable visitor badges which waste less paper, provide improved security, are easily distinguishable, and do not damage clothing. MPCA strives to provide information for internal and external customers electronically to reduce paper use, including putting some annual reports on its website. Efforts continue to reuse existing supplies through its central MPCA supply center. The center was set up as a single location to deliver to, and/or select from, all reusable office supplies. It allows for the ordering of environmentally preferable products, provides control over ordering, , easier inventory management, and avoids duplication and overstocking. The system also reduces the number of supply shipments to the MPCA.

The Alliance for Recycling and Reduction of Waste committee at MPCA also encourages staff to make one-sided paper pads with experienced paper. All offices are set up to reuse mailing envelopes and boxes, and to collect one-sided used paper to use for copies that stay in the office. ARROW implemented an environmentally preferable purchasing plan that focuses on purchasing products that are nontoxic; water based, have recycled or post-consumer content, and have no odors. Products that meet the criteria are placed on a reference list for all individuals who order office and cleaning supplies.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – 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. 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 the campus.

FY2007				
Paper type	**Reams**	**Energy use (BTUs)**	**Emissions (pounds CO_2)**	**Wood use (pounds)**
*100% PC	3,600 reams (18,000 pounds)	195 million	32,239	0
30% PC	5,400 reams (27, 000 pounds)	376 million	55, 635	54, 000
Virgin	6,430 reams (32,228 pounds)	618 million	91, 692	112, 000

FY2006				
Paper type	**Reams**	**Energy use (BTUs)**	**Emissions (pounds CO_2)**	**Wood use (pounds)**
*100% PC	3,600 reams (18,000 pounds)	195 million	32,239	0
30% PC	5,400 reams (27, 000 pounds)	376 million	55, 635	54, 000
Virgin	6,424 reams (32,120 pounds)	616 million	91, 385	112, 000

For the last five years, the BSU Print Shop has been using 100% recycled content paper for all of its white paper printing and 30% recycled content paper for all of its colored paper printing. These values were not included in previous years' reports.

Use of recycled content paper and virgin paper in FY 2007 is about the same as compared to FY 2006. This report includes only paper purchased through Central Stores and the Print Shop. Direct purchases by departments using purchasing cards are not included.

Century College primarily uses 30% post-consumer content paper for copying and duplication. Actual volume of paper use by category was not available at this time.

St. Cloud State University – Virgin paper use of 817 reams (4,085 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% recycled content and 30% post-consumer fiber content. Campus consumption of this standard recycled paper declined from 49,900 reams (124.75 tons) to 42,194 reams (105,485 pounds).

Century College purchases only energy-star rated computers and LCD panels. Computer settings are optimized to take advantage of energy-reducing capabilities.

Minnesota State University, Moorhead – Online resources have greatly reduced the amounts 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 continues to take steps toward reduction of 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 to all students online. Last academic year, MSUM used approximately 36,828 reams of office paper, which included 36,043 reams 30% post-consumer content paper, 520 reams 100% post-consumer content paper, and 265 reams virgin content paper.

St. Cloud State University– SCSU extensively uses paper with 50% recycled content and 30% post-consumer fiber content. Whenever feasible, recycled color paper was used; and all white paper used in that copy shop was standard 30% 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. Desks, plants, pesticides, produce, chemicals, computers, and cooking oil for biodiesel were also recycled.

Alexandria Technical College utilizes both new and recycled office supplies, including paper with a 50% recycled content and 30% 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.

North Hennepin Community College – Our paper use for last year was 7,500 reams of virgin bond paper, 100 reams of 20% post-consumer content, and 1,150 reams of 30% post-consumer content. See Paper Calculator attached to this report.

Department of Transportation (Mn/DOT) – Mn/DOT purchased 43,810 reams of recycled paper in FY07. Mn/DOT recycles computers, cardboard, paper, and toner. Mn/DOT copies on both sides of paper whenever possible, purchases printer toner with biodegradable inks, and recycles the cartridges.

University of Minnesota – University Stores sells copy paper to the university departments. The use of recycled content paper decreases energy and wood usage and reduces the greenhouse gas production related to paper production. A decrease in paper sold by University Stores is partially due to "paperless U" initiative to eliminate paper with electronic records where possible. 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) – MMD has established statewide contracts to purchase re-refined motor oil and oil change services that include re-refined oil as a choice. Re-refined motor oil and changing services purchased through state contracts contain a minimum of 25% re-refined base oil, and also contain the required additives to provide optimal engine performance. MMD has a contract for bulk re-refined motor oil. MMD, in conjunction with the Department of Transportation, has a contract to manage used oil sorbents and filters for energy-recovery processing.

Travel Management and PMD's 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. TMD uses a 100% re-refined brand of engine oil when servicing vehicles. Oil filters are drained for 24 hours in order to qualify as solid waste, as opposed to hazardous waste. A vendor licensed under state contract collects the used oil for recycling.

PMD participates in a used-oil recycling program. MMD, in conjunction with the MPCA and CPV members established contracts in most regions of the state for recycling and managing used oil, filters, sorbents, and antifreeze. This is contract release number H-94(5) and the contract numbers are 433735 and 433736.

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 groundwater and soil contamination from the oil being improperly managed. Used oil 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 2006, for all facilities, 4,928 gallons of used oil were transported, a decrease of 19% from the previous year. From the same time, 1,353 pounds of used oil filters were recycled, a decrease of one third.

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.

Department of Military Affairs recycled approximately 4,150 gallons of used oil and generated fifteen 55-gallon containers of crushed used oil filters that were sent to a recycler.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead recycles all oil and oil filters through an approved vendor.

St. Cloud Technical College lets plastic oil containers drip out for at least 24 hours to drastically reduce oil entering the garbage. We do not use floor dry to stop oil absorbing material from entering the sewer; students wipe up spilled oil with towels that have the oil washed out and reclaimed. Squeegees are used to clean up larger spills, and the oil is poured into the waste oil disposal stream. Used oil is collected and recycled; we crush oil filters to remove oil from them and have the filter recycled.

St. Cloud State University– Oil filters are drained for over 24 hours to qualify as special hazardous waste. Motor oil is collected and recycled.

Alexandria Technical College – Oil and oil filters generated on our campus are drained, collected in approved containers, and recycled through licensed recycling contractors.

North Hennepin Community College collects used oil and filters in approved containers and recycles them through a local recycling vendor.

Department of Transportation (Mn/DOT) – Used oil, (see section 14. *Energy Production*), and oil filters are recycled.

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

24. Paints, Coatings, Stripping

Department of Administration (Admin) – MMD specifies no-lead paint for traffic marking and equipment paint. MMD makes solvent-free paint available to state agencies and political subdivisions through its state contract. PMD tested the use of latex-based duct sealant compounds. PMD uses nut chips with shot-peening equipment to remove paint and gasket materials.

Department of Corrections (DOC) – *MCF-Faribault* – Recycled 1,400 pounds of paint and 320 pounds of paint-related materials at the Rice County Recycling Center Reuse Center.

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. Use of high-volume, low-pressure spray technology for solvent-based paints reduces overspray by 40%, 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.

Minnesota Army National Guard – The CSMS switched from a solvent-based, chemical-agent-resistant compound paint to a water-based, chemical-agent-resistant paint. Paint cleanup can now be done with water. A paint gun wash distillation system has processed over 400 gallons of wash water. Sampling has indicated the water can be sent to the sanitary sewer. Contract paint gun solvent purchases have been eliminated.

Paint removal: Purchase of an aqueous paint strip system is in process. This system uses high-pressure water (40,000 psi) to strip paint off all metal surfaces. The system is closed loop, and all water is filtered and deionized and then reused. Paint chips will be the only waste stream.

Minnesota Pollution Control Agency (MPCA) – MPCA'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.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University maintenance procedures continue to reduce the use of organic solvent-based wood sealers. Water-based paints and finishes are used whenever possible.

Central Lakes College (CLC) – Over the last few years, we have encouraged 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.

Century College – Physical Plant Operations as eliminated almost all of its aerosol products and continues to look for the most environmental products available.

Minnesota State University, Moorhead 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 (a virtually odorless, no-VOC line of paint) and Buckeye cleaning products. The Buckeye products currently used are biodegradable and one, Star Spray, is Green Seal approved.

St. Cloud Technical College – 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.

St. Cloud State University has converted almost all possible paint coatings to water-based products to limit VOCs.

Alexandria Technical College – 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.

North Hennepin Community College – Minimal painting is done on site by in-house staff. The small quantities of paint/coatings kept on site are used for touch-up purposes, and are discarded when all of the 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. This eliminated 55-gallon paint drums as waste. Mn/DOT uses lead-free latex or epoxy pavement marking/striping paint. See section 16. *Heavy metals*. All vehicles purchased by Mn/DOT are specified to have heavy metal-free coatings/paints. See 16. *Heavy metals*. Mn/DOT uses stainless steel dump boxes and sanders to prevent future re-furbishing and sandblasting.

University of Minnesota – The university's Standards and Procedures for Construction state that it "recommends and supports" the use of re-blended paint and has developed re-blended paint specifications (www.cppm.umn.edu/standards.html).

25. Parts Cleaning

Department of Administration (Admin) – PMD does not use solvent-based parts cleaning solution. TMD has an aqueous-based parts cleaning machine that generates no hazardous waste. TMD 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) continues to use 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.

Metropolitan Council Environmental Services (MCES) – There are over 24 parts washers at MCES facilities and 277 gallons of solvent were recycled in 2006, an increase of 27% 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. Some plants will use a high flash point, and therefore nonhazardous, solvent on a trial basis. If successful, this will eliminate hazardous waste generation and the plants will not have to be licensed by a county.

Minnesota Army National Guard continues to use parts cleaning machines with ultra filtration baffle system technology that greatly reduces the need for solvent change out. Only small amounts of sludge are removed and disposed of; the life of the solvent is greatly extended.

Minnesota State Colleges and Universities (MnSCU)

Hennepin Technical College (HTC) replaced three VOC parts cleaners in its transportation program at our Eden Prairie Campus with three aqueous cleaners.

Central Lakes College (CLC) – 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.

Century College – Physical Plant Operations as eliminated almost all of its aerosol products and continues to look for the most environmental products available.

Minnesota State University, Moorhead uses a citrus-based, environmentally friendly parts washing fluid in the automotive mechanic shop.

St. Cloud Technical College – Our Automotive Lab has an engine cleaning system that helps separate the oil cleaned from engines and transmission and capture it to prevent pollution. Our Automotive Department also has a contract with Safety-Kleen systems to provide and recycle parts cleaners. Our Medium/Heavy Truck Department is also installing a more environmentally friendly parts cleaning system. In the past year, our Graphics Communications Department switched over to a less hazardous parts cleaning system serviced by Safety-Kleen to reduce hazardous waste.

St. Cloud State University 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.

Alexandria Technical College – The Diesel Mechanic, Marine and Small Engine and Truck Driving programs use a recycling parts washing system that uses a distillation filtration process to virtually

eliminate hazardous waste generation. This system is managed by an outside contractor. This implementation has reduced our generation status from a Small Quantity Generator to a Very Small Quantity Generator, effectively reducing our waste generation fees paid annually to the Minnesota Pollution Control Agency.

Department of Transportation (Mn/DOT) has replaced nonrecyclable 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 Studio Arts department installed a parts washer system for paint brush cleaning that 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 installed a parts washer system using a 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 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 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. 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 – Through an Indoor Air Sensitivity Program, MSUM provides education to users of buildings deemed to have 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) – PMD follows pollution prevention practices during the planting and care of landscaping by its Grounds Services staff. PMD 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. MMD, in conjunction with the Department of Agriculture, has established a contract for the handling of hazardous materials, pesticide packaging, transportation, and disposal. This contract primarily covers the collection of waste pesticides in the state's rural areas. It also provides for the transportation and disposal of pesticides from household hazardous waste facilities throughout the state. MMD has now moved to integrated pest management. The goal of this management approach is to achieve long-term, environmentally sound pest suppression and prevention through the use of a wide variety of technological and management practices. RRO has not required pest control services at the State Recycling Center by ensuring clean facilities that do not attract vermin.

Department of Agriculture (MDA) – The Pesticide and Fertilizer Management Division's 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 pesticide and fertilizer management information can be obtained from the MDA's website at www.mnda.state.mn.us.

Department of Corrections (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.

Minnesota State Colleges and Universities (MnSCU)

Central Lakes College (CLC) – 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.

Century College – Physical Plant Operations as eliminated almost all of its aerosol products and continues to look for most environmental products available.

Minnesota State University, Moorhead – 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 Spill Response Program continues to be updated and implemented for the Physical Plant in conjunction with the university's stormwater 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.

St. Cloud Technical College – 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– We try to use the minimum levels of pesticides and fertilizers necessary to maintain attractive grounds. Phosphate use concerns were addressed in MS4 actions and public community concern/outreach meetings. We use professionally trained contractors to apply lawn pesticides and fertilizers.

Alexandria Technical College 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.

North Hennepin Community College – All pesticide and fertilizer applications for pest control and lawn fertilizing and weed control are applied by licensed private contractors.

Department of Transportation (Mn/DOT) has developed specifications and clarification of fertilizer types, and how it is incorporated and paid. There are four general categories of fertilizers: commercial, phosphate free, slow release, and natural (organic) base types. These categories allow maximum retention into biomass and soil health cycles, customized to the seed mixture and site location.

Several new herbicides have been tested in stormwater conveyance systems. The goal is to best fit program delivery of ditch function using chemical mowing rather than just mechanical mowing and excavation equipment ditch clean-out. While aquatic-labeled herbicides for ditch maintenance can add risk to the protection of waters of the state, reduced costs of digging and hauling and restoration of ditch biomass lowers the cost of maintenance. Robert Edstrom heads the Hazard Evaluation Process that is applied to new product

types to determine possible environmental effects that may result from use of the product. This information is used to determine whether the department should use the product or if restrictions on use should be implemented.

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 (www.ipmworld.umn.edu), sustainable agriculture (www.misa.umn.edu), and precision agriculture (http://precision.agri.umn.edu).

The Elwell Agroecology Farm (http://swroc.coafes.umn.edu/eaf.html) is a 160-acre parcel in Lamberton Township, Minnesota, 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 on-going, 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 (www.cfans.umn.edu), Extension Services (/www.extension.umn.edu), and Biosystems and Agricultural Engineering (www.bbe.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) 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 undertakes 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*.

Metropolitan Airports Commission (MAC) 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 and 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.

Minnesota Army National Guard is committed to the ISO 14001 standard of Environmental Management System. In accordance with ISO 14001 standards, the JFMN (Army) is committed to integrating 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 current MPCA Strategic Plan includes the following objectives, which provide direction for the prevention efforts at the agency and the business systems necessary to track the measurable results from prevention-oriented projects:

MPCA Goal E2e: Provide a reliable information management system that meets the data and information needs of the agency, citizens, and stakeholders.

MPCA Goal E3d: Create frameworks that measure pollution prevention results within the top 10 priority programs by January 1, 2008.

MPCA Goal E2b: Build a system to link the agency's strategic plan, budget, and work plans to evaluate progress toward achieving environmental goals.

MPCA Goal E2c: Implement a system of managing the agency's resources consistent with agency priorities and all applicable laws.

MPCA Goal R2d: By January 1, 2008, work to reduce the generation of Toxic Release Inventory chemicals —and the number of facilities in targeted sectors required to report—by 10 percent from 2002 levels.

MPCA Goal R2e: By January 1, 2011, reduce the number of regulated facilities—or level of regulation required at facilities—by 5 percent from 2005 levels, within selected program areas. (Selection to be made by January 1, 2007.)

MPCA Goal R3b: By January 1, 2011, voluntary pollution prevention actions increase by 10 percent from 2006 levels.

MPCA Goal R3d: By January 1, 2007, work with local governments to leverage their efforts to prevent stormwater pollution and contribute to an annual progress report.

These goals reflect agency priorities regarding pollution prevention, waste reduction, and conservation:

- **MPCA Goal L1a:** By January 1, 2010, 500 tons of lead per year are removed from the disposal system.
- **MPCA Goal L1b:** By January 1, 2007, growth in municipal solid waste does not exceed population growth.
- **MPCA Goal L1c:** By January 1, 2007, a statewide 43 percent recycling rate and 27 percent organics/waste-to-energy rate are achieved. By January 1, 2011, a 50 percent recycling rate and 35 percent organics/waste-to-energy rate are achieved.
- **MPCA Goal L2a:** By June 30, 2006, significant compliance is achieved at 90 percent of solid waste facilities.
- **MPCA Goal L2b:** By January 1, 2008, 75 percent of above- and underground storage tanks will be in significant operational compliance.
- **MPCA Goal L2c:** By January 1, 2006, 90 percent of hazardous waste generators and facilities will be in significant compliance.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – MSUM's Department of Environmental Health and Safety is a strong advocate for protecting the environment. Pollution prevention is part of our effort to deliver a safe work environment. Successful pollution prevention relies on the cooperation and participation of the campus community to ensure a safe and healthy workplace. The EH&S 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 at work and in the community. We promote a proactive policy in environmental matters; one that anticipates and addresses problems before they become regulatory matters.

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.

St. Cloud State University – "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."

SCSU continues to move toward commitment to the full a-h range of Executive Order 04-08 activities. Note, much of our progress is general only (it is currently very expensive to qualify with hard specifics), as we study and promote system changes to efficiently capture this type of information as we move toward reliable benchmarking and control within an environment of academic freedom.

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.

North Hennepin Community College will strive to do its part in protecting our environment through conscientious use of supplies, materials, and equipment, and recycling and reusing 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 has a 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 supersedes Board of Regents Policy: Pollution Prevention and Waste Abatement. A Sustainability and Energy Conservation Policy Work Group (SEC Work Group), appointed by the president, is charged with developing a policy framework that will 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) – MMD continues to require post-consumer recycled paper content on all paper used for printed material to be at least 30%. In addition, MMD 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 and contracts. RROM promotes the use of environmental standards modeled after those used by print shops that are designated as Great Printers.

Department of Commerce – **Electronic License Processing:** The department continues to move toward an online licensing process for the thousands of licenses it issues each year. This greatly reduces paper and mailing costs. Starting in July 2006, nearly all of the insurance licensing (approximately 8,500 licenses) has been handled through online applications. In addition nearly all of the real estate, collections, abstractors, appraisers and mortgage licenses will be online by the end of the summer. This new system provides a feature for licensees to print their own licenses on line, thus reducing postage, printing and mailing in addition to the benefit of licensees not having to travel to the department's headquarters to conduct their license transactions. Our future plans call for extending this feature to other types of licenses we issue.

Department of Corrections (DOC) – *MCF-Red Wing*– No photo fixer was used in FY 2007.

Department of Employment and Economic Development – A push to encourage unemployment benefit recipients to request and receive their benefit payments electronically during the 2007 fiscal year was very successful. As of August 6, 2007, 6% of unemployment insurance payments were by check, as compared to June 2006, before communications to customers, when 84% of unemployment insurance payments were by check.

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 MPCA uses a number of strategies to reduce waste and pollution from printing.

- More online, less in print: Increasingly, the agency uses smaller, less-detailed printed pieces and limits the number of copies printed, directing audiences to websites for PDFs for download. For example, the Prevention and Assistance Division produces a printed postcard about green building resources that points readers to the division's green building web pages for detailed and up-to-date information.
- For publications that are printed, nearly all are put on 100% post-consumer content paper.
- Direct-to-plate: Although limited by the state's purchasing rules, the agency tries to send offset print jobs to printers that use direct-to-plate technology (sometimes called computer-to-plate). This process allows printers 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.
- The division specs vegetable-based ink on print jobs (though most printers now use it by default).
- Many of its short-run print jobs (less than 1,500 double-sided 8.5 x 11 or equivalent) and done in-house on a high-speed color laser printer. This saves money, and it reduces film, developing chemicals, ink and cleaners/solvents waste associated with sending jobs to a film-based offset printer. 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 revisions to be made between runs.

- Recycled consumables: Most of the consumables (toner cartridges, imaging units, etc.) that the MPCA'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.
- The MPCA does a lot of informational displays and signage for events. The designers avoid the use of vinyl banner and signboard substrate (the most commonly used substrate in the industry), and instead use recyclable materials, such as paper or Tyvek, and post-consumer products such as Ecofab fabric. Staff also use display materials and structures that can be repurposed for future uses.

Since 1995, the MPCA has reduced its paper consumption by nearly 50 percent. 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 paper jams.

Individual business cards are printed using a high-speed color copier in the service center. Requests to print business cards are sent electronically to one location to ensure consistent color quality and uniform appearance. In the past, the MPCA bought a box of 500 cards from the state contract vendor each time a staff person changed his/her position or job title. This in-house option reduces the use of paper and saves the MPCA a significant amount of money.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – 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. 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.

Minnesota State University, Moorhead – Campus Printing Services continues using vegetable-based inks and high percentage recycled-content paper. 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 its aluminum plates, litho film, and reclaimed silver. The student newspaper, which is printed off-campus, uses soy inks and is printed on 20% post consumer paper.

St. Cloud State University 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.

Alexandria Technical College – 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 and recycled through our local recycling center.

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

Department of Transportation (Mn/DOT) – The Mn/DOT sign shop uses lead-free ink. The sign shop also uses recycled signs.

University of Minnesota – 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 1 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 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. 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) – 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 MPCA. MMD's 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.

MMD has been proactive in 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. MMD has numerous contracts to encourage sustainability in state government daily activities. These contracts include:

- Hazardous waste management
- Pesticide collection
- Hazardous spill emergency response
- Fluorescent and HID lamp recycling
- Waste paper sales
- Hazardous materials, used oil, filter, sorbent, and antifreeze management
- Hazardous materials, electronic and electronic component recycling and management

MMD continues to require state purchasers to code each purchase order line with the environmental code. This is a required field and can be used to generate reports that capture the types of environmental purchases made by the state. This will allow MMD to more effectively track environmental purchases made by the state. MMD, in cooperation with Environmentally Responsible Work Groups, developed environmental definitions to code all items on purchase orders and contracts. MMD contract solicitation documents require responding vendors to code the goods and services they offer with the state's environmental codes. The codes are required when purchasers complete an order in MAPS. MMD contract release documents now show the environmental code for each item.

All MMD standard solicitation documents now require vendors to indicate if their products contain mercury. This information will allow MMD to work with customer agencies and ascertain whether future specifications

should require mercury-free products or award preferences based on the level of 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, MMD 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. MMD has developed environmentally preferable goods and services contracts estimated in excess of $286 million per year. The list of contracts can be viewed at www.mmd.admin.state.mn.us/pdf/environ.pdf.

MMD continually works with state agencies and outside environmental groups to discover mutually satisfactory solutions to increase environmentally responsible purchasing. MMD's 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. Several years ago, MMD developed a contract for the hazardous waste recycling of excess computers and electronic equipment. It is also analyzing options that would place a greater responsibility for take-back and recycling on the manufacturers.

MMD recently developed a more flexible approach to an existing legislative mandate: State statutes allow a price preference of up to 10% for goods containing recycled content. In most solicitations, MMD awards a 1% preference for each 10% of recycled content documented by the manufacturer; e.g. a product containing 40% recycled content receives a 4% bid preference over a product with no recycled content.

MMD in the past year has entered into contracts for heavy equipment and construction equipment that have increased environmentally friendly characteristics such as recycled content in the equipment, emission friendly engines, or more energy-efficient engines (Contract Releases T-631, T-632, and W-196). MMD has a contract for Erosion Control Materials where several of the products are 100% plant-based material available to state agencies and city and local governments. RRO provides technical assistance regarding environmental purchasing.

Department of Agriculture (MDA) – The capital Complex Facility (Freeman Office Building and Lab) employs an open office neighborhood center concept for office equipment use. Instead of having office equipment stationed at multiple locations (private offices) throughout the building, most equipment is centrally located in the neighborhood centers. There is a center in each main work area of the building (12 total). The center design concept is effective in multiple corporate settings when it comes to reducing costs and energy consumption. Also, more energy-efficient office equipment (Energy Star when available) was purchased during fiscal year 2006.

Twenty-liter "nowpack" containers for methylene chloride are used within the laboratory, which has helped reduce glass waste and the release of hazardous fumes into the laboratory. When available CFC-free laboratory freezers/refrigerators are purchased by the Laboratory Services Division. Whenever possible, vendors are urged to remove or eliminate excessive shipping materials when deliveries are made. This will help reduce the amount of waste material being disposed in local landfills.

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.

MCF-Faribault removed six vehicles from service and purchased five E85 compliant vehicles.

MCF-Oak Park Heights – The Facility's procurement process is a 90% paperless system, using an electronic signature program.

Department of Employee Relation (DOER) supports and follows all environmentally friendly procurement policies by purchasing/leasing Energy Star-compliant office equipment and office paper that has at least 30% post-consumer content. 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.

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.*)

Minnesota Army National Guard – The MNARNG recycled approximately 124,800 pounds of used textiles, such as old uniforms. It also diverted 7,000 mattresses from landfills. The mattresses were recycled through Goodwill Industries in Duluth.

Minnesota Pollution Control Agency – Through its Environmentally Preferable Purchasing (EPP) program, the MPCA follows the Environmentally Preferable Purchasing Guide online at www.greenguardian.com/government/EPPG (EPPG). The EPPG provides public entities with information on environmentally preferable purchasing including laws, guidelines, tools, and resources. See Part 4, item 9, p. 3, *Cleaning Supplies*, for information on the agency's procurement of green cleaning supplies.

The MPCA also purchases remanufactured toner cartridges, while recycling 1,040 pounds of laser printer toner cartridges in calendar year 2006. (See table on page 9.) See also Part 4, item 22, p.5, *Office Supplies* for amount of 100% and 30% post-consumer recycled-content paper purchased in FY 2007.

Since the creation of its market development program, the Prevention and Assistance Division has promoted buying recycled products as a means of supporting the recycling infrastructure. The MPCA strives to purchase recycled-content products wherever possible.

In 2003, the MPCA signed a 10-year lease that incorporates the new State of Minnesota Sustainable Building Guidelines and many specific sustainable remodeling, maintenance, and operations practices. It requires a commercial energy audit of the building and the implementation of cost-effective recommendations derived from the audit.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (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.

Minnesota State University, Moorhead –As a state agency, MSUM has a procurement department in conjunction with the state of Minnesota Materials Management Division. We also use Central Stores, which is an expansion of state surplus services. The Physical Plant has centralized all of its chemicals and supplies, which 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 need-only basis to reduce stock and storage time.

St. Cloud State University uses toilet paper and towels of 100% total recycled fiber content and up to 20% post consumer fiber content. Some carpet fibers are recycled.

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.

North Hennepin Community College – Several items of concern are considered when making purchasing decisions here on campus—the life expectance of the product, shelf life for chemicals, number of uses it can be put to, toxicity of chemical used in expendable product, versatility of the product, and any special disposal requirement that may be required.

Hennepin Technical College replaced three VOC parts cleaners in its transportation program at our Eden Prairie Campus with three aqueous cleaners.

Department of Transportation (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 to encourage use of products with recycled content.

University of Minnesota Facilities Management has developed construction standards, which include sustainable design requirements and other concepts from the Minnesota Sustainable Design Guide (www.msdg.umn.edu). The university's current Standards and Procedures for Construction address energy conservation elements: **1) Design objectives** 1.1) 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. 1.2) The A/E shall utilize the Xcel Energy Assets Custom Energy Assistance Program to assist in its efforts to design an energy-efficient project. These services consist of modeling the projected energy use of proposed designs, suggesting strategies to reduce the projected energy use, and projecting the construction costs and energy savings associated with the suggested strategies. Review the suggested, project specific energy-conservation strategies with the Facilities Management Energy Conservation Group. 1.3) 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. 1.4) The responsibility for choosing and incorporating energy-efficient strategies into the design remains that of the design team and the university. 1.5) Include the means to measure the results of the energy-efficient design strategies in all projects. **2) 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. **3) Mechanical systems** 3.1) Plumbing, heating, cooling and ventilating systems, and control strategies shall be selected and designed to insure minimum consumption of energy consistent with necessary environmental conditions. Consider heat recovery and recycling where economically feasible. **4) 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 day lighting for new buildings. **5) Evidence of compliance:** The A/E shall submit calculations and other data with the Design Development Documents to demonstrate compliance with the conservation policy and the estimated cost impact on construction and operation.

The Center for Sustainable Building Research (CSBR) 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 & 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 and building materials." To integrate environmentally responsible design easily and effectively into the building process, it is 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 (www.sustainabledesignguide.umn.edu).

31. Remanufactured Parts

Department of Administration (Admin) – MMD specifies remanufactured automotive products. MMD has contracts for remanufactured automotive products for state agencies, including diesel engines, transmissions, alternators, and starters. TMD Division uses remanufactured parts for vehicle repair whenever they are available.

Department of Corrections – *MCF-Rush City* - Copier toner cartridges are returned to the vendor 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.

Minnesota Pollution Control Agency – Re-manufactured toner cartridges are purchased for all St. Paul non-support staff black-and-white printers. Genuine HP cartridges are purchased for all regional office and St. Paul support staff black-and-white printers, and all agency color printers. Genuine OEM cartridges for leased copiers (multi-functional devices) are furnished by the vendor as part of the lease agreement. (Note: The MPCA does not buy re-manufactured parts for printers, copiers, or faxes, only genuine parts and kits. Fax machines toner cartridges are purchased directly from the vendor leasing the fax machine.) Spent toner cartridges are collected and recycled by a local St. Paul vendor. The MPCA's Brainerd office also uses remanufactured toner cartridges for its printers.

Minnesota State Colleges and Universities (MnSCU)

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 whenever possible.

Minnesota State University, Moorhead currently uses remanufactured printer cartridges and Xerox copier dry ink and toner cartridges.

St. Cloud State University, St. Cloud uses remanufactured photocopier cartridges.

Alexandria Technical College encourages the purchase and use of refurbished office furniture. 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 remanufactured parts cost effectively prolongs the life of these units.

North Hennepin Community College – All departments of this college are encouraged to return fax machine ink cartridges to the manufacturer for reuse. Ink cartridges from our larger machines are sent in for re-inking/reuse in our Duplicating section. The purchase of paper products containing some amount of recycled material is strongly encouraged.

Department of Transportation (Mn/DOT) purchases several remanufactured parts for vehicle parts replacements.

32. Tanks

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

PETROFUND APPLICATIONS AND FUNDING							
	FY01	**FY02**	**FY03**	**FY04**	**FY05**	**FY06**	**FY07**
Applications approved	1,630	1,204	1,699	1,575	1,541	1,267	1,043
Funding approved (millions)	$13.1	$10.6	$16.6	$14.6	$13.1	$12.3	$8.7

Department of Corrections – All tanks are currently reported under MPCA requirements and have spill containment as required.

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. Fuel islands have been installed for all MSP and MAC vehicles and heavy equipment.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – 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. The Physical Plant also maintains a 1,000 gallon gasoline tank, and a 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. MSUM currently has updated procedures in place and training provided to respond towards spills, overfill, puncture, and other such emergencies.

St. Cloud State University– New storage tanks with underground monitors were installed for our campus boilers.

North Hennepin Community College – 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 285 gallon aboveground tank is used for diesel fuel for our 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 that 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 to reduce the risk of a release.

Mn/DOT fueling systems are comprised of double-walled underground or aboveground petroleum tanks and pipes. They are equipped with leak detection, spill prevention, and overfill prevention equipment to reduce the probability of a release to the environment.

Mn/DOT developed a compliance program that includes information that should increase the likelihood that that tank system equipment is properly maintained. Equipment inspection and maintenance are necessary to ensure that pollution prevention equipment installed with these storage tank systems continue to function properly.

University of Minnesota has reviewed and updated its Spill Prevention Control and Countermeasures (SPCC) plan (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 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. The first is to prevent oil spills. Operating procedures, such as inspections, recordkeeping, security, personnel training, and tank specifications, address this goal (40 CFR Section 112.7(e)). The second goal is to prevent spills from reaching navigable waters or adjoining shoreline. All SPCC facilities must install appropriate containment and/or diversionary structures to prevent spills from reaching waters, unless installation is impracticable (40 CFR Section 112.7(c)). In addition to the minimum requirement for appropriate containment and/or diversionary structures, other secondary containment requirements are specified in 40 CFR Section 112.7(e). For example, bulk storage tanks must have sufficient secondary containment to hold the contents of the largest single tank, allowing for precipitation. The third goal is to 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) – RRO provides waste reduction and recycling technical support to government agencies, which includes referrals to Minnesota Technical Assistance Program.

Department of Corrections - ReTAP conducted an assessment at MCF-Stillwater and provided many recommendations for the reduction of water and energy consumption. In addition, the department will contact MnTAP to determine feasibility of participating in their summer internship program during 2008.

MCF – Red Wing - Lead Electrician and Physical Plant Administrative Assistant attended Xcel Energy Annual Energy Conservation conference.

Metropolitan Airports Commission (MAC) – The Environment Department provides technical support to all MAC offices/divisions, as well as airport tenants and surrounding communities. The MAC provides this assistance 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.

Specific examples of these efforts: 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 in the amalgam recovery program (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 Air, Water, Waste Environmental Conference and the MPCA Collection Systems Operators' Seminar. 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 within MCES, which includes 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. The MPCA needs to respond to this plan for further action to occur.

Minnesota Army National Guard – 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 a department web page for sharing information throughout the organization.

Minnesota Pollution Control Agency (MPCA) – The MPCA is intentionally not reporting anything under this heading because this topic has already been reported in the agency's *2008 P2 Evaluation Report.*

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead recently completed a professional energy audit conducted by the Energy Services Group. 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. The Sustainable Campus Initiative Committee completed a campus-wide environmental assessment through the National Wildlife Federation's Campus Ecology Program.

St. Cloud Technical College – 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– One of the most highly accredited colleges in the nation, SCSU 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.

Alexandria Technical College – Technical support is provided through OSHA, RECRA, MPCA, and private consultants.

North Hennepin Community College – Often our first contact for technical support is our contracted specialist, McNeil Environmental Services, employed by this college in a consultant capacity on environmental and other safety issues.

Department of Transportation (Mn/DOT) – Mn/DOT conducts periodic meeting with district/division personnel who serve as waste management coordinators in addition to their other duties. This group actively integrates waste minimization/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. Procedures in the manual increase the likelihood that wastes are managed according to federal and state regulations, and in a manner that is practical, cost effective, and minimizes risk to the environment. These manuals were distributed to all Mn/DOT facilities.

Mn/DOT has developed a bridge paint removal manual designed as a guide to comply with Minnesota air quality rules, waste management regulations, and to minimize risk to the environment. The manual is available on the Mn/DOT website at www.dot.state.us/environment.html by accessing *Publication and selecting 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. The manual is on the Mn/DOT website at www.dot.state.us/environment.html, go into *Publication* and select *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 has formalized this hazard evaluation process by issuing a technical memorandum.

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 and 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—n 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. The sustainability principles are embodied in the Sustainability Policy adopted by the Board of Regents in June 2004. Several university units are involved in the Sustainable U effort, a common identity for partners organizations such as the Minnesota Institute for Sustainable Agriculture and the Institute for Social, Economic and Environmental Sustainability (ISEES).

Five core goals shape the work of the Regional Partnerships, and form the basis on which we evaluate our effectiveness. These goals are:

- Establish partnerships between the University of Minnesota and Minnesotans in a community- and citizen-driven process for identifying and addressing local, regional, and statewide agricultural, natural resources, tourism, environmental, societal, and economic issues.
- Employ a systems perspective on interactive environmental, societal, and economic issues whenever possible.
- Direct research, education, and outreach resources of the University of Minnesota to meet agreed-upon local, regional, and statewide needs.
- Increase community input and access to, involvement in, and the utilization of, the research, education, and outreach capacity of the University of Minnesota.
- Preserve and strengthen agricultural and natural resources systems for the benefit and worth of the citizenry while enhancing environmental quality and nurturing rural communities.

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.

The University of Minnesota Center for Sustainable Building Research (CSBR, 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 MPCA. 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 state of 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 (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 forestlands 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) – MMD has contracts for tire recovery and for retread tires utilizing old tire casings. TMD, PMD, Department of Transportation, and other state agencies may purchase from these contracts. The state and Cooperative Purchasing Venture members purchased in excess of $600,000 in retread tires in FY07. MMD'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. TMD'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 on the airport's paved surfaces are reused in off-road (agricultural) applications. All vehicle and heavy equipment tires are transported to and recycled by a permitted vendor when no longer useable.

Minnesota Army National Guard recycled 33,000 pounds of tires through the Defense Reutilization Marketing Office in Duluth.

Minnesota State Colleges and Universities (MnSCU)

Minnesota State University, Moorhead – All used tires are replaced and recycled at an off campus vendor.

St. Cloud Technical College disposes of old tires without charge to prevent pollution. All tires are recycled through local vendors.

St. Cloud State University– About 357 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.

Alexandria Technical College – All tires are recycled through a local vendor at a cost to ATC.

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

Department of Transportation (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) – PMD rebuilds parking lots and structures to meet water division guidelines. MMD developed a contract for salmon and trout feed that reduces the effluent produced by excess feeding of fish, which will improve water quality downstream from state hatcheries.

Department of Corrections

MCF-Rush City – The facility is equipped with a computerized water control system for all showers, sinks, and toilets. Ultra-low flush toilets are used with flood-control devices that prevent flooding of toilets. A salt reclaimer has been installed to increase efficiency of the water softening system and is saving the facility 30% on salt used (79,000 pounds per year).

MCF- Willow River/Moose Lake installed Energy Star clothes washers at the new CIP building.

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 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 Humphrey Terminal and the MAC general office were built to these standards.

Metropolitan Council Environmental Services (MCES) is the division of the Metropolitan Council that treats wastewater. The system collects and treats over 358 million gallons of wastewater per day from 104 communities and over 2.4 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 expense budget of the MCES is $194 million with a capital budget of $132 million. Clean effluent is discharged to four area rivers—the Mississippi, Minnesota, St. Croix, or Vermillion. From the Metro Plant alone, over 67 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 either multiple-hearth furnaces or fluidized bed reactors, resulting in an 80% reduction in volume of residual solids. The ash utilization program has been suspended while at the same time analyses and feasibility studies are being conducted for possible approval by the MPCA's case-specific beneficial use determination program. All ashes are presently being landfilled.

Biosolids from the Empire WWTP—without any blended components—are typically landspread on farm fields. In 2006, 1,014 dry tons and 6,551 wet tons were landspread. A total of 11,222 tons of heat-dried biosolids in the form of pellets from the Blue Lake WWTP in Shakopee was produced for land application in 2006. In the past year, the Empire WWTP green roof was completed as part of a major plant expansion. The plant is located adjacent to the Vermillion River, a designated trout stream. The Metropolitan Council designed the plant's stormwater management practices to both protect the river and the trout habitat as well as to serve as a demonstration of innovative stormwater management. Along with the green roof, which covers a portion of the RAS (reverse activated sludge) Pump Building, the stormwater management system includes two large infiltration basins with native plantings, a native plant garden, permeable pavers, and vegetated drainage swales. The RAS green roof serves several purposes:

- Intercepts and eliminates runoff from 1,800 square feet of impervious area for storms up to 1.5 inches of rainfall.
- Removes nutrients from stormwater and runoff for storms over 1.5 inches of rainfall (which discharges from the roof overflow).
- Reduces summer cooling costs for the building.
- Its height of four feet above the sidewalk makes it a uniquely observable demonstration project.
- It is aesthetically pleasing.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) – Water conservation devices installed in 2002 continue to reduce water consumption by approximately three million gallons per year as compared to pre-installation usage—a savings of approximately $25,000 in FY2007. During FY 2007 a new dishwashing machine was installed in the campus food service building. The new equipment recycles water between washing operations and also pulps solid wastes and removes them before being discharged to the sewer. Both these features significantly reduce water consumption as compared to the equipment it replaced.

Minnesota State University, Moorhead – A computer managed watering system is utilized on the athletic fields, 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 stormwater detention pond and underground drainage system is managed under the university's stormwater pollution prevention program. This system significantly reduces the amount of contaminated runoff directly flowing into the city's storm sewer and ultimately into the Red River of the North. An energy audit was recently conducted by Energy Services Group with a focus on a water usage assessment.

St. Cloud State University – This past year, progress continued on replacing systems to reduce water use.

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.

North Hennepin Community College – Plumbing fixtures and supplies with lower gallon per minute ratings are used at this facility whenever possible, depending upon the application requirements. Chemically treated water systems like our boiler water, and cooling tower chemical treatment systems, as well as closed loop heating and cooling systems for this college are properly isolated from potable water supply by approved antisiphon devices (RPZ).

Department of Transportation (Mn/DOT) uses 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 trap and sediment trap management procedure for disposing of wastewater that meets regulatory requirements while being 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, including less watering and energy use.

University of Minnesota – The Water Resources Center (WRC) (http://wrc.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) – MMD, in conjunction with the SAO and the MPCA, 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. MMD wrote the contracts for the Automatic External Defibrillators to require the contract vendors selling hospital supplies to accept the expired rechargeable batteries for recycling. PMD recovers and recycles all refrigerants. PMD composts yard waste whenever practical.

MMD's refrigerants contract offers environmentally friendly alternatives to Freon. MMD, in conjunction with the Office of Enterprise Technology, has established a contract for Lucent equipment that offers both new and refurbished telecommunications equipment. Agencies can choose to purchase refurbished equipment. 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.

The Materials Management Division helped the Minnesota Pollution Control Agency implement the Get the Mercury Out Now! Program, which aims to remove elemental (liquid) mercury and mercury-containing equipment from Minnesota's public and private middle schools, and junior and senior high schools. MMD solicited quotes from the current state of Minnesota contractors for hazardous waste management service and contracted with two of the current HW contractors to execute the program. There have been several extremely costly spills of mercury in schools in the past few months. The goal is to have as many Minnesota schools as possible free of mercury and mercury-containing equipment by January 1, 2008. Get the Mercury Out Now! gives each of the schools the opportunity to get rid of its elemental mercury and mercury-containing equipment and to have the equipment replaced with a limited amount of mercury-free equipment at no cost to the school.

MMD established contracts for plastic bags that had the following requirements: bags do not contain lead, will be nontoxic when incinerated, when disposed of in a landfill, or composted, and whenever possible, to be made with post-consumer recycled content. Consideration during the award was also given to the percentage of post-consumer recycled paper in the package that contains the bags.

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 treatment required for water that would contain an elevated level of BODs and suspended solids.

MCF-Shakopee - Four living unit buildings (out of 9 units) have removed paper towels and replaced with hand dryers. Additionally, multiple recordkeeping and audit forms that had been completed using paper have now been switched to electronic formats.

MCF-Oak Park Heights is now recycling all foam products, including mattresses and pillows.

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) – 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. 2005 is the second year of successful biofilter operation.

Minnesota Army National Guard – 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, 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 MNARNG staff, controls these funds. Pollution prevention projects funded by this account include purchase of new garbage/recycling trucks.

Minnesota Pollution Control Agency – The Alliance for Recycling and Reduction of Waste (ARROW) committee at MPCA promotes waste reduction, recycling, and sustainability within the agency. ARROW has coordinated composting efforts at the agency since 1999 and has implemented recycling programs for hard-to-recycle materials such as batteries, computer disks, transparencies, and video tapes. ARROW also coordinates an e-bulletin board for reuse and two annual "treasure table" events that promote the reuse and free exchange of unwanted items.

For the calendar year 2006, ARROW helped the agency recycle or compost over 70% of what was discarded at the MPCA. Several ARROW internal education campaigns promoted increased recycling and paper reduction over the past two years. ARROW has also advocated for energy-efficiency initiatives, promoting transportation alternatives and the hiring of agency staff dedicated to promoting sustainability.

MPCA RECYCLING AND COMPOSTING RESULTS (IN POUNDS FOR CALENDAR YEAR)

	2000	2001	2002	2003	2004	2005	2006
White & pastel office paper*	52,013	47,648	81,003	96,374	99,350	73,713	95,466
Mixed paper	42,556	38,984	N/A*	N/A	N/A	N/A	N/A
Corrugated cardboard	15,580	9,723	8,696	11,891	10,722	7,799	10,114
Cans, glass, plastic	9,876	6,414	5,427	5,163	4,333	2,974	3,804
Compostable organics	26,754	16,680	16,640	18,400	24,000	24,000	20,840
Laser printer toner cartridges	560	600	1,013	1,090	1,050	965	1,040
Typing ribbons/cartridges	25	N/A	N/A	N/A	N/A	N/A	N/A
Metal (mostly from recycled	2,250	4,640	14,534	34,105	15,109	18,816	16,363
Batteries (auto and appliance)	285	157	29	600	45	51	84
Fluorescent lights	85	50	375	570	387	0	450
Reusables (including office supplies, calendars/pictures and paper bags)	1,180	976	1,459	0	0	0	0
Other plastics (Tyvek, transparencies)	106	210	143	137	73	88	90
Techno trash	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other recyclables/reusables not included in total	4,491	0	0	0	0	0	0
Total recyclables/reusables	151,270	126,082	129,319	168,330	155,069	128,406	148,251
Trash	53,149	63,640	35,725	40,370	64,350	50,000	62,500
Trash + reusables recyclables	204,419	189,722	165,044	208,700	219,419	178,406	210,751
MPCA recycling rate	74.00%	66.46%	78.35%	80.66%	70.67%	71.97%	70.34%

* From 2002 on the mixed and office paper are reported together.

In 2007, the Brainerd regional office worked with the property owner to install a 5,000-square-foot rainwater garden. Staff assisted with the design and planting of native plants and seed. The rainwater garden collects and treats stormwater runoff from nearby parking lots.

Also, the office swapped out two vending machines and replaced them with one energy-efficient vending machine. The office has also formed a healthy snacks committee that buys products from a local food co-op and encourages locally grown and marketed products and materials. This office is also contributing to alternative energy sources by buying wind power for our office electricity.

Minnesota State Colleges and Universities (MnSCU)

Bemidji State University (BSU) continues as a member of the National Wildlife Campus Ecology program,

initially joining in the spring of 2006. BSU established an endowment fund through the BSU Foundation that allows individuals and/or groups donating money to the foundation to designate their contribution for support of environmentally sustainable programs. The fund will be used for student scholarships and to support projects related to environmental sustainability. Thanks to a major contribution from Otter Tail Power Company, the fund became fully endowed in 2007 with over $10,000 in funds.

Minnesota State University, Moorhead has developed a stormwater pollution prevention program (SWPPP) in order to minimize the harmful effects of stormwater runoff and its potential to affect the water quality of the Red River of the North. The SWPPP includes public outreach, education, and involvement; controlling illicit discharges; maintaining clean construction sites; and pollution prevention and good housekeeping measures. Some of the year's activities are listed below.

Students helped post stormwater informational pamphlets, brochures, and other educational materials at several public locations throughout the university campus. A student intern created brochures specific to the university's stormwater program, including hotline numbers to call both the university and the city of Moorhead so community members can report concerns of potential stormwater pollution. The Department of Environmental Health & Safety's stormwater website, featuring not only the university's programs and info, but also local, state, and federal stormwater information, continues to be further developed and updated by students. Physical Plant staff attended stormwater pollution prevention training sessions, which also included table top discussions on various spill scenarios and response procedures. In cooperation with the Sustainable Campus Intiative Committee, featured speakers included stormwater education at public lectures during Earth Week. In conjunction with Earth Week, MSUM had its annual campus cleanup event involving students, faculty, staff, and administrators helping clean lawns, parking lots, landscaped areas, storm drains, boulevards, etc. promoting the event as a means to also minimize potential stormwater pollution from runoff. University community members attended public informational sessions involving stormwater educational presentations, brochures, pamphlets, and open discussions. All campus parking lots and roadway storm drains were stenciled by students educating the general community warning not to dump anything into the drains, as it may eventually drain into the Red River. Students put up posters around campus educating university community members to monitor parking lots and grounds and report potential sources of stormwater contaminants by calling a hotline phone number. Students working with the Dept. of Environmental Health & Safety were trained on stormwater drain inspections and took part in assisting the Physical Plant with the process.

Physical Plant employees responsible for university grounds received training on stormwater impacts from lawn care, landscaping,S and pest control applications. Procedures are in place for vehicle and lawn equipment washing requiring it be accomplished within interior wash bays. Procedures are in place involving regular parking lot and sidewalk cleaning with machine sweeping and vacuuming removing surface sediment and debris. MSUM has in place an on-going storm drain inspection and cleaning program that includes storm drain grates, detention pond, pump station, catch basins, and other appurtenances. Evaluation in the use of alternative products, primarily pesticides and herbicides, continues to be investigated to minimize contaminated stormwater . MSUM primarily utilizes sand as an alternative to salt when addressing icy sidewalks and parking lots, minimizing pollutant runoff, and in addition, the sand is swept up each spring and reused. Hazardous material storage areas are inspected on a regular basis. Hazardous material storage areas are enclosed, utilize spill prevention, and are provided with secondary containment systems and spill response. This past year, an Emergency Spill Response Program was further developed that included updated training with Physical Plant staff in providing better preparation towards addressing hazardous material spill response. Exterior signs are placed in problem areas reminding neighboring pet owners to collect their animal's fecal waste and place it in a proper receptacle. A vehicle maintenance program reminds drivers of both fleet and service vehicles to regularly inspect their vehicles and report any maintenance concerns to the Physical Plant.

St. Cloud Technical College allows and encourages individuals and students to drop off waste oil, oil filters, batteries, tires so SCTC can recycle them also to help the environment. We charge a small waste disposal fee to off set these costs to everyone having cars repaired in our vehicle labs. The SCTC library makes use of scrap paper that has only been printed on one side by cutting it up and turning it into note paper for reuse by staff and student workers. We make sure to shred any paper that might have confidential information.

St. Cloud State University continues to recycle glassware from the Biology stockroom due to the ongoing initiative of a very supportive faculty member.

North Hennepin Community College – Stains from the biology labs are no longer sewered, approximately 25 gallons per year are collected and sent for fuel blending/energy recovery through the Minnesota State Hazardous Waste contract.

Department of Transportation (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 associated 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 developed a procedure to address all containers found in Mn/DOT right-of-way. The department developed a safe, practical, and cost-effective procedure to manage this material, much of which is recycled. Mn/DOT is a strong advocate of electronic communication (e-mail and teleconferencing), which results in energy and product savings.

Mn/DOT's Office of Transit is launching ArriveMN, a statewide public information service during the third week of September 2007. The launch unveils a web site and uses three awareness building events to showcase ArriveMN that will provide a single point of reference for travel throughout the state. This information service will feature a number of transportation options (public transit, bicycling, and car and van pooling) that can have a positive impact on pollution reduction.

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 have worked 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–Stormwater Pollution Prevention Plan: The university has developed a stormwater pollution prevention plan and a municipal separate storm sewer system permit application for the Twin Cities Campus (www.dehs.umn.edu/envircomp_swm.htm) in order to meet stormwater 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 runoff. Finalizing the stormwater pollution prevention program was only the first step in protecting stormwater runoff on campus. Over the next few 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 de-ice sidewalks in winter. In response to the federal requirements, a university stormwater 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 stormwater . 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 stormwater pollution prevention plan.

The Commission on Environmental Science and Policy: The University of Minnesota's Commission on Environmental Science and Policy has completed its work and submitted a report to Executive Vice President

and Provost Robert Bruininks. The report is intended as a starting point for ongoing discussions about the university's efforts in environmental teaching, research, and outreach.

You're invited to read the report and recommendations, as well as the Commission's cover letter that identifies reasons why the report is important and some immediate steps the university should take. After reviewing these materials, your feedback is encouraged.

The Commission on Environmental Science and Policy (www.piere.umn.edu/enviro) was created by then 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. 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. The ideal is if we can find ways to manage farm operations in a way that doesn't affect yield but does that improve water quality. Nitrogen is also the major contributing factor to the spread of hypoxia, oxygen depletion, in nation's waters. Hypoxia occurs in the Gulf of Mexico, at the mouth of the Mississippi River, where aquatic life is severely compromised because of chemical runoff.

Fiscal Year 2007 **Activity type**	Department of Administration	Department of Agriculture	Department of Commerce	Department of Corrections	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council– Environmental Services	Metropolitan Mosquito Control	Minnesota Army National Guard	Minnesota Pollution Control Agency	Department of Transportation	University of Minnesota	Department of Employ & Econ Dev. No Matrix	DOER	MN State Colleges and Universities
Absorbents	FY/07			FY/07 O/P	O	O	O/Q		O		O	O			O
Adhesives	FY/07								O						O
Air quality, CFCs	FY/07	O		FY/07 O/P		O	O		O		O	O			O
Antifreeze	FY/07			FY/07 O/P	O	O	O		O/Q		O	O			O
Audits	FY/07			FY/07 O/P		O	O		O/Q		O	O			O
Auto fuels	FY/07	O	FY/ 07 O/P/Q	FY/07 O/P/Q	O	FY/07 O/P/Q	O	FY/07 O	O/Q	FY/07 O	O	FY/07 O	P		O/Q
Auto maintenance	FY/07		FY/ 07 O/P	FY/07 O/P	O	FY/07 O/P/Q	O	O	O		O	O			O/Q
Batteries	FY/07		FY/ 07 O	FY/07 O/P	O	O	O/Q		O/Q	O/Q	O	O			O/Q
Cleaning supplies	FY/07	O		FY/07 O/P/Q	O		O		O	O	O	O/P			O/Q
Commuting & transportation	FY/07		FY/ 07 O/Q	FY/07 O/P	O		O/Q		O	O/Q	O	FY/07 O/P	FY/07	FY/07 O/P	O/Q
Education, comm. & training	FY/07	O		FY/07 O/P		O	O	O	O	O/P	O	FY/07 O/P			O
Electronics	FY/07		FY/ 07 O	FY/07 O/P	FY/07 Q	O	O		O	O	O	O	P	FY/07 O/P	O/Q
Energy– lighting	FY/07			FY/07 O/P	FY/07 Q	O	O/Q		O	O/Q	O	O		FY/07 O/P/Q	O/Q
Energy – production	FY/07		FY/ 07 O/P	FY/07 O/P			O/Q			O	O	FY/07 O/P/Q			O/Q
Groundwater wells	FY/07			FY/07 O/P			O		O						O
Heavy metals	FY/07	O		FY/07 O/P			O/Q		O	O	O	O			O/Q
HVAC, indoor air quality	FY/07			FY/07 O/P	O	O/P			O	O	O	FY/07 O/P			O/P
Ice control, sanding	FY/07			FY/07 O/P	O	O			O	O	O	O			O/Q

Fiscal Year 2007 **Activity type**	Department of Administration	Department of Agriculture	Department of Commerce	Department of Corrections	Iron Range Resources & Rehabilitation	Metropolitan Airports Commission	Met Council–Environmental Services	Metropolitan Mosquito Control	Minnesota Army National Guard	Minnesota Pollution Control Agency	Department of Transportation	University of Minnesota	Department of Employ & Econ Dev. No Matrix	DOER	MN State Colleges and Universities
Laboratory	FY/07	O	FY/ 07 O	FY/07 O/P			O			O	O	O			O/Q
Landscaping	FY/07			FY/07 O/P	O					O		FY/07 O/P			O/P
Materials exchange	FY/07			FY/07 O/P		O	O			O	O	O			O
Office supplies	FY/07 Q	O/Q	FY/ 07 O/Q	FY/07 O/P/Q	FY/07 Q	FY/07 O/P/Q	O/Q	O/Q	O/Q	O/Q	O/Q	O/Q	Q	Q	O
Oil, oil filters	FY/07				O	O	O/Q		O/Q		O	O			O
Paints, coating, stripping	FY/07			FY/07 O/P		O	O		O/Q	O	O	O			O
Parts cleaning	FY/07				O	O	O/Q		O			O			O
Personal care	FY/07										O				O
Pesticides, fertilizers	FY/07	O		FY/07 O/P					O		O	O			O
Policy statement	FY/07	O	FY/ 07 O	FY/07 O/P	O	O	O		O	O	O	O	FY/07		FY/07 O
Printing	FY/07		FY/ 07 O/P/Q					FY/07	O	O/Q	O	O	FY/07		FY/07 O
Procurement	FY/07	O		FY/07 O/P	O	O	O		O	O/Q	O	O		FY/07 O/P	FY/07 O
Remanufactured parts	FY/07				O	O				O	O				FY/07 O
Tanks	FY/07		FY/ 07 O	FY/07 O/P	O	O	O		O		O	O			O
Technical support	FY/07			FY/07 O/P	O	O	O		O	O	O				FY/07 O
Tires	FY/07			FY/07 O/P	O	O	O		O/Q		O	O			O
Water treatment	FY/07			FY/07 O/P		O	O/Q		O	O	O	O			FY/07 O
Other	FY/07			FY/07 O/P			O			O/Q	O	O			

FY07 = fiscal year 2007 O = ongoing P = planned Q = quantifiable data available