State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary

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December 7, 2009

Mr. David Naftzger
Executive Director, Great Lakes-St. Lawrence River Basin Water Resources Council
Secretary, Great Lakes-St. Lawrence River Basin Water Resources Regional Body
c/o Council of Great Lakes Governors
35 East Wacker Drive, Suite 1850
Chicago, IL 60601

Subject: Water Management Program Report and Water Conservation and Efficiency Program Report
Submitted on behalf of the State of Wisconsin

Dear Mr. Naftzger:

On behalf of the State of Wisconsin, please find enclosed a Water Management Program Report; and, a Water Conservation and Efficiency Program Report that is being sent pursuant to and in satisfaction of the obligations included in Section 3.4 of the Great Lakes-St. Lawrence River Basin Water Resources Compact.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Matt Frank
Secretary
Wisconsin Department of Natural Resources
Alternate of Governor Doyle, Member, Great Lakes-St. Lawrence River Basin Water Resources Council

cc: Peter Johnson, Program Director, Council of Great Lakes Governors

2009 Water Conservation and Efficiency Program Report
Wisconsin Department of Natural Resources

December 8, 2009

Agency Contacts:

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Status of Conservation & Efficiency Goals and Objectives:

Wisconsin has adopted water conservation and efficiency goals and objectives that are consistent with the Basin-wide goals and objectives. A stakeholder advisory group developed the goals and objectives during a series of meetings during 2008. The goals and objectives (attached as Appendix 'A') can be found on the Department website at: http://dnr.wi.gov/org/water/dwg/ReportRegionalBody_11_18_08.pdf.

Water Conservation & Efficiency Program Overview:

The Wisconsin Legislature ratified the Great Lakes—St. Lawrence River Basin Water Resources Compact in 2007 Wisconsin Act 227. Act 227 contains additional water conservation and efficiency requirements in Wisconsin that go beyond what is required by the Compact. These requirements are codified in §281.346 (8), Wis. Stats.:

§281.346 (8) STATEWIDE WATER CONSERVATION AND EFFICIENCY. (a) *Goals and objectives.* The department shall specify water conservation and efficiency goals and objectives for the waters of the state and for the waters of the Great Lakes basin. The department shall specify goals and objectives for the waters of the Great Lakes basin that are consistent with the goals under s. 281.343 (4b) (a) and the objectives identified by the Great Lakes council under s. 281.343 (4b) (a) and (c). In specifying these goals and objectives, the department shall consult with the department of commerce and the public service commission and consider the water conservation and efficiency goals and objectives developed in any pilot program conducted by the department in cooperation with the regional body.

(b) *Statewide program.* In cooperation with the department of commerce and the public service commission, the department shall develop and implement a statewide water conservation and efficiency program that includes all of the following: 1. Promotion of environmentally sound and economically feasible water conservation measures through a voluntary statewide program.

1m. Mandatory and voluntary conservation and efficiency measures for the waters of the Great Lakes basin that are necessary to implement subs. (4), (4s), (5), (5m), and (6) and s. 281.348.

2. Water conservation and efficiency measures that the public service commission requires or authorizes a water utility to implement under ch. 196.

3. Water conservation and efficiency measures that the department of commerce requires or authorizes to be implemented under chs. 101 and 145.

(c) *Great Lakes basin program.* No later than the 24th month beginning after the compact's effective date, the department shall implement a Great Lakes basin water conservation and efficiency program as part of the statewide program under par. (b), for all users of the waters of the Great Lakes basin, that is designed to achieve the goals and objectives for the waters of the Great Lakes basin that are specified under par. (a). The department shall include in the Great Lakes basin program the activities in par. (b) 1. to 3. applicable in the Great Lakes basin and application of the water conservation and efficiency measures specified under par. (d) in subs. (4) (f) 6. and (g) and (6) (c).

(d) *Water conservation and efficiency measures.* The department shall promulgate rules specifying water conservation and efficiency measures for the purposes of implementing par. (b). In the rules, the department may not require retrofitting of existing fixtures, appliances, or equipment. The department shall specify measures based on all of the following:

1. The amount and type of diversion, withdrawal, or consumptive use and whether the diversion, withdrawal, or consumptive use exists on December 8, 2008, is expanded, or is new.

2. The results of any pilot water conservation program conducted by the department in cooperation with the regional body.

3. The results of any assessments under sub. (11) (d).

The Water Use Section of the Wisconsin Department of Natural Resources, Bureau of Drinking Water and Groundwater is developing a statewide water conservation and efficiency program that is based on Wisconsin's adaptation of the Great Lakes Regional Conservation and Efficiency Objectives. The program will require mandatory water conservation and efficiency measures for new or increased withdrawals in the Great Lakes Basin and for any user proposing to divert water from the Great Lakes Basin. Voluntary water conservation and efficiency measures will continue to be encouraged for existing water users in the Basin and for new and existing water users in the rest of the state. This program will be implemented through administrative rules, water use permits, and guidance developed in cooperation with the Wisconsin Department of Commerce (DCOMM) and the Public Service Commission of Wisconsin (PSC). These rules will establish best management practices by water use sector.

In addition, water supply service area plans for public water supply systems must consider water conservation alternatives when identifying options for supplying water. These plans are required by 2026 for all public water systems in Wisconsin serving populations of 10,000 or more; and are required immediately for Great Lakes Basin public water systems serving 10,000 or more and seeking a new or increased withdrawal.

Appendix 'B' contains a list of water conservation and efficiency items already implemented in Wisconsin. These items will be incorporated into the overall implementation strategy.

Promotion of Environmentally Sound and Economically Feasible Water Conservation and Efficiency Measures:

DNR and its partner agencies will promote water conservation and efficiency measures by identifying best management practices for different water use sectors. For those users that are required to implement water conservation and efficiency measures, the Department will, by rule, prescribe a standard analysis or procedures by which a water user may determine the environmentally sound and economically feasible best management practices to implement.

A water conservation and efficiency education and outreach strategy will be developed and implemented by DNR and its partner agencies to promote best management practices and realize per capita reduction of water use in Wisconsin.

Menu of Demand Side Initiatives for Water Utilities:
In 2006, Wisconsin compiled a Menu of Demand Side Initiatives for Water Utilities (Attached as Appendix 'C'). This document identifies demand-side best management practices available to water utilities, and can be used to help plan water conservation programs.

Program Implementation Timeline and Status:

December, 2008	Completed Wisconsin adaptation of Great Lakes Water Conservation and Efficiency Objectives
July, 2009	Hired DNR water conservation and efficiency program coordinator
October, 2009	Completed program implementation strategy draft
January, 2010	Begin DNR administrative rule drafting
January, 2010	Form administrative rule advisory committee
June, 2010	Establish DNR water conservation and efficiency website
October, 2010	Establish draft best management practice guidance
December, 2010	Final DNR administrative rules
December, 2011	Water use permits required for all Great Lakes Basin water withdrawals averaging 100,000 gallons-per-day or more in any 30-day period. Mandatory water conservation and efficiency requirements for users requesting a new or increased withdrawal above the 100,000 gallons-per-day threshold after 12/8/2008 will be applied through the water use permits.

Appendix A

Wisconsin Adaptation of the Great Lakes Objectives:

1) Improve monitoring and standardize data reporting among state and provincial water conservation and efficiency programs. Collect information that will assist with understanding the waters of the Basin and how these waters are used, and share accurate and comparable information with the public and other states and provinces.

a) Identify and map all streams, lakes, rivers, ponds, springs, wetlands and major groundwater systems including major recharge areas.
b) Monitor water resources and water use patterns to identify and track regional trends.
c) Collect, analyze and report water use information from all user groups.
d) Develop predictive methods for evaluating how the waters of the Basin may be used in a sustainable fashion.
e) Monitor the implementation of best management practices and other efforts to promote sustainability.
f) Make information readily available to the public, including providing information about the waters of the state and water use on a state web site.

2) Adopt and implement supply and demand management to promote efficient use and conservation of water resources. Communicate how to most efficiently use the waters of the Basin.

a) Identify best management practices for different categories of water users.
b) Coordinate water use efficiency and conservation programs within the state.
c) Coordinate water use efficiency and conservation programs with ongoing energy efficiency programs and other efforts to reduce greenhouse gas emissions.
d) Develop a mechanism to communicate the importance of water use efficiency and conservation practices with water users.

3) Guide programs toward long-term sustainable water use. Sustain the quantity and quality of the waters of the Basin.

a) Use adaptive programs that are goal-based, accountable and measurable.
b) Develop administrative rules for new and increased uses and diversions as defined in the Compact.
c) Develop specific conservation and efficiency requirements for new and increased uses and diversions as defined in the Compact.
d) Engage users and coordinate with agencies, tribal governments and other government officials.
e) Fund activities associated with understanding, communicating, planning, and promoting the sustainable use of the waters of the Basin.

f) Periodically review the status of the waters of the Basin, how they are used, and the effectiveness of the management practices.
g) Develop a water conservation and efficiency program for improving the sustainability of the quantity and quality of the waters of the Basin.
h) Develop a process for maintaining and improving the understanding, communicating, planning, and promoting of the waters of the Basin.
i) Develop administrative rules when necessary to implement the water conservation and efficiency program.
j) To the extent possible, seek public input on water conservation and efficiency policies and programs affecting the management and use of the waters of the Basin.
k) Seek a greater understanding of tribal traditional knowledge and practices regarding the importance of water and its sustainable use.

4) Develop education programs and information sharing for all water users. Promote improved understanding of the importance of water.

a) Improve public awareness of the importance of water conservation and efficiency.
b) Emphasize educating school children, businesses, and government officials on the economic, societal, and ecological values of water, including sustainability.
c) Seek opportunities to share traditional knowledge and practices of Wisconsin tribes.

5) Develop science, technology and research. Develop innovative and timely approaches to address emerging water management issues.

a) Encourage the development of water-related industries and technologies to position Wisconsin as a global industry leader.
b) Identify research and monitoring needs related to the interaction of groundwater and surface waters, and strategies for managing and protecting groundwater.
c) Promote the development of systems and tools for an integrated approach to groundwater and surface water that would predict the effects of water withdrawal, management, and conservation and efficiency practices within the Basin.
d) Leverage the resources of Wisconsin's research institutions to focus on problems affecting the human and natural communities of the Great Lakes, including analyzing barriers to sustainable water use.
e) Foster cooperation and sharing of resources and information among all federal, tribal, state and local agencies as well as with international partners.

Appendix B

Inventory of Wisconsin Water Conservation and Efficiency Program Elements

Wisconsin law regulates the withdrawal, distribution, treatment, use, and disposal of water. This inventory identifies existing authorities and programs of the Department of Natural Resources (DNR), Department of Commerce (DComm), and the Public Service Commission of Wisconsin (PSC) that are part of the State of Wisconsin's water conservation and efficiency efforts. These include both mandatory and voluntary water conservation and efficiency requirements.

SUMMARY OF PROGRAM ELEMENTS

Planning

Wellhead Protection Program. A wellhead protection plan, that includes a water conservation program, is required on all new municipal wells. The conservation program can be mandatory or voluntary, and the types of practices or activities that must be included are not specified. DNR guidance suggests promoting water saving fixtures, conducting water loss surveys, and enacting ordinances restricting outdoor water use.

Reference: NR 811.16(5), Wis. Adm. Code
Agency: DNR

Stormwater Planning. DNR, in consultation with the Comm, is required to establish a state storm water management plan. The purpose of the plan is to promote the efficient use, conservation, development and protection of this state's groundwater, surface water, soil and related resources while encouraging economic growth.

Reference: 281.33, Wis. Stats.; NR 216
Agencies: DNR, Comm

Safe Drinking Water Loan Program. Funds provided under this program can be used to develop water conservation plans, water rates, and water system ordinances. As a condition of receiving assistance under the safe drinking water loan program, municipalities are required to develop and adopt a water conservation program, as specified by DNR. Neither statute nor rule specify the measures that should be included as part of the water conservation program.

Reference: 281.61(8m), Wis. Stats.; NR 166.07, Wis. Adm. Code
Agency: DNR

Clean Water Loan Program. Funds provided under this program can be used for wastewater conservation.

Reference: 281.58(14)(5), Wis. Stats..
Agency: DNR

Construction Approval. Public water utilities and combined water and sewer utilities are required to obtain a PSC certificate of convenience and necessity before constructing, acquiring, or operating certain types of plants, including wells, other sources of supply, pumping stations, treatment facilities, storage facilities, and buildings. Although current practices do not require or include an evaluation of the extent to which proposed construction could be avoided through conservation measures, one of the factors that must be considered as part of PSC's review is whether the proposed projects would "provide facilities unreasonably in excess of the probable future requirements."

Reference: 196.49(3), Wis. Stats.; PSC 184, Wis. Adm. Code
Agency: PSC

Water Use Regulation

High Capacity Wells. Construction, reconstruction, and operation of a high capacity well or a dewatering well requires approval by the DNR. DNR may place conditions on its approval restricting the location, depth, pumping capacity, or rate of flow of the well to avoid impairing the water supply of a public utility.

Reference: 281.34(5), Wis. Stats.; NR 812.09(4), Wis. Adm. Code
Agency: DNR

Groundwater Protection Areas and Springs. DNR may place conditions on the approval of a high capacity well located near a spring or within 1,200 feet of an outstanding resource water, exceptional resource water, or a trout stream to ensure that the well will not have a significant environmental impact. These conditions may include but are not limited to location of the well, depth of the lower drillhole, depth interval of the well screen, pumping capacity, pumpage schedule, months of operation, rate of flow, ultimate use, and conservation measures.

Reference: 281.34(5), Wis. Stats.; NR 820.30, NR 820.31 Wis. Adm. Code
Agency: DNR

Surface Water Withdrawals. Permits are required for withdrawals from a stream for the purpose of maintaining the normal level of a navigable water body or for agriculture or irrigation. Permits are also required for any withdrawal from a stream or lake for any purpose that results in a loss of more than 2,000,000 gallons per day in any 30-day period. DNR must specify on each permit issued the quantity of water that may be diverted and the times during which water may be diverted.

Reference: 30.18, Wis. Stats.
Agency: DNR

Withdrawals Resulting in Water Loss or Interbasin Diversion. New or increased withdrawals from the waters of the state resulting in water loss averaging more than 2,000,000 gallons per day in any 30-day period require approval by DNR. Applicants are required to demonstrate that their current water use and proposed new or increased water use incorporates reasonable conservation practices. For withdrawals that result in an interbasin transfer of surface water, applicants must demonstrate that they have implemented measures to manage and conserve existing water resources and that further use of existing water resources would be impracticable or would have substantial adverse economic, social, or environmental impacts.

Reference: 281.35, Wis. Stats.; NR 142.06, Wis. Adm. Code
Agency: DNR

Metering

High Capacity Wells. DNR may require high capacity well owners to measure and calibrate the static and pumping well water levels and to report this information monthly.

Reference: NR 812.39(2), Wis. Adm. Code
Agency: DNR

Public Water Supplies. All public water supplies, except other–than–municipal water systems having source capacity less than 70 gallons per minute, are required to install a water meter at each source to accurately measure the daily quantity of water pumped or delivered. Metering is also required for all Community water systems utilizing chemical addition.

Reference: NR 811.11(4), Wis. Adm. Code
Agency: DNR

Public Water Utilities. Public water utilities are required to meter all water sold or consumed, except for water used for fire protection, street or sewer flushing, construction, or similar purposes where metering is not practical. For these uses, the amount of water consumed may be estimated.

Reference: PSC 185.31, Wis. Adm. Code
Agency: PSC

Meter Testing and Replacement . PSC establishes meter accuracy requirements, procedures for meter testing and replacement, and minimum frequencies for meter testing for public water utilities. Utilities are required to keep records of meter testing results.

Reference: PSC 185.61, 185.71, and 185.76, Wis. Adm. Code
Agency: PSC

Water Use Reporting

Community Water Systems**.** Municipal water systems are required to report monthly the quantity of water pumped each day. Other-than-municipal water systems having a groundwater source capacity exceeding 70 gallons per minute are required to report monthly the quantity of water pumped each month and static and pumping groundwater depth measurements.

Reference: NR 811.05(2), Wis. Adm. Code
Agency: DNR

High Capacity Well Reporting. Wells owners pumping more than 100,000 gallons of groundwater per day from all wells on their property are required to report monthly pumping statistics to DNR on an annual basis.

Reference: 281.34(5) and (6), Wis. Stats.; NR 820.13, Wis. Adm. Code
Agency: DNR

Withdrawal Registration and Reporting. Any person withdrawing an average of more than 100,000 gallons per day in any 30-day period is required to register that withdrawal with DNR. The registration must specify the source of the withdrawal, the location of discharge or return flow, and the location and nature of the water use. In addition, any person that is required to register their withdrawal is also required to annually report the actual or estimated average annual and monthly volumes and rates of withdrawal and the actual or estimated average annual and monthly volumes and rates of water loss resulting from the withdrawal. This requirement applies to any withdrawal from the "waters of the state", which includes both surface water and groundwater.

Reference: 30.18, Wis. Stats.; NR 142.03, Wis. Adm. Code
Agency: DNR

Public Water Utilities**.** Public water utilities are required to keep records of the amount of water pumped into the distribution system each day from each station. This information is reported to the PSC as monthly totals as part of the annual reporting process. Also, utilities are required to report the volume of water sold by customer class (e.g., industrial, Commercial, residential, public authority) as well as an estimate of the amount of water used for utility operations such as main and hydrant flushing. Utilities that withdraw water from the Great Lakes are also required to report this information to DNR.

Reference: PSC 185.44, Wis. Adm. Code
Agency: PSC

Efficiency/Water Loss

Plumbing Code Requirements. The Wisconsin Uniform Plumbing Code establishes standards for all plumbing within the state. These standards require that lavatory faucets, showerheads, urinals, urinal flushing devices, water closets, and water closet flushing devices not exceed published maximum flow rates. In addition, COMM requires that plumbing systems be designed and adjusted to use the minimum quantity of water consistent with proper performance and cleaning.

Incentives/Rebate Programs. While there is no statewide incentive program for replacing older, inefficient toilets, the PSC is working with a number of local utilities to establish rebate programs for the purchase of high-efficiency WaterSense toilets. These programs are funded through utility revenues.

Water Accounting and Loss Control. Public water utilities are required to minimize system losses and to keep records of the volume of water pumped and sold. Unaccounted for water (e.g., leaks, meter inaccuracies, theft) must be less than 25 percent of total pumpage for Class C and D utilities and less than 15 percent of total pumpage for Class AB utilities.

Reference: PSC 185.85, Wis. Adm. Code
Agency: PSC

Pressure Management. PSC establishes standards of pressure for public water utilities. Under normal conditions, the pressure at the residential fixture cannot be less than 20 p.s.i.g and the pressure at the customer meter cannot exceed 125 p.s.i.g. Water loss caused by leaks from distribution and storage facilities may be minimized by reducing excessive pressures.

Reference: PSC 185.82, Wis. Adm. Code
Agency: PSC

Pricing/Water Rates

Billing. Water charges must be based on meter readings. Readings can occur monthly, bimonthly, quarterly, or for other periods authorized by law. Utilities are required to provide at least one year of consumption information upon customer request.

Reference: PSC 185.32, Wis. Adm. Code
Agency: PSC

Water Rates. PSC regulates both private and publicly owned water systems, and is authorized to establish reasonable and just rates for water service that allow the utility to furnish reasonably adequate service. Current law does not require PSC or water utilities to consider conservation and efficiency as part of the rate-setting process. However, PSC encourages utilities to adopt rates that are intended to promote conservation and efficiency to the extent that such rates are deemed to be just and reasonable under existing procedures.

Reference: Ch. 196, Wis. Stats.
Agency: PSC

Reuse and Recycling

Wastewater Permits**.** Wastewater reuse is not specifically addressed under Wisconsin law. However, industrial and domestic wastewater can be applied to fields under a Wisconsin Pollutant Discharge Elimination System permit, which indirectly allows for the reuse of wastewater for irrigation.

Reference: NR 110, NR 113, NR 206, NR 214, and NR 243 Wis. Adm. Code
Agency: DNR

Graywater Reuse and Stormwater Harvesting. Since 2003, Commerce has recognized and encouraged graywater reuse and stormwater harvesting by enacting changes to the plumbing code. In general, the reuse of blackwater (wastewater from toilet and urinal flushing) is prohibited because of public health concerns.

Reference: 82.10 and 82.34, Wis. Adm. Code
Agency: Comm

Labeling. Systems that convey non-potable water, such as treated wastewater for reuse, must be properly labeled.

Reference: 82.40(3)(d), Wis. Adm. Code
Agency: Comm

Plan Review. Plumbing plan review is required for any system that is intended to infiltrate stormwater, harvest rainwater for use, or reuse wastewater. Comm's website contains a "Plumbing Product Register" that lists approved devices and systems for these purposes.

Reference: 82.20, Wis. Adm. Code
Agency: Commerce

Underground Injection Control. Construction or use of a well to store or dispose of storm water runoff directly into groundwater is prohibited under the Underground Injection Control (UIC) program. Under the UIC program, construction or use of a subsurface fluid distribution system for dispersal of storm water runoff into unsaturated material overlying the uppermost underground source of drinking water shall be done in a manner that complies with the groundwater standards in Ch. NR 140, Wis. Adm. Code, complies with the requirements of Ch. Comm 82, Wis. Adm. Code, and does not result in the endangerment of an underground source of drinking water.

Reference: NR 815, Wis. Adm. Code; COMM 82, Wis. Adm., Code
Agency: DNR, Commerce

Education and Outreach

Commerce's Division of Safety and Buildings conducts training sessions on various plumbing-related topics and has created publications that are available on the Commerce website.

PSC conducts outreach and training to public utilities related to rate-setting, improving efficiency of operations, and reducing water losses from distribution systems. PSC has also created pages on its website that provides information to utilities and public on water conservation practices, with links to additional information.

DNR conducts a variety of education programs to help people of all ages understand and appreciate our state's natural resources. Water-specific efforts include Project WET, groundwater model teacher workshops, groundwater study guide, lake monitoring, and water action volunteers. Multiple publications are available on the DNR website along with information for ordering hard copies where available.

Miscellaneous

Stormwater Infiltration. New residential and non-residential construction that disturbs more than one acre is required to incorporate measures designed to infiltrate stormwater. The purpose of this requirement is to limit runoff, recharge groundwater supplies, and improve surface water quality.

Reference: NR 151.12(5), Wis. Adm. Code
Agency: DNR

Water Quality Standards. State wetland water quality standards require the maintenance of dry season stream flow and groundwater flow into, out of and through wetlands. These standards apply to any project requiring a permit that may impact water quality or wetlands.

Reference: NR 103.3(1)(b), Wis. Adm. Code
Agency: DNR

Focus on Energy. This program works with eligible Wisconsin residents and businesses to install cost effective energy efficiency and renewable energy projects. Focus on Energy's projects include efforts to achieve energy savings through reduced residential hot water use and improved industrial and Commercial water use efficiency. This includes working with water and wastewater utilities to improve efficiency of their pumps, motors, and processes. Beginning in 2010, Focus on Energy will offer rebates statewide for the purchase of water and energy efficient appliances such as dishwashers and clothes washers.

Reference: 25.96, Wis. Stats.
Agency: PSC

WaterSense Program. PSC and DNR have joined EPA's WaterSense program as promotional partners. In this role, the agencies will encourage public water utilities to join the partnership to promote water efficiency. The program is voluntary and identifies water saving products

and services that meet efficiency and performance standards. PSC and DNR can use the WaterSense program logo on information and educational materials.

Reference: None
Agency: PSC

Appendix C

REPORT TO GOVERNOR DOYLE

Water Conservation

A Menu of Demand Side Initiatives for Water Utilities

♦ September 2006 ♦

The Honorable Jim Doyle:

A year ago you announced one of the most sweeping environmental conservation packages in Wisconsin history. You laid out a plan in your Conserve Wisconsin Agenda to safeguard Wisconsin's great environmental legacy.

The Public Service Commission of Wisconsin (PSC) and the Department of Natural Resources are pleased to have significant roles in the Conserve Wisconsin Agenda which focused on three main areas: protecting Wisconsin's waters, conserving our lands and ensuring a sustainable energy future.

One of the many initiatives in the Conserve Wisconsin Agenda called on our agencies to work closely with stakeholders to develop a menu of demand side water conservation initiatives. The report will provide the basis for a larger effort at hand to develop a comprehensive strategy for all the Great Lakes States.

We are pleased to provide you with *A Menu of Demand Side Initiatives for Water Utilities*, a report that explores the many options available to water utilities to sustain our valuable water resources. We appreciate the opportunity we have had to work with the dedicated and knowledgeable stakeholders, representing water consumers, environmental groups, utilities and local government. Their input during the development of this report has been invaluable in creating a useful water conservation tool for Wisconsin water utilities and their customers.

It is our hope that this report will help launch effective water conservation efforts around the state. Thank you for the leadership and vision you have provided in the Conserve Wisconsin Agenda. We look forward to continuing our efforts to preserve our environment for future generations.

Dan Ebert, Chairperson
Public Service Commission of Wisconsin

Scott Hassett, Secretary
Department of Natural Resources

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Report to Governor Jim Doyle
A Menu of Demand Side Initiatives for Water Utilities

As part of his Conserve Wisconsin Agenda, Governor Jim Doyle directed the Department of Natural Resources (DNR) and the Public Service Commission of Wisconsin (PSC) to work with interested stakeholders to identify a menu of demand side initiatives to reduce water use in Wisconsin. This report discusses the resulting menu and is issued at a watershed moment for Wisconsin. Pockets of the state have experienced dropping groundwater levels and major water conservation policy efforts are underway to protect the state's valuable water assets. It is critical that this resource be managed in a way that promotes sustainability.

The menu of demand side initiatives was developed from the information provided at the Governor's Water Conservation Symposium in Sheboygan, Wisconsin, on May 23, 2006. Nationally recognized water conservation experts from across the country shared information on best practices and lessons learned on a wide array of water conservation issues. This was the first symposium of its kind in Wisconsin where local and state officials, water utility managers, consumers and environmentalists had the opportunity to come together for a day and discuss water conservation issues.

Although the water conservation menu is aimed at utilities, it provides useful information for all water consumers, even those on private wells. Approximately two-thirds of Wisconsin's water consumers get their water from utilities.

In addition, although sustainability of the resource explicitly or implicitly underpins every action taken by the state's water utilities, no two Wisconsin water utilities have the same set of water use issues or circumstances. The comprehensive list of water conservation initiatives is designed to provide flexibility for Wisconsin water utilities as they work on their own individual water conservation strategies in the following areas:

- **Water Conservation Education** - The report points out that education alone won't maintain water conservation gains, but it is an integral part of any water conservation effort.

- **Water Use Accountability** - Measurement is a key to efficient use of water and Wisconsin utilities, unlike many other states' utilities, have been metering water sales since the early 1900's. The report illustrates the need for continued and new measurement methods that allow for benchmarking and assessment of conservation activities.

- **Water-Saving Hardware** - More efficient plumbing and water flow restrictors are the actions most frequently taken to conserve water because they do not usually rely on the consumer to curtail use on an ongoing basis.

- **Water Conservation Rates -** Pricing signals may be effective tools to help water utilities with water conservation goals and may encourage customers to purchase and use water-conserving appliances and fixtures. However, water utilities and environmental advocates both identified the ability of large industrial water consumers to "opt out" of the utility and build their own wells if water rates are too high as a major barrier to these types of pricing signals.

- **Water Reuse and Recycling -** Using a water supply that meets the minimum quality requirements for the intended purpose provides efficiency and preserves water resources. An example would be the higher quality standards for drinking water versus the standards required for landscape watering.

The advisory stakeholder group that worked with the PSC and DNR on the Symposium and the menu included water utilities, consumers, environmental groups and business and industry. The group recommends that the agencies take advantage of the momentum of water conservation activities initiated by the Governor's Water Conservation Symposium and this report. Suggestions include public education on the menu of water conservation activities described in this report, collecting baseline data on water use to measure future water conservation efforts, and further development of a statewide water conservation education program.

It is important to note that the menu resulting from the Symposium is a first step that should be reviewed in concert with the Governor's other major water conservation efforts:

- Governor Doyle chairs the Council of Great Lakes Governors and is leading the effort to develop a comprehensive water management strategy to protect an internationally significant water resource – the Great Lakes. Part of the strategy requires that each state develop a water conservation plan.

- Governor Doyle signed 2003 Wisconsin Act 310, creating the Groundwater Advisory Committee to address the management and sustainability of Wisconsin's groundwater resources.

Wisconsin is blessed with an abundant and unique supply of water. This menu of demand side initiatives acknowledges the critically important role water has in the ongoing prosperity of the state and its citizens, and the responsibility that flows to those who consume the resource. The initiatives should be used where appropriate to ensure the continued, unqualified availability of the state's water for future generations.

INTRODUCTION

A Key Step in Sustainable Water Use

In August 2005, Governor Jim Doyle launched Conserve Wisconsin, a bold package of legislation and executive orders aimed at safeguarding Wisconsin's great environmental legacy. The package calls for protecting our water, conserving our land, and ensuring a sustainable energy future.

> *"Wisconsin's natural resources are not just part of our economy or what we do for recreation…they're a fundamental part of who we are, and we owe it to future generations to be vigilant in our protection of them."*
> *Governor Jim Doyle*

As part of Conserve Wisconsin, the Governor called on the Wisconsin Department of Natural Resources (DNR) and the Public Service Commission of Wisconsin (PSC) to work with water utilities, regional government, environmental groups and industrial consumers to develop a menu of demand side initiatives to reduce water use in the state.

This report represents the work of the stakeholders, the PSC and the DNR to provide demand side water management strategies for water utilities in Wisconsin.

Protecting Wisconsin's Water Resources

Wisconsin is blessed with an abundant water resource. It is one of the natural resources the DNR works to protect and enhance in its mission to provide a healthy and sustainable environment for Wisconsin citizens. In addition to Conserve Wisconsin, Governor Doyle has directed the DNR to lead two major initiatives aimed at protecting the Great Lakes and Wisconsin's groundwater.

- Great Lakes - St. Lawrence River Basin Sustainable Water Resources Agreement
- Wisconsin's 2003 Groundwater Quantity Law, Act 310

Wisconsin's Water Resources

- 84,000 miles of rivers
- 5.3 million acres of wetlands
- 1,000 miles of Great Lakes shoreline
- 15,000 lakes
- Groundwater resource – 100 feet deep if it covered the state's surface

As Chair of the Council of Great Lakes Governors, Governor Doyle is leading the implementation of the recently signed agreement between the Great Lakes States and Provinces to manage the internationally significant Great Lakes as a whole. Some of the key components of the agreement call for a uniform standard to guide water use, a ban on diversions with limited exceptions, and a requirement that each state develop a comprehensive water conservation program consistent with the regional conservation and efficiency goals. A Wisconsin Legislative Council study on how to implement the agreement has just begun.

Additionally, the Governor signed 2003 Wisconsin Act 310, creating the Groundwater Advisory Committee. The Committee has begun its work addressing complex and challenging issues surrounding groundwater management to protect against depleting Wisconsin's groundwater reserves.

A menu of demand side initiatives to reduce water use complements these two ongoing efforts, and is an important additional step in Wisconsin's efforts to protect the Great Lakes and our groundwater resources. The conclusions from this report to Governor Doyle will be provided to the groups participating in other parallel efforts addressing water conservation in Wisconsin for further consideration and implementation.

> *"Recent groundwater legislation and regional Great Lakes agreements re-emphasize the need for all of us in Wisconsin to reduce the impact of our water use on our rivers, lakes and wetlands. Water utilities are a key supplier of water, so as a first step, Governor Doyle has called for ideas for how water utilities can reduce water use."*
>
> *Todd Ambs, Administrator, DNR Water Division*

Demand Side Initiatives for Water Utilities

Demand side initiatives (programs) consist of planning, implementing and monitoring activities of water utilities that are designed to encourage consumers to modify their level and pattern of water usage. The primary objective of most demand side initiatives is to provide cost-effective water supply that defers the need for developing additional sources. Fundamental to demand side management is the conservation of water through reduced customer demand to benefit consumers, the environment and utility suppliers.

Wisconsin water utilities withdraw over 600 million gallons of water per day to supply domestic, industrial and commercial users. It is important to note that the self-supplied industry withdraws over 400 million gallons of water per day. This initiative chose to focus on water utilities because they account for a significant portion of the water withdrawn in Wisconsin. However, a comprehensive state water conservation and efficiency program will need to address all sources of water withdrawal and their impacts on the states water resources.

Regulation of Water Utilities Unique to Wisconsin

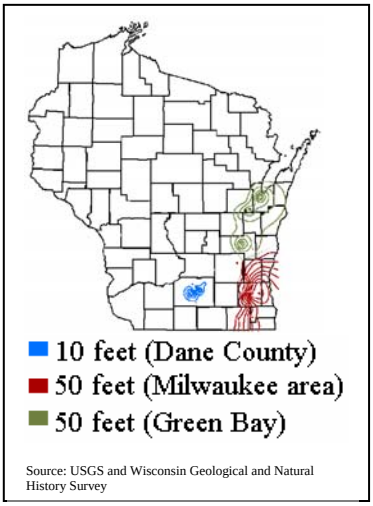
The PSC regulates public utilities that provide water, sewer, electricity, steam, natural gas and telecommunication services. It was the first entity in the nation to regulate all types of public utilities.

> *"Wisconsin water utilities are already engaged in conservation efforts, including the prevention of water loss, water preservation and protection and management of water resources, and they have been for many years."*
>
> *PSC Chairperson Daniel Ebert*

Today, Wisconsin regulates public water systems more comprehensively than any other state in the nation, with oversight of investor-owned utilities and nearly 600 municipal water utilities. Two-thirds[1] of Wisconsin's water consumers get their water from utilities while the remainder draw from private wells.

Unlike many other states, Wisconsin requires metering of all water sales which is a key water conservation mechanism. Meter testing standards are also in place to ensure meter accuracy. Another important water conservation tool that Wisconsin practices is a water loss prevention program. This program encourages and assists water utilities in identifying and repairing system leaks.

Different Utilities in Wisconsin Face Different Challenges



No two utilities in Wisconsin have the same set of circumstances. For example, Milwaukee and Waukesha are just miles apart, yet Waukesha faces the challenge of meeting the water demands of an ever-growing population from a diminishing water source while Milwaukee has excess capacity and an abundant supply of water from Lake Michigan.

The challenge for utilities to provide adequate quantity of water is often exacerbated by water quality problems. Radium, arsenic and dissolved solids are all examples of naturally occurring contaminants that have caused water supply problems for some water utilities in Wisconsin.

Over the last century, growing demand for water has contributed to long-term drops in groundwater levels that affect the quantity and quality of water available to some communities.[2] Groundwater has been drawn down several hundred feet around Waukesha and Brown Counties. In Dane County, groundwater levels have dropped as much as 60 feet

[1] Ellefson, B.R., G.D. Mueller, and C.A. Buchwald. 2002. *Water Use in Wisconsin 2000*. USGS Open-file Report 02-356. http://wi.water.usgs.gov/pubs/ofr-02-356/ofr-02-356.pdf

[2] Results from three groundwater flow models show extensive water level declines from pre-development conditions. Large groundwater withdrawals from the Green Bay (green) and Milwaukee Metropolitan (red) areas have resulted in extensive cones of depression that have coalesced and extend past the Illinois border (not shown). The declines are large because the aquifer storage is confined and water is obtained from leakage from overlying rock units, lateral flow from distant sources, and aquifer storage. The Dane County cone of depression (blue) is smaller in extent because withdrawals are primarily being fed by local sources of water (such as lakes, streams and wetlands) that are in direct contact with the aquifer.

and are expected to drop more as the population continues to grow.[3] While the physical characteristics of the groundwater aquifers these communities draw from affect the rate and extent of drawdown, these examples demonstrate the significant problems already present in some areas of the state and are illustrative of what could happen in other areas as they grow.

Governor Doyle's Water Conservation Symposium, a First for Wisconsin

Over 125 people gathered in Sheboygan, Wisconsin, on May 23, 2006, to listen to national water conservation experts and share ideas on how to use demand side water management tools to reduce water use in Wisconsin. The Symposium was the first of its kind in Wisconsin and is the basis for this report.

> *"Given the Earth's limited water budget, conservation is essential if we are to build a water trust, an endowment that generations to come can rely on for their own security and prosperity."*
> *Amy Vickers, author of Handbook of Water Use and Conservation*

National experts participating in the Symposium are listed below. Summaries of their presentations are part of this report.

- **Dr. Janice Beecher**
  Director of the Institute of Public Utilities, Michigan State University
  Presentation Title: The Role of Price in Water Conservation

- **David Broustis**
  Senior Program Manager for Urban Water Conservation, Seattle Public Utility
  Presentation Title: A Comprehensive Water Demand Management Program: Seattle's Saving Water Partnership

- **Cheryl K. Davis**
  Director, Water Supply and Treatment, San Francisco Public Utilities Commission
  Presentation Title: Message from a Dry State

- **Amy Vickers**
  President of Amy Vickers & Associates, Inc., International Consultants on Water Conservation
  Author of Handbook of Water Use and Conservation
  Presentation Title: The "ABCs" of Water Conservation - Demand Side Strategies: The Current Experience - A Global View

(A webcast of the Symposium is available at http://psc.wi.gov/. Click on "Water Conservation" under the Conserve Wisconsin logo.)

[3] It is important to note that although the drawdown for Waukesha and Brown Counties is higher, those aquifers are deeper than that in Madison.

ADVISORY GROUP

Alliance of Cities
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Wisconsin Department of Commerce
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Midwest Food Processors Association
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Waukesha County Environmental Action League
Steve Schmuki

Waukesha Water Utility
Dan Duchniak

Wisconsin Rural Water Association
Ken Blomberg

Wisconsin Water Association
Tom Bunker

Wisconsin Wildlife Federation
George Meyer

The Stakeholder Partnership

Stakeholder input was invaluable in developing the menu of demand side initiatives for water utilities. Representatives of Wisconsin water utilities, regional government, environmental groups and industrial consumers came together to explore new ideas in managing water demand and to collectively identify strategies for reducing water use in Wisconsin.

"Water conservation means different things to different people."

Tom Bunker, Racine Water Utility

"This is not just about how we can save water, but how we can use water in a sustainable way. It provides flexibility for communities to develop sustainable water resources."

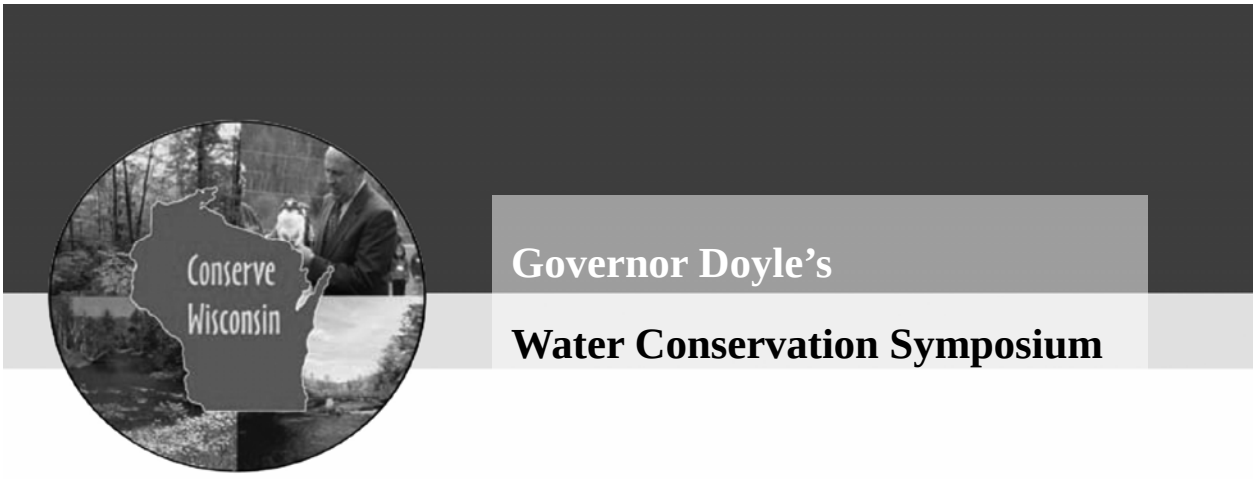
Jodi Habush-Sinykin, Midwest Environmental Advocates

A Menu of Demand Side Initiatives to Reduce Water Use in Wisconsin

This report discusses the many demand side water management tools available to water utilities and explores the economic, environmental and social aspects connected to the different strategies. It is based on the presentations and discussions at the Governor's Water Conservation Symposium and on input from stakeholders representing a broad spectrum of interests.

Since every water utility faces different challenges, a "one-size-fits-all" approach will not work in Wisconsin. This report identifies the many different management strategies that can help individual communities, and Wisconsin generally, use water more efficiently. Different combinations of strategies will be useful in different communities based on community needs. This menu is an important piece of a package of ideas (including the results of the Groundwater Advisory Committee work, the Council of Great Lakes Governors' efforts for developing regional water conservation and efficiency goals, and the translation of these goals into a Wisconsin program) for developing a comprehensive state water conservation program.

This menu is an important first step in protecting our water resources, a critical asset in Wisconsin.



As part of the Water Conservation Initiative in Governor Doyle's Conserve Wisconsin Agenda, the PSC and DNR sponsored a statewide Symposium on demand side management strategies. The Symposium is the basis for this report to the Governor.

Over 125 people, including utility managers, local and state government officials, environmentalists and other interested people attended the Symposium which was held at the Blue Harbor Conference Center in Sheboygan, Wisconsin, on May 23, 2006.

The Symposium provided an overview of how water demand side conservation efforts fit into a variety of events and activities including the 2003 groundwater legislation, Groundwater Advisory Committee efforts, and the recently signed Great Lakes Water Quantity Agreements. Each nationally renowned speaker presented perspectives on effective conservation efforts in the United States and addressed water conservation issues unique to Wisconsin. Their complete presentations, including PowerPoint presentations, can be found on the water conservation website at http://psc.wi.gov.

A summary of each presentation in the order presented follows:

Amy Vickers
The "ABCs" of Water Conservation - Demand Side Strategies: The Current Experience - A Global View

More and more, *water conservation is an imperative, not an option*. From a global to the local view, the state of the world's water in both quantity and quality is in trouble. Every day, in every major region of the world, a growing portion of the world's expanding population bears witness to drought and long-term water shortages. By 2025, water shortages are projected to impact over 2.5 billion people worldwide. Further, global warming and rising temperatures are expected to increase evaporation, giving us even less fresh water in the future.

Water utilities that have "mined" their "water waste" through aggressive and comprehensive water conservation programs have achieved remarkable results that are preserving water supplies and in some cases savings consumers hundreds of millions of dollars. The Massachusetts Water Resources Authority (Boston, MA) reduced its total average demand from 340 million gallons per day (mgd) in 1988 to 225 mgd in 2005 – a 115 mgd system-wide savings (34%) that saved the utility over $800 million in avoided new supplies. Similarly, New York City's average 1.5 billion gallons per day (bgd) demands in the

early 1990's have been reduced to less than 1.1 bgd today. NYC's conservation efforts saved over 400 mgd system-wide (27%) and canceled a $1 billion wastewater treatment plant expansion. These two examples demonstrate what many other U.S. water systems also have the potential to achieve: over 30% system-wide demand reductions are possible when a true commitment is made to water conservation.[4]

How can water utilities realize significant savings from conservation such as those achieved by the MWRA and NYC? The right mix of water-thrifty policies, plans and programs directed at every category of water user. *There are hundreds of ways to save water – permanently*. Here are some examples:

- *Water Utilities* – Reduce system leakage and losses (Unaccounted-for Water) to a maximum of 10%. Repair leaking customer service lines. Meter and limit – and in some cases, prohibit – withdrawals from private wells. Make private wells subject to the same local water efficiency restrictions that apply to public water system customers. Establish inclining rate structures and seasonal water use surcharges.

- *Residential Customers* – Install high efficiency fixtures and appliances. Fix leaks. Limit lawn watering to a maximum of 1 or 2 days per week. Shut off irrigation systems that violate watering rules. Reduce area allowed for irrigation. Prohibit run-off. Promote natural lawns and landscapes. Educate the public about the hazards of lawn chemicals (nearly 70 Canadian cities and towns ban them) and also their link to high water use.

- *Industrial, Commercial and Institutional/Public Customers* – Prohibit once-through cooling. Optimize water-based heating and cooling systems. Fix leaks. Install high-efficiency plumbing fixtures, appliances, and air-cooled equipment.

In sum, we are just beginning to tap our potential to boost the productivity of water. Words alone do not conserve water; water savings from conservation are achieved by taking practical actions and installing efficiency measures. Pursue water conservation, not just water *conversations*. Are you going to pursue conservation or complacency? The choice is yours.

David Broustis
A Comprehensive Water Conservation Program - Seattle's Saving Water Partnership

David Broustis presented the comprehensive water conservation program implemented by Seattle Public Utilities.

Seattle Public Utilities (SPU) provides water and water conservation services to over 1 million citizens of the Puget Sound region of Washington State. SPU provides water to the City of Seattle and sells water wholesale to 17 local water districts, who then sell it to their customers. The system supplies an annual average of approximately 130 million gallons of water per day. Although it has a reputation for rain, the region receives about 35 inches of rain per year and has dry summers, with drought conditions

[4]The savings associated with these programs seem dramatic because of the adoption of metering. However, Wisconsin has been metering for over 100 years. Conservation methods discussed in this report may not produce the same percentages of savings because Wisconsin water sales are already metered.

every 5–10 years. SPU has been offering comprehensive water conservation for over 15 years. Most of SPU's water supply comes from two watersheds, supplemented by limited ground water.

Seattle Public Utilities has implemented water conservation programs for a number of reasons. In addition to the typical reasons such as environmental protection and delay of new supply, unique drivers include local legislative mandates, Native American tribal agreements and, more recently, uncertainty over climate change.

Water savings have been categorized as originating from one of three ways: Codes, Rates and Conservation. Code savings originate primarily from 1992 Federal regulations that mandate efficient fixtures such as toilets, urinals, showerheads, and faucet aerators. Rate savings are derived from billing structures that encourage efficiency. These include a summer differential for both commercial and residential customers (reflecting high irrigation demand) and tiered residential rates that increase with increasing volumes of water consumed.

In the pursuit of water conservation savings, Seattle Public Utilities has identified the primary driver (uncertain long-term supply), the goal (stable system water consumption), the plan (Conservation Potential Assessment), and the tool (program implementation with targeted annual savings). The Conservation Potential Assessment (CPA) is a unique plan that examines dozens of possible conservation "measures" and their associated cost/cost effectiveness. The CPA includes both efficiency measures (installing weather-based irrigation controllers) and behavioral measures (washing full loads of laundry). The output of the CPA is a ranking of which conservation programs can provide the greatest total volume of savings and which measures can be implemented at the lowest cost. Conservation program costs are a small percentage of overall water costs and are funded through both annual operation and maintenance budgets, as well as long-term capital spending.

The conservation identity is known as the Saving Water Partnership. Water conservation program occurs across three sectors: indoor residential, commercial, and irrigation/landscape. Residential indoor programs are tasked with approximately 50% of the total program savings. Residential program offerings include rebates for high efficiency clothes washers, a free efficient plumbing fixture program for multifamily housing (toilets, showerheads, faucet aerators), a free efficient showerhead distribution, a single-family educational effort encouraging the purchase of high-quality toilets, and comprehensive assistance for low-income customers.

Commercial conservation programs reflect the fact that many commercial and industrial (C&I) customers have unique water uses. Efforts focus on replacement with more efficient equipment, changes to waterless processes, water reuse/recycling, catered technical assistance, and repair/adjustment/modification of existing equipment. Some of the standardized efficiency measures offered to the commercial sector include toilet/urinal rebates, food service pre-rinse spray valves, and efficient laundry equipment installation. While commercial efforts are offered to the entire sector, specific emphasis is placed on the top 100 customers, known as the "key accounts."

Landscape programs focus on both the commercial and residential sectors. Incentive programs are available for the installation of weather-based controllers and rain sensors. Large users are eligible for irrigation efficiency audits. Significant effort is placed on customer efforts that increase the likelihood of water savings lasting for the long-term. This includes establishing an ethic of low water use through using better soils, planting drought-tolerant plants, and putting the right plant in the right place (sun, shade). Recognizing that the benefits of efficient landscape irrigation practices has multiple benefits,

some of the funding for these efforts originates from solid waste (mulching of lawn clipping) and hazardous waste/surface water management (chemical use/runoff of lawn chemicals) programs.

Educational efforts across all sectors include historical consumption information on utility bills, newsletters with conservation information, "umbrella" marketing of efficiency to the broad media, school education, promotion of efficient behaviors, and the establishment of a comprehensive website, www.savingwater.org.

Combined, the result of these efforts is a water system that uses the same volume of water as the 1970's, despite over 30 years of increase in population. While conservation goals and actual savings fluctuate from year to year, the program continues to meet savings targets through program adjustments, as necessary.

In an attempt to identify similarities to the efforts the State of Wisconsin is embarking upon, a brief overview of recent Washington State water efficiency efforts was presented. In Washington, the Department of Ecology issues water rights. These water rights tend to be difficult to acquire and require source meters and conservation rate structures for municipal systems. The Washington Department of Health oversees water quality and water system plans and encourages system leakage rates under 20%.[5] A new legislative mandate to further statewide water conservation, the 2003 Municipal Water Law, requires Department of Health oversight of all water systems with 15 or more connections. Proposed elements include:

- Mandatory requirement for water use efficiency plans and programs, with larger systems requiring more measures
- A statewide standard of water distribution system leakage of under 10%
- All customers required to be metered within 10 years
- Water use efficiency goals established through a local public process
- Annual performance reporting of water usage, distribution system leakage, and progress toward efficiency goals.

Projecting the Washington State experience to efforts in the State of Wisconsin, Symposium participants were encouraged to identify their local/statewide demand management drivers and to identify the potential role of state government in these efforts. Some possible roles for the State include developing best management practices, setting per capita demand targets, and providing a supporting role through technical assistance, leak detection, and support/funding of local and regional conservation organizations and efforts. Looking forward, it was encouraged to look long-term, establish goals and baselines, focus on outcomes, and consider the path of least resistance. With regard to the last point, it was emphasized to minimize distribution system leakage first, to consider the most cost effective conservation efforts as a priority, and to do what other areas have found to be most (cost) effective.

When considering efficiency measures, go with proven technologies, evaluate programs for effectiveness, understand that new technologies come with risk of effectiveness, and place great emphasis on continuously building an ethic of conservation with all customers.

While conservation savings can be extremely effective when planned properly, there are challenges. These include the reality that reduced water use can impact revenues and that behaviors can be difficult

[5] See page 24 for Wisconsin's current water loss rates

to change. Revenue impacts can be minimized through shifting of some operational cost on the base meter rate and through steady metering of conservation savings across a number of years.

As Wisconsin moves ahead, it was encouraged to consider that demand management is a valuable customer service. Rather than a specified conservation program, a menu of options can be most effective to respond to local needs and concerns. When funding programs, it should be recognized that efficiency is indeed a reliable long-term source of supply and therefore can be paid for through capital funding. While critics to efforts will arise as efforts move forward, they can be silenced by communicating why efforts are taking place, and offering knowledgeable responses to concerns such as the unit-of-water rate impacts of conservation.

Cheryl K. Davis
Message from a Dry State

Cheryl Davis' presentation highlighted behavior conservation as a theory of rules. The rules that were addressed included (1) Rule of Partial Creationism, (2) Guarantee Rule, (3) Parallel Universe Rule, and (4) Perspective Rule

Rule of Partial Creationism – "We live partly in a world we inherit, and partly in a world we create."

As co-creators of our universe, sometimes we impact it in ways that are sometimes planned and unanticipated. Sometimes we contaminate groundwater through pollution. Sometimes we use groundwater at a level that exceeds the rate of replenishment. Thus, it might make sense to track usage statewide by watershed. Benchmarks can be used to monitor the impacts and think about where we are and where we are going. Concrete benchmarks allow you to tailor strategies that are specific to local situations.

Guarantee Rule – "There's nothing you can do to guarantee a good outcome, but there's plenty you can do to guarantee a bad one."

Given the facts about water and water supply and quality, there are some actions that Wisconsin should avoid. These actions include making water cheaper for people who use a lot, requiring water conservation only for new or large scale withdrawals, not tracking implementation of water conservation plans, discouraging use of recycled water for anything except irrigation, allowing big water users to opt out of municipal systems, and not worrying too much about ground water quality – just pump it and deliver it.

Parallel Universe Rule – "The best way to plan for our future is to plan for multiple futures."

Multiple scenario planning involves defining questions or issues (what approach we should take statewide to water supply and planning), identifying and ranking driving forces, identifying important uncertainties, developing possible scenarios, and looking for common elements that would be useful in a variety of situations. Multiple scenario planning helps you look for actions you can take today that will provide the greatest flexibility to respond to multiple outcomes.

Perspective Rule – "The best way to see what is in front of you is to look at multiple perspectives."

The Global Water Initiative, which defines the three bottom lines, developed the "triple bottom line" concept: economic, environmental and social. Economic are impacts on the economic circumstances of an organization's stakeholders and on the economic system at all levels. Environmental are impacts on living and non-living natural systems, including ecosystems, land, air, and water. Social are impacts on social systems within the organization. All conservation based decisions should be evaluated using the triple bottom line concept.

Dr. Janice Beecher
The Role of Price in Water Conservation

Water is essential to human life, so water utilities provide a very essential service. Water is renewable but finite and "transient in time and space." In other words, it is not always where you need it when you need it. Water utilities are highly capital intensive with much of their costs fixed, at least in the short-term. Economies of scale are very important. In the long-term, more of a water utility's costs are variable and efficiency can be strived for.

Price is a very important signal so both users and producers can make informed decisions, although price elasticity is relatively low for water. Water is still a relatively inexpensive utility service but the cost of water has been rising faster than the Consumer Price Index. The income of consumers and weather are more likely than price to affect the level of water consumption, especially for residential consumers. Full cost pricing sends important signals to customers but does not take into consideration other factors such as environmental externalities, resource depletion, and the ability of low income users to pay. Therefore, changing the price of water may have broader implications beyond the efficient allocation of the resource.

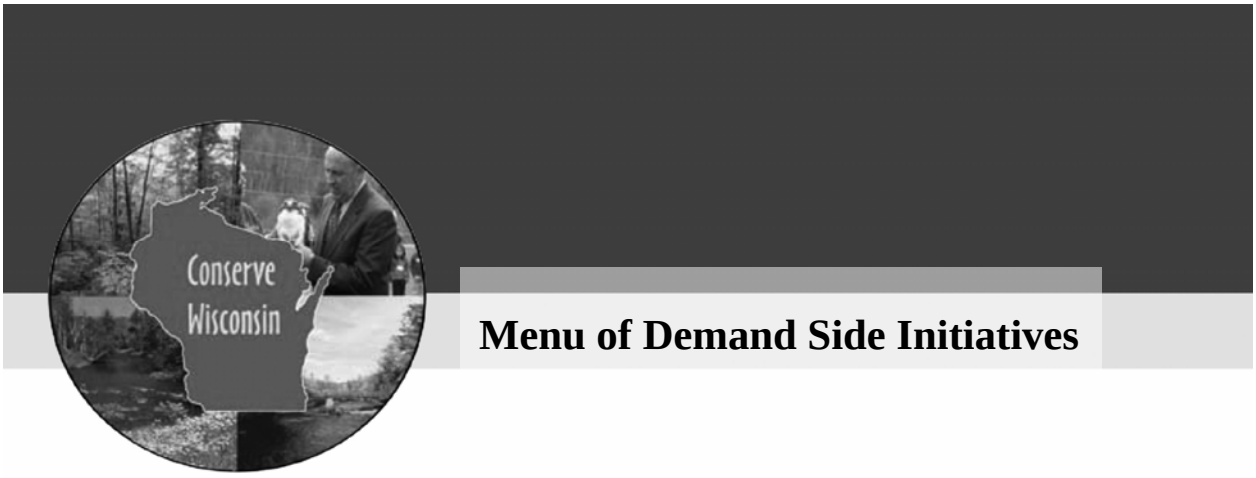
Economic regulation emphasizes full cost pricing so that the revenue requirement and cost of service study demands are reflected in "just and reasonable" rates. The cost causers should pay for the benefits they are receiving by using water. At the same time, overpricing and underpricing must be avoided or utilities will not earn the proper amounts of revenue and inefficient use of water will result.

Many different types of rate structures can be considering when pricing water such as:

- Uniform rate/uniform rate by class
- Decreasing-block rate
- Increasing-block rate
- Lifeline rate
- Seasonal rate
- Excess-use and budget based rates
- Applied marginal cost pricing (relevance of the tail block)
- Multi-tiered rates

When implementing rate changes it is important to communicate policy goals clearly, provide for stakeholder input, and phase-in changes gradually. Utilities must monitor and evaluate the results of the rate structure and modify rates based on their impacts and the outcome of the pricing structure.

Wisconsin has a long history of comprehensive regulation of water utilities. This regulation can provide standards and incentives but must continue to balance the interests of many parties. When implementing any type of conservation rate it is important to consider that one size does not fit all; efficiency can be elusive; and unintended economic, social, and environmental consequences can result.



Menu of Demand Side Initiatives

The menu presented here includes strategies aimed at managing the demand for water from public utilities. Some of the items would be implemented at the state level, however most are more suitably implemented by individual water utilities. These menu items represent flexible options that allow region-specific initiatives. The circumstances of individual communities vary widely in Wisconsin, a concept articulated frequently throughout the Symposium, and therefore not all of these measures will suit all communities. The need for flexibility in designing individual community programs to reduce water use is a critical concept to keep in mind while considering the options presented in this menu.

The menu was designed to create a list comprehensive enough to address all of the possible strategies that are likely to be useful in Wisconsin given the wide range of water supply and quality circumstances in the state. Some measures included on this list are not strictly demand side measures. Some appear to be supply side issues but, when reviewed carefully, are an integral part of any overall demand side initiative. Each initiative should be analyzed for its effectiveness drawing upon the "triple bottom line" concept of analyzing each alternative for its economic, environmental and social impacts. Through this menu of items, the PSC, DNR, and stakeholders identify key strategies to implement at the state and local level as appropriate to achieve the goal outlined in Governor Doyle's Conserve Wisconsin Agenda of reducing water use in Wisconsin.

The following categories were used to organize the demand side menu items identified by the stakeholders:

- Water Conservation Education
- Water Use Accountability
- Hardware and Physical Restrictions
- Water Rates and Related Issues
- Water Reuse and Recycling

Water Conservation Education

Education is a key component of water utility and state programs to reduce water demand. Education promotes public understanding and support of measures to reduce water demand, such as ordinances on lawn watering. It also promotes behavior change, such as consideration of water efficiency in purchases and practices in business or residential settings. The Symposium speakers all touched on the importance of education as one element in reducing water use. It was emphasized that education alone intending to promote behavior change is not sufficient for maintaining conservation gains, however, it does play a critical supporting role. The following is a list of education-related actions at the state and utility levels for consideration.

- **Water Conservation and Efficiency Education Audience**

  All water utility customers are a potential audience for education regarding water conservation and efficiency. However, messages, method of delivery and level of detail depend on the target audience and the purpose of education. Large water customers, commercial/industrial customers and residential customers are critical yet distinct audiences.

- **Water Conservation and Efficiency Education Messages**

  Informing utility consumers of the reasons for any conservation program, both mandatory and voluntary, is critical to ensure compliance or participation. Without adequate information, programs may have low compliance rates or low participation rates. The primary reasons for a conservation program will vary from community to community. There is a role for information dissemination at both the state and local level. State messages are broad messages, while local messages are more specific based on local issues and goals. Messages should be kept simple and tailored to address customer concerns. Some examples of the possible messages from the state or local level include:

    - State

      - Wisconsin is rich in water resources, however these resources are finite. To ensure Wisconsin's future prosperity and access to high quality drinking water and healthy rivers, lakes and wetlands, Wisconsin must use water prudently. Sustainability must be the goal.

- Wisconsin, along with the other Great Lakes States, needs to demonstrate efficient and responsible use of Great Lakes water as part of the recently agreed upon Annex Implementing Agreements which are management agreements intended to protect the Great Lakes Basin ecosystem. These agreements include a ban on diversions out of the Great Lakes Basin (with limited exceptions) and define a standard for water use within the Basin.

- Any serious discussion of public education messages for the purposes of impacting behavior needs to address specific target audiences, values-based messaging and analysis of available communication research and research needs.

▪ Local (examples of rationales that Wisconsin communities have for establishing water use and conservation programs)[6]

- Reduce the volume of wastewater to address capacity limitations
- Decrease impacts to local surface waters from groundwater withdrawals
- Address drawdown of groundwater resources
- Address water quality impacts resulting from quantity problems
- Delay costly construction of new supply (such as well or pipeline)

- **Water Bills – Monthly Usage, Historical Water Usage, Usage in Gallons**

  Water bills are a regular source of communication for utilities to their customers. Providing information such as current household water use, historical water use, water use by month and water use in gallons are ways of providing specific information to consumers on their water use. Currently, water bills are typically distributed quarterly as opposed to monthly, do not include historic water use, and often use unfamiliar units such as hundreds of cubic feet (ccf) rather than gallons. Adding this information to water bills provides feedback to consumers and is particularly relevant in conjunction with programs to encourage reduction in water use by customers.

  ▪ Factors to consider:

  - Currently, Wisconsin water utility customers are metered and billed based on their water consumption, providing useful information on consumption to customers. Providing additional, more-detailed and easier to understand information gives feedback to customers working to reduce water use and provides better information on a monthly basis for all water users to address unexpected increases in water use due to leaks or other reasons.

  - For many communities, providing additional information in new formats would require more frequent meter reading and changes to the process generating information included on the bill. These are potential expenses to the utility that should be weighed against the potential benefits.

[6] P.2. Additional reasons for implementing conservation and efficiency programs can be found in Amy Vicker's *Handbook of Water Use and Conservation*. 2001. WaterPlow Press. Amherst, MA.

- Providing additional information alone may not change behavior in water use.

- Water rates are typically low in Wisconsin, thus reducing water use will often not produce a significant decrease in water bills. Without a corresponding significant pricing signal, providing information on water use alone may not produce a significant reduction in water use.

- **Practices that Reduce Customer Water Use**

  There are a variety of ways that water utility customers can reduce their water use, which could include: business practices; industrial processes; choice in landscape planting; lawn watering practices; rain barrels; fixing leaks; and choice of fixtures and appliances such as toilets, urinals, shower heads, faucets, and washing machines.

  - Factors to consider:

    - Providing specific information to consumers on water saving technology or practices allows interested customers to make informed choices that are compatible with reducing water use. Simple actions identify methods for all customers to participate in programs to reduce water demand. More detailed information and individual education can assist the largest water users to make significant water savings.

    - Voluntary measures promoted through education tend to be insufficient for meeting goals to reduce water demand. Without corresponding pricing signals, local ordinances, or other standards, education may not be sufficient for customers to adopt the practices they learn about or to continue practices they try out. Water conservation from behavior changes tends to decrease over time and requires ongoing informational programs to maintain gains.

- **State Water Efficiency Coordinator – Water Efficiency Practice and Product Information**

  The Symposium speakers agreed that the specifics of conservation and efficiency programs should be determined by each community to meet local conditions. However, community programs and individual customers have a need for reliable, well researched information on water efficiency practices and technology. A coordinator could provide such information and could maintain an informational website as a resource for communities, businesses and individuals.

  - Factors to consider:

    - A state level coordinator would be a resource for all communities and customers providing information and expertise that could be used extensively at the local level. Good information for informed choices in technology and practices are critical for successfully meeting goals.

    - Many of Wisconsin's communities are very small and do not have the resources to independently research efficiency measures. A statewide coordinator could also provide analysis of the costs and benefits as communities design programs.

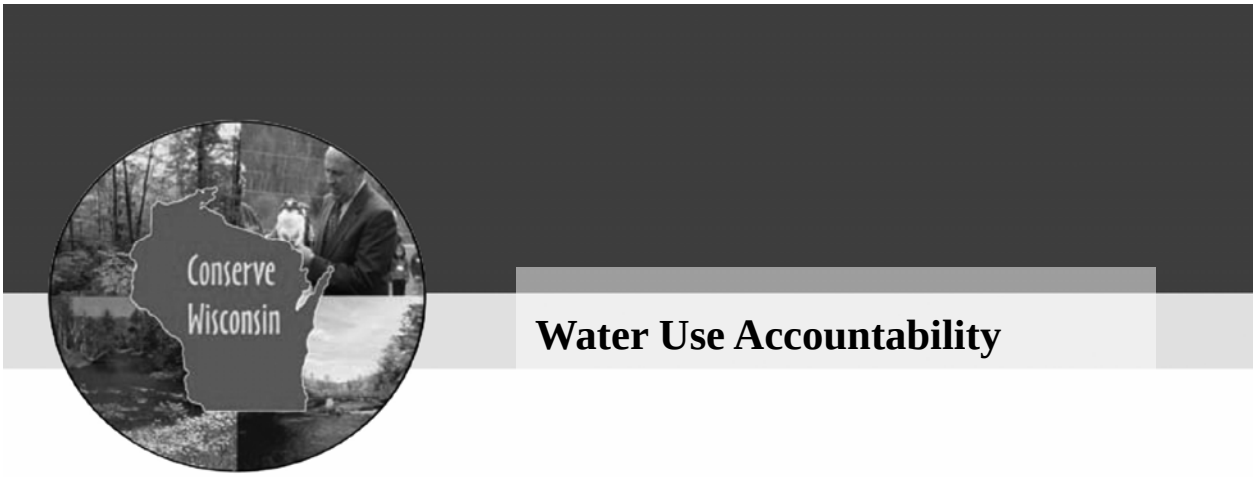
- **Maps Highlight Wisconsin Watersheds with Current or Future Water Supply Problems**

  Creating maps to visually display different water quality and quantity problems affecting Wisconsin's water supply was another recommendation from the Symposium. Maps might include the following information:

    - Areas of current groundwater drawdown
    - Areas with impacted surface water (streams, lakes, springs, wetlands) due to groundwater withdrawals
    - Areas with drinking water quality impacts caused or exacerbated by water withdrawals
    - Areas with problems due to lack of capacity for treating sewage
    - State water budgets for each watershed in the state

  - Factors to consider:

    - Maps provide graphical displays that are often easier for the public and decision-makers to readily understand. Such maps would be a useful format for conveying information.
    - It may be difficult to find consistent information that represents the status of different variables to present on such a map. Without consistent statewide data such maps may be misleading.



Accountability includes practices and policies that allow utilities and consumers to accurately track water sales and use. Measurement is key to efficiently using water. It includes knowing how much water is being supplied to the distribution system, who is using it, and how it is being used or lost. Through analysis and understanding of the water system, utilities can optimize their operations. Customers can adjust their water use to match individual goals or utility benchmarks concerning water use and/or loss. In Wisconsin, many of the conservation practices and policies noted below have been in use for many years. For example, metered water sales have been the standard for utility water sales since the early 1900's.

- **Metering Water Use**

  Metering is simply the active, accurate measuring of all water input and outputs on the distribution system. Metering in and of itself creates an incentive for conservation due to the fact that sales are based on the volume of water used. The more you use, the more you pay. Non-metered systems, on the other hand, bill customers on a flat fee basis so cost is not linked to use. Although there are a few exceptions, metering is the standard for all Wisconsin regulated public water utilities. (Wis. Admin. Code § PSC 185.31) Wisconsin has long maintained comprehensive requirements relative to the overall metering and recording of water use data. While public utilities meter water supply and sales, there is far less measurement and recording private water supply use.

  Other related variables to be measured are the rate and time of use at which water is consumed. This is also known as "demand" information. There are very few water systems in the state that have good data on water demand. If interest grows in demand-related rate structures, demand metering will be needed to support it.

- **Submetering Water Use**

  Submetering is the installation of secondary water meters downstream of the utility's master meter to measure for some private purpose the water use of individual dwelling units or other consumers. While submetering does track individual use more accurately and may be more equitable in a multi-unit situation, it can have limited benefit due to the cost of installing the meters as well as the ongoing operational costs such as meter reading and maintenance.

- Factors to consider:

    - There is no certainty that additional metering will result in a reduction of water use.

    - Additional metering may result in a more equitable allocation of water consumption in a multi-user environment.

    - The costs of installing submeters, as well as the ongoing costs of reading and maintenance, may be prohibitive if there is little or no assurance of a reduction in water use.

- **Water Meter Testing**

  Testing water meters at regular intervals ensures the ongoing, accurate measurement of water usage. Along with metering, Wisconsin has long-standing standards for meter testing and calibration. Water utilities can choose from several meter testing approaches set forth in Wis. Admin. Code PSC 185 Subchapter VII.

- **Water Use Reporting**

  While metering and meter testing are important tools in getting an accurate portrayal of water consumption, those results need to be reported effectively to have any appreciable affect. Wisconsin water utilities are already charged with keeping permanent meter history and test information under Wis. Admin. Code § PSC 185.19. Reporting water use among categories of users can be an effective way to evaluate who the large consumers are and also provide information about which consumers may be suitable for a water audit.

    - Factors to consider:

        - Not all water utilities will have the capability to evaluate water use by consumer category.

        - There is a potential cost to the utility of doing a more detailed review of water use among its consumers. Those costs may include labor, software, and administrative costs.

        - While the reports may provide accurate and important information, it may be ineffective if there is no mechanism in place to put the data to use. For example, making sure that a water audit program is in place to address consumers that fall outside of the range of "normal" residential or commercial consumption is of little value unless it gets communicated back to the customer in a timely manner.

- **Water Audits**

  Utilities can assist commercial and residential consumers in bringing their water consumption into clear focus and in curbing costs for that consumption. Before a measurable conservation plan can be implemented, it is important to get an accurate view of existing consumption.

  - Factors to consider:

    - There would be an increase in the workload of the utility and its staff to implement a water audit program. The increase in workload could be minimized by developing methods that allow the consumers to do much of the audit work themselves.

    - There is also the potential of increased costs of providing an audit program through personnel and other administrative costs. This could be offset by consumers' contribution to the auditing costs.

    - Water audits offer a great potential for a reduction in demand and water use among consumers who find that they can save water and costs by participating in a water audit program. Seattle offers a "Water Smart Technology Program" that offers financial incentives and technical assistance to industrial and commercial water consumers who reduce water use.

- **Leak Detection**

  Locating and repairing leaks as well as starting an ongoing leak detection program are important in reducing unaccounted for water use. Every water utility should have a leak detection and water loss program in place.

  - Factors to consider:

    - No utility should be without a leak detection and water loss program.

    - There will be costs and increased workload associated with creating a comprehensive and effective leak detection program, but ultimately, it may save the utility time and costs in other areas. With an effective leak detection program, there could be increased savings in pumping and distribution.

    - Leak detection and water loss programs also increase the reliability of the water utility.

- **Regulatory Oversight**

  Wisconsin is unique in that it regulates water utilities more comprehensively than other states. This is done through the Public Service Commission (PSC). The PSC has broad oversight over utilities including authority to require certain accountability measures. For example, in addition to its metering and testing requirements, the PSC works with utilities to identify "unaccounted for" water. Water systems serving more than 4,000 customers must have water loss under 15 percent. Water utilities serving fewer than 4,000 customers must not have greater than 25 percent water loss. The

2005 average water loss for all Wisconsin water utilities is 10.72 percent.[7] A current program identifies and works with water utilities that exceed these standards.

- Factors to consider:

  - The PSC also has the ability and the responsibility to incorporate conservation into its regulatory processes. Utilities are concerned about incurring additional regulatory requirements in connection with conservation.

  - There is also concern that conservation efforts will not be an allowable expense for recovery in a rate case.

  - These issues may be addressed on a policy level through the PSC, or as stand alone issues in rate cases.

- **Benchmarks**

  Benchmarks serve to provide quantifiable goals in water use or loss, such as a percentage reduction in use over a specified period of time or a specified reduction in water loss over a period of time.

  - Factors to consider:

    - There is benefit to setting specific standards to be met by utilities. Benchmarks can provide guidance for utilities in the highly subjective area of conservation.

    - Establishing benchmarks as compliance standards may not be appropriate for all utilities, especially those utilities experiencing excess capacity issues.

- **State Agency and Municipality Water Efficiency Planning**

  Requiring state agencies and municipal governments to develop and implement water conservation plans and goals for government buildings sets a good example. Some states take the lead by implementing government building conservation programs including percentage reductions, retrofits, and other conservation measures.

  - Factors to consider:

    - The ultimate goal of these efforts is to encourage conservation by demonstrating conservation in government.

    - The main debate with this initiative is the cost to the taxpayer for implementing these programs. Some states have instituted programs that allow state agencies to finance these measures, when they would not otherwise be funded through capital appropriations, by demonstrating that the measures would lead to energy/water savings that could pay for the cost of the measure.

[7] Water- The Wisconsin Numbers http://psc.wi.gov./utilityinfo/water/newsinfo/Benchmark.htm

- **Consolidation of Water and Wastewater**

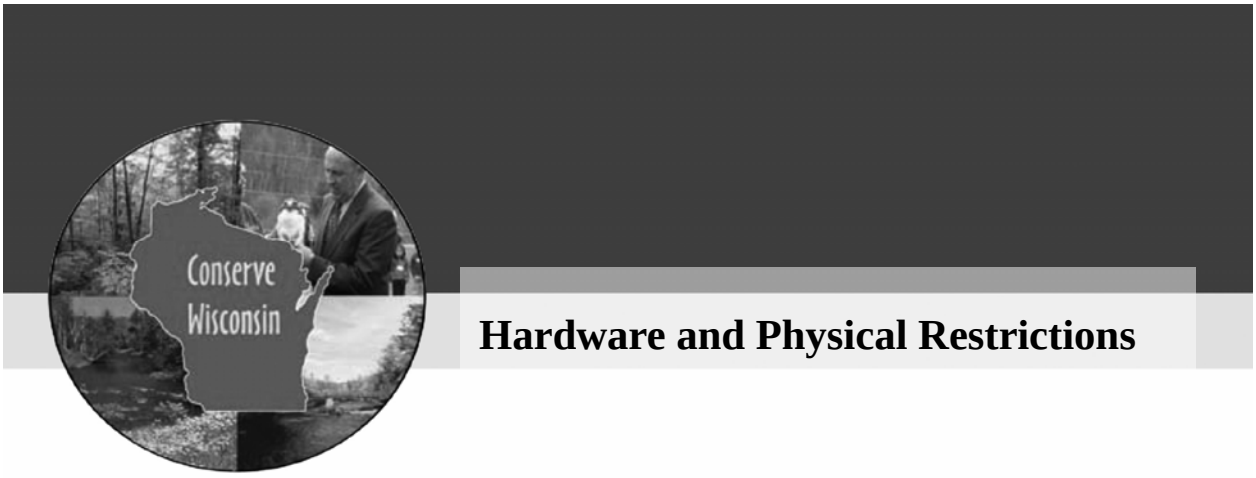
  This measure focuses on the efficiencies of consolidating the operation and management of water and wastewater utility activities.

  - Factors to consider:

    - If the water and wastewater divisions of a particular community consolidate, there may be savings in the areas of both water conservation and water and wastewater operating costs.

    - Conservation measures can be adopted that are beneficial to both water and wastewater utilities.

    - The drawbacks of consolidation include difficulties in coordinating water and wastewater activities as well as long-standing practice of keeping these functions separate.



The installation of more efficient plumbing hardware and flow restrictors are the actions most frequently taken to conserve water. These measures are more reliable than other methods because they often do not rely on the willingness of the consumer to curtail use on an ongoing basis. The following are factors to consider for each of the menu items.

- Choosing between rebate or replacement programs
- Choosing the right product-replacement vs. retrofit
- Sponsorship by a utility, local government or other entity
- Cost recovery
- Logistics of implementation
- Consumer education is essential in implementing these programs

- **Low-Flow Toilets and Urinals**

  Toilets were the first hardware components to be used to promote water conservation. Since 1992, the Environmental Protection Agency (EPA) has required that all sales of toilets meet the 1.6 gallons per flush (gpf) standard. Low-flow toilets have long been recognized as a preferred and accepted way of reducing water use.

  - Factors to consider:

    - Some wastewater utilities are concerned that low-flow toilets cannot adequately move waste in the wastewater system as needed. This concern can be addressed by utilities or other entities sponsoring low-flow toilet programs by working directly with the wastewater utilities to ensure the right fixtures are chosen and the flowage issues are addressed.

    - A potential drawback for implementation is the lack of toilet quality. In some cases, the toilets require additional flushing to remove waste causing more water usage than anticipated.

    - When a toilet replacement program is in place, the sponsoring entity must take into consideration what to do with the obsolete toilets. In California, old toilets are collected and crushed into aggregate and used in road construction.

- **Showerheads and Faucets**

  Replacing or retrofitting showerheads and faucets to use a maximum of 2.5 gallons per minute (gpm) is another significant way in which to reduce water use without relying on consumer behavior (other than in the replacement of the showerhead and or faucet).

  - Factors to consider:

    - Because the hardware for these programs is so economical, these programs can often be giveaways which promote more participation.

    - Another benefit of reducing water use through faucets and showerheads is a corresponding savings in energy to heat water as well as corresponding savings in wastewater costs.

- **Appliances - Dishwashers and Clothes Washers**

  Requiring or offering the installation of water efficient clothes washers and dishwashers is another way to reduce water use. Efforts are currently underway on water-saving appliances in some locations in the U.S. that follow the model of the Department of Energy's Energy Star ® Partnerships program in saving energy.

  - Factor to consider:

    - When considering this measure, the sponsoring entity should look at how old fixtures will be disposed of or recycled in order to reduce waste.

- **Pre-Rinse Spray Valves**

  High-efficiency pre-rinse spray valves can be targeted for food service and institutional settings where these valves are used. Inefficient pre-rinse spray valves can be replaced with those that do not exceed 1.6 gpm. Pre-rinse spray valves have been reviewed by the EPA for efficiency and while the EPA has declined to give an Energy Star® specification to these valves, the EPA continues to encourage standards for these valves. The major standards include a 1.6 gpm output and a cleanability factor of no more than 26 seconds per plate.

  - Factors to consider:

    - It is important to note that the quality varies among products and each should be reviewed for the standards listed.

    - There is a great potential for water savings in the food service industry with the use of these devices.

- **Rain Sensors and Other Auto-Irrigation Restrictions**

  Sensors may be installed that shut off an auto-irrigation system before or during a rainfall. Also, the use of auto-irrigation systems for new landscaping may be limited through local or state legislation.

  - Factors to consider:

    - Auto-irrigation restrictions have the potential of reducing much of wasted landscape watering.

    - When considering this measure, existing auto-irrigation systems should be addressed as well as any newly installed systems. This is also a place where low water use landscaping can be used in a complementary way.

    - Enforcement may be difficult for existing systems. There is also a potential problem for systems that have rain sensors if they are defective or broken. There is no logistical and cost efficient way to detect and correct those problems.

- **Sprinkling Ordinances**

  Ordinances or other community rules may be promulgated that prescribe the amount, timing, or ability of consumers to water their lawns.

  - Factors to consider:

    - Ordinances are not within the jurisdiction of utilities. If a local government entity sponsors this measure, it should do so in consultation with the utility to coordinate feasibility, peak demand issues and consumer education.

    - An ordinance limiting sprinkling can have a substantial effect on short-term peak water usage as well as provide a long-term solution to recurring water usage issues such as mid-day sprinkling and over-watering.

    - When considering this measure, the sponsoring entity and consumers should take into consideration existing landscaping as well as using a sprinkling ordinance in conjunction with a low water use landscaping program. Consumers can maintain a pleasant aesthetic by making low water use plantings and staying in compliance with the sprinkling ordinance.

    - It is important to review and determine the method and effectiveness of the enforcement of this type of measure. If enforcement can only be done effectively through the utility, then the ordinance will have to be created in close consultation with the utility.

- **Porous Pavement**

  Porous pavement is a special type of pavement that allows rain water or snowmelt to pass through, reducing the amount of wastewater introduced into storm drains. It could be required for use in particular applications like public places, residences and other commercial and publicly paved areas.

  - Factors to consider:

    - Because motorized vehicles often use paved areas, there is the danger of introducing certain soluble hazardous materials to the soil through the porous pavement.

    - Porous pavements have a much shorter life span in areas with extreme winter and summer climates. Water may freeze and destroy the viability of the pavement. The feasibility of its use in Wisconsin may be limited.

    - Unless there is a requirement to use this type of pavement in construction, there is a lack of enforcement capability with this measure. This measure is more suitable for a voluntary measure that could be accompanied by financial incentives.

    - A benefit to porous pavements is that the pavements often act as filters by removing pollutants from the water running through them.

    - Because the water running through the pavement is reintroduced into the soil and recharges to local aquifers, there is less of a need for curbing and storm sewers.

    - Porous pavements offer improved road safety because of better skid resistance.

    - This technology is relatively new. As such, there is currently a fairly high failure rate for these pavements. In addition, there are few experienced installers and technicians for this type of pavement.

- **Building Codes**

  Building codes can be written that require conservation as part of building or operational processes. Bans on single-pass cooling and mandates for efficient coin-operated washers are examples of codes requiring water efficiency.

  - Factors to consider:

    - Utilities generally do not have control over changes in state, county or municipal codes. Utilities can work with their local or state government bodies to assist the process, but cannot guarantee its outcome. Nonetheless, utilities and other water stakeholders can favorably impact a rulemaking process. This is especially true where broad consensus among diverse interests can be achieved.

- When code changes are introduced, it should be done in cooperation with the local water utility to ensure that the proposition is feasible and the water utility can accommodate the requirements.

- When a requirement for building is enacted, there may be unintended economic impacts leading potential businesses and consumers to locate elsewhere if the restrictions are too cumbersome for their particular circumstances. In addition, there may be economic impact on the local utility which may see a reduction in water use and a corresponding reduction in revenue that can jeopardize the economic viability of the utility.

Water Rates and Related Issues

Price signals and financial incentives may be effective tools to help water utilities achieve water conservation goals. Simple economics would predict that customers generally use less water when they have to pay more for it. Conservation rate structures may allow water utilities to avoid the costs of overt regulation, restrictions, and policing while retaining more freedom of choice for customers. Also, conservation rates may encourage customers to more readily purchase and use water-conserving appliances and fixtures.

The following are the different conservation rate structures and pricing philosophies that may be used individually or in combination by water utilities. Each should be considered for its economic, environmental, and social consequences.

- **Class Rates**

  Class rates are the use of a specific rate structure for each customer class. Typically, water utility customer classes are defined as residential, commercial, industrial, public authority and, if applicable, wholesale (sales for resale).

  - Factors to consider:

    - The flexibility of class rates allows water utilities to design rates for each customer class that will recover the revenues consistent with the cost of service allocations. However, the water utility's billing system will have to be able to accommodate different rate structures for different customer classes, and there may be costs associated with upgrading the current billing system or purchasing a new system.

    - Class rates will allow water utilities to tailor specific rate structures to accomplish the specific conservation goals for each customer class. For example, a water utility may choose an inclining block rate structure for the residential class to discourage excessive lawn watering, while it has a declining block rate structure for the industrial class to keep from driving wet industries away from the system. Inclining block rate structures employ increasing unit rates as consumption exceeds set volume levels. In contrast, the per unit charge in a declining block rate structure decreases as the volume ranges are exceeded. Customers receive a stronger price signal to conserve water under an inclining block rate structure.

- There may be concerns that customers in a customer class may feel singled out and discriminated against if their bills for like service are significantly different from those of other customer classes. Also, the classification of customers will be especially important with class rates. For example, the distinction between "industrial" and "commercial" may not be so readily apparent for a particular customer, but it could make a difference in the water rates that customers will pay.

- **Declining (Decreasing) Block Rates**

  The declining block rate structure recognizes that per unit costs of water production and delivery decrease as customers use more. Its goal is to recover the appropriate cost of service from each customer class through a single rate design. It uses a fixed charge per billing period plus two or more usage blocks with the price per unit decreasing in each subsequent block.

  - Factors to consider:

    - Consistency with traditional cost of service concepts is important for fair and equitable rates. The declining block rate structure, in conjunction with the American Water Works Association's Base-Extra Capacity Method of Cost of Service, has been used effectively in Wisconsin since the 1970s to help recover the appropriate cost allocations from each of the customer classes served through a single rate design. Because of this history of use, declining block rates provide stable and predictable revenues and help keep utilities financially viable.

    - Declining block rate structures are easy to implement and are fairly easily understood by customers.

    - Declining block rates discourage conservation, or at least don't promote it. Other rate structures, especially inclining block rates, send a much stronger conservation price signal to customers.

- **Flat (Uniform) Rates**

  Uniform rates charge the same unit rate for all water used within a customer class. A uniform rate includes a fixed charge per billing period and a single volume rate for all water consumption.

  - Factors to consider:

    - Simplicity is a major appeal of uniform rates. They are easy to implement and understand.

    - Uniform rates are better at promoting conservation than declining block rates.

    - A single uniform rate for all water sold for all customer classes would be inconsistent with traditional cost of service concepts. Uniform rates on a class basis, however, work quite well for achieving fair and equitable cost-based rates.

- **Inclining (Inverted) Block Rates**

  The inclining block rate structure is probably the one most identified as being a "conservation rate structure." The goal is to reduce demand for more elastic end uses by increasing per unit charges for water as the amount used increases. The inverted rate applies a fixed charge per billing period plus two or more usage blocks with the price per unit increasing in each subsequent block.

  - Factors to consider:

    - Inclining block rates are highly conservation oriented and will generally reduce both overall and peak water consumption. They send a very effective price signal to customers to encourage them to use less water.

    - Customers generally understand inclining block rates, but design and implementation may be more difficult. There may be challenges in developing the appropriate block cutoffs and unit rates. These design and implementation difficulties should subside with time and experience.

    - Without definition of customer classes, inclining block rates will penalize large customers. If these larger customers "opt out" of the system and move to private wells, the remaining customers will end up paying more for water. Revenues may also be difficult to predict and may be unstable for the utility until more experience is gained using inclining block rates. These rates may also be inconsistent with traditional cost of service concepts.

- **Seasonal Rates**

  A seasonal rate structure charges customers a higher usage rate during the peak water use season than is charged during the off-peak season. It uses a fixed charge per billing period plus a uniform usage rate that varies during different periods or seasons of the year. The goal is to reduce seasonal peak demand, typically during peak outdoor water usage, by making those who would create the increased demand pay more for it.

  - Factors to consider:

    - By matching higher usage rates with the increased costs to provide water during the peak season, seasonal rates are equitable. However, revenues may be difficult to predict because the impact on water demand is difficult to predict. The impact on high volume users may be substantial.

    - Seasonal rates will reduce seasonal peak demand. The greater the seasonal rate differential, the greater the reduction in water demand.

    - Customers generally understand seasonal rates, but implementation may be more difficult. The peak season needs to match up with the utility's billing period, and customer education and notification is a must.

- **Excess Use Rates (Surcharges)**

  Excess use rates impose a higher usage rate or surcharge on what is considered "excess" (higher than average) water use. This involves the calculation of an average base water usage volume for each customer. During the peak period or season, a surcharge is applied to users whose water demand exceeds a specified percentage of their average base water usage.

  - Factors to consider:

    - A clear conservation incentive is provided to all customers through excess use rates by setting clear water reduction targets for each individual user. However, this rate structure penalizes the prior conservation efforts of customers. They have already reduced their average water usage, so their demand targets are now lower than they otherwise would have been.

    - Excess use rates may be difficult to implement and maintain. The utility's current billing system may not be able to accommodate this individualized rate structure.

    - Revenue forecasting will be difficult until the utility gains experience with this rate structure and how it impacts individual customer usage.

- **Lifeline Rates**

  Lifeline rates determine the minimum level required for "necessary" water use and establish a reduced rate for it.

  - Factors to consider:

    - The goal of lifeline rates is to keep the price for "necessary" (nondiscretionary) water use as low as possible to ensure that low-income users are not burdened by high prices.

    - Implementation may be complicated by having to determine user thresholds that trigger customer eligibility. In addition, billing systems may have difficulty in accommodating these rates.

    - Conservation goals may not be directly served under this rate structure as qualifying customers do not receive a strong price signal based on usage.

- **Rebates, Promotions, and Other Financial Incentives**

  Water utilities may choose to offer rebates, giveaways, or other financial incentives to encourage customers to purchase and/or use water-conserving appliances, fixtures, and processes. These programs may include some of the following items for residential and commercial (non-residential) customers.

  - Residential:

    - Toilets
    - Showerheads
    - Faucet aerators
    - Clothes washers
    - Dishwashers
    - Low income assistance

  - Commercial:

    - Toilets/urinals
    - Pre-rinse spray valves
    - Laundry machines
    - Other equipment/processes

  - Factors to consider:

    - A study of inside/outside residential use is necessary to determine which programs will be most cost effective. This will vary by utility. Those systems that experience large peak variations may be better served with outdoor conservation measures such as a sprinkling ban.

    - Funding for these programs through rates would be considered by the PSC in a rate case. The utility would have the burden of showing the cost effectiveness of its proposal.

    - Higher efficiency plumbing and appliances readily serve conservation goals without causing dramatic lifestyle change.

    - Incentive and rebate programs, when added to promotions of appliance retailers, can be effective in speeding the change out of inefficient appliances.

Water Reuse and Recycling

Water reuse and recycling are conservation initiatives that provide alternatives to the use of clean water for applications that do not require drinking water quality. Using a supply that meets the minimum quality requirements for the application provides efficiency and preserves water resources. Water recycling is generally viewed as a demand side initiative whereas water reuse can be either a demand or supply side water conservation option.

- **Water Reuse**

  Water reuse is the use of wastewater or reclaimed water from one application such as municipal wastewater treatment for another application such as landscape watering. The reused water meets a beneficial need as a substitute for clean (drinking) water supply. Theoretically, wastewater or any marginal quality waters can be used for any purpose as long as adequate treatment is provided to meet the water quality requirements for the intended use. Potential applications include industrial uses, landscape watering, agricultural irrigation, aesthetic uses such as fountains, and fire protection.

  - Factors to consider:

    - Identification of reuse opportunities is critical. The initial focus should be on opportunities present in the form of larger industrial plants or green space irrigation such as a golf course. The proximity of these facilities to the reuse source of supply is also important as the cost to transport reuse water can be prohibitive.

    - The utility must determine the minimum water quality needed for the use and be able to provide reuse water sources that meet those quality requirements. For example, some tertiary treated wastewater is clean enough for incidental human contact and can be used for many applications. Often, due to the higher phosphate levels in reuse water, careful microbiological control is needed and can at times be a challenge.

    - All reuse applications must have the necessary regulatory and health agency approvals. Approvals typically require site specific information and adequate time for review must be built into the implementation timeline.

    - The delivery system is critical to the success of reuse programs. Where potable, clean water is readily available at low cost, it may not be cost-effective to install a third

main (in addition to the potable water mains and sanitary sewer mains) to convey reuse water. In contrast, in parts of Tampa Bay, Florida, the system has the reuse water main readily available in the street because need and lack of clean water supply make it cost effective. Where the economics do not support the general availability of reuse supply, it may still be advantageous to pipe the reuse water from the wastewater treatment plant to one or two nearby industrial or similar large use applications.

- The cost effectiveness of using a reuse supply as compared to clean water is a fundamental consideration. There are many variables that enter into this calculation, but the important concept is to recognize that for different systems and even for different areas within the same system, the economics of a reuse water supply may well support entirely different conclusions.

- Just as water and wastewater operations are integrally related relative to the revenue implications on one system as pricing changes are made to the other, so too is reuse water a part of this revenue family. As reuse water is available, often at lower cost than potable supply, big users transferring to reuse will have impact on the potable system revenues.

- Protecting public health requires diligence in researching, designing and instituting a reuse water application. Close consultation with the environmental, regulatory, and public health agencies/communities from concept inception to implementation is key.

- In water rich states like Wisconsin, gaining public acceptance of reuse water supply is paramount to success. Carefully planned and executed education and promotional materials delivered in an accessible, open and honest environment can instill trust and gain broad acceptance and support.

- **Water Recycling**

Water recycling is the use of water by a single user for a specific application in which the effluent from the specific use is captured and redirected back into the use scheme. In some applications, the effluent is used for a different purpose than its initial application. In this context, water recycling is predominantly practiced by industry. One of the largest applications of recycling water is for cooling industrial equipment or products. Considerable progress has been made to eliminate "once through" cooling applications. Other common recycling applications include recycling industrial rinse water use in a car wash or clothes laundry and water used to convey products such as vegetable crops within the cannery.

  - Factors to consider:

    - Identifying opportunities for recycling is the first step. The initial focus should be on opportunities present in the form of larger industrial or commercial operations. Large quantities of water are needed to cool heat-generating equipment and to condense gases in a thermodynamic cycle. Recycling of cooling water can conserve vast amounts of potable water.

- Closely related to recycling and often an integral part of a recycling initiative is the repair, adjustment or modification of equipment to put in place the most efficient system. Changing out the mechanicals to reflect state of the art efficiencies in equipment and available technology can greatly enhance a recycling project.

- Water use audits provide strategic information that the customer and the utility need in order to make good business choices. The utility benefits from knowing who is using the larger amounts of water and how it is being consumed. This helps the utility to target recycling and other conservation initiatives to customers where the largest impact can be made. By knowing and understanding their choices, customers are in the best position to make good business decisions that promote their bottom lines while helping to sustain precious water supply resources. Water use audits should be made for all new nonresidential customers and on a regular basis for existing commercial/industrial applications with greater frequency for large users.

- The cost of recycling initiatives needs to be compared to the use of larger amounts of clean (drinking) water. Circumstances where the use of a potable water supply is readily sustainable at relatively low cost will result in different conservation programming outcomes than circumstances where drinking quality supply is more scarce and/or more costly. There are many variables that enter into this calculation, but the important concept is to recognize that for different systems and even for different companies or applications within the same system, the economics of recycling may well support entirely different conclusions.

- As in water reuse, water recycling has impacts on the utility revenue stream. As recycling water means lower water sales for the utility, it will have short-term rate and revenue implications. In the long-term, the demand savings can mean the extended use of the existing water supply without need for large capital additions to provide water to meet peak demands. Peak demand shaving, as well savings in average day use, can result in significant long-term financial savings along with the preservation of the water resource.

Water Conservation and Efficiency Issues Outside the Scope of this Report

During the stakeholder meetings, numerous ideas were discussed that were outside the scope of the Governor's Conserve Wisconsin request of the PSC and the DNR, but are valuable for consideration in the context of a state water conservation and efficiency policy. We have included these ideas for consideration in follow up activities to this initial report on options for water utilities to reduce demand.

- **Revision of the State Plumbing Code**

  The state plumbing code includes standards for new construction. A review of this code to reflect changes in water efficiency technology would make new construction less water intensive. It would be important to consider the impacts of such changes broadly and make corresponding changes to all aspects of the plumbing code affected. For example, reducing the flow to a fixture may reduce the required drain pipe size and reducing water use may also affect water discharge that can affect transport of sewage. Corresponding changes may be needed in the code to ensure these issues are addressed adequately. This activity would need to be done in conjunction with the Wisconsin Department of Commerce, Safety and Buildings Division.

- **Work with Others on Synergies Related to Water and Energy Efficiency**

  The Wisconsin Focus on Energy program already provides rebates for energy efficiency. Opportunities for linking energy and water efficiency should be investigated. Concepts such as water efficient clothes washers also being energy efficient may provide ready linkages and potential rebates.

- **Consolidate Water and Wastewater Utility Operations at the Local Level and State Agency Functions**

  Water supply and wastewater treatment are integrally related. Reduction of water use can potentially have both positive impacts (such as delaying expansion of wastewater treatment plants) and negative impacts (such as reducing collector system ability to transport solids). Where it is economically and logistically feasible, consolidating the management of these functions would provide opportunity for easier decision making that could result in better environmental outcomes. Even without consolidating operations, some benefits can be realized by coordinated efforts between water and wastewater.

- **Mandatory Water Conservation Planning**

  Several stakeholders emphasized the importance of making water conservation planning mandatory, as they were concerned that voluntary planning would have minimal results. Much of the concern relates to how the information from this report will be implemented in a statewide conservation plan.

- **Opting Out of the Local Water Utility**

  Under current law, water utility customers may elect to construct their own water supply. Large customers leaving the utility system can have serious financial consequences on the remaining customers. Sometimes known as the "opt out" provision, this issue may need policy development. Also at issue is whether water efficiency and conservation requirements should be equally applied to both public and private water supplies (with particular attention to high capacity wells).

- **Water Intensive Industries**

  One of the qualities that makes Wisconsin inviting to industry is its extensive clean water resources. These resources are especially valuable to water-intensive industries. This fact came up repeatedly at the Symposium, with a focus on ensuring that industry does not face unnecessary obstacles in locating to areas of the state that are well suited to meeting their water needs.

- **Tracking Water Use by Watershed**

  This method of accountability gives planners, water utilities, and other consumers the information needed to make informed decisions about opening a new water supply, expanding current supply, and how viable and necessary conservation measures are or will likely become. Watershed-specific use tracking follows groundwater table levels, drinking water quality and the affects of water issues on vegetation and wildlife. Some of this work is already being done by the United States Geological Survey and other entities.

- **Tracking Implementation of Conservation Programs**

  Once conservation programs have been established, there must be ongoing tracking of the conservation efforts. This measure allows those just beginning the water conservation process to review and evaluate the results of those who have gone before them in those efforts. In addition, it provides base data against which Wisconsin can evaluate the overall effectiveness of water conservation.

- **Conservation Potential Assessment**

  Conservation efforts can be evaluated for their efficacy and feasibility based on software and tracking that reviews many variables within each conservation measure. While this assessment would be the ideal place to start, it has substantial startup costs and will not be valuable as a tool until the measures being assessed have had time in operation to offer workable results.

Stakeholder input has been invaluable to the success of the Governor's Water Conservation Symposium and the development of the menu of demand side initiatives for water utilities provided in this report.

The members of the Water Conservation Advisory Group represent diverse water interests in Wisconsin, including industrial water consumers, environmental groups, utilities and local government. The following are statements from some members of the Water Conservation Advisory Group members.

Jodi Habush-Sinykin
Of Counsel, Midwest Environmental Advocates

Lessons Learned:
Moving Water Conservation Forward in Wisconsin

While Wisconsin may be perceived as water rich compared to other parts of the country, vital areas of Wisconsin are, nonetheless, facing challenges to their water supplies, including drawdown of groundwater aquifers, problems with water quality, and water demands exceeding available supplies. In order to ensure that water supplies continue to meet the state's escalating water demands without harm to Wisconsinites' treasured lakes, streams and wetlands, Wisconsin must act before it is too late to conserve and protect its waters.

In consideration of the conservation components of the Annex Agreement of 2005, as well as the conservation provisions being developed for the state's Groundwater Management Areas designated under the Groundwater Quantity Act of 2004, the time is ripe for our state to build upon the Governor's Conserve Wisconsin initiative to develop an intelligent, integrated water conservation approach that recognizes the critical importance of Wisconsin's water resources to the state's economic development and sustainability.

Nevertheless, our Stakeholder Committee was asked to limit the scope of our recommendations to a menu of demand side conservation measures that Wisconsin water utilities could employ at their discretion. Comparable voluntary initiatives in Wisconsin have proven largely ineffective, however, as demonstrated by the unheeded conservation provisions found within the Great Lakes Charter legislation and the state's Wellhead Protection Program.

So as not to repeat these same mistakes, the Public Service Commission and Department of Natural Resources should build upon this watershed time in Wisconsin history by moving beyond discretionary,

demand-side-only parameters to enable the development of a state water conservation program that can achieve the following:

- **Measurable conservation objectives**. At both the state and local utility level, quantifiable conservation goals need to be set both in terms of level of participation and explicit efficiency benchmarks and thereafter monitored, evaluated and reported upon within a statewide data base.

- **Philosophy adjustment**. Rather than narrowly focusing on how we can "save" water or affect a utility's bottom line, efforts should be channeled into how we can use water in a *sustainabl*e fashion that preserves the high quality of the resource and achieves "no net loss" to meet the future needs of Wisconsin's communities, businesses and environment.

- **Realization of synergies.** An integrated water conservation vision would identify and foster existing synergies between the state's water utilities and wastewater and energy providers.

- **"Opt out" prohibition for large scale users.** Without a statewide prohibition preventing large-scale water users from opting out of available municipal water systems, realistically speaking, local utilities will be deterred from initiating conservation pricing or other system-wide conservation initiatives for fear of the fiscal consequences and potential "death spiral" attendant to the loss of large users.

- **Selection of conservation measures and technologies**. Because a utility's selection of best management practices and conservation strategies will form the backbone of any successful conservation plan, state utilities and policymakers will need to determine which practices are most advantageous and cost-effective in light of historic and projected water supplies and demands. A timely resource in this respect is *Protecting Wisconsin's Waters: A Conservation Report and Handbook*, which identifies numerous models of conservation initiatives and practices from around the country and organizes them for ease of reference into a number of appendixes, available at http://www.midwestadvocates.org/media/publications/Protecting%20Wisconsin%27s%20Waters%20Report%20MEA.pdf

Thomas J. Bunker
General Manager, Racine Water Utility
Wisconsin Water Association

Communities' Water Conservation Needs and Drivers Vary

I would first like to thank the Wisconsin Department of Natural Resources (DNR) and Public Service Commission (PSC) for allowing me to be part of the Wisconsin Stakeholders Group on Water Conservation. Governor Doyle's Symposium on Water Conservation on May 23, 2006, in Sheboygan brought a lot of useful information to the forefront on the conservation topic.

I am the General Manager for the Racine Water and Wastewater Utilities, but I represented the Wisconsin Water Association. This is the local section of the American Water Works Association (AWWA). Its members consist of water professionals including suppliers, operators, engineers, plant managers and many others.

The foremost concern of this group and myself is that there be a tool box of water conservation techniques. The point being every utility is not the same. Each has different water drivers that may work better with varied water conservation techniques. For example, surface water plants along Lake Michigan who are operating below capacity are working now on water loss issues in the distribution system because of old failing pipe. This has been a concern of the PSC and these specific utilities. Other communities that may be on groundwater wells and are running short of water because of a dropping groundwater table may want to use less water using different water conservation techniques such as alternate side sprinkling, increasing block rate structures and other ideas. Other communities that are using all their supply may want to postpone large capital investments by conserving water.

The bottom line is that each community has different needs and drivers when it comes to water conservation. Each community is in competition for jobs with many communities out west and down south. Water is one of the best assets Wisconsin has. Each community has, can, and will use water conservation techniques if it is justifiable as a driver to keep rates competitive, protect their water source, and meet the increasing rules and regulations demanded by government and the public.

Dale R. Olen
Sierra Club

Water Utilities as Guardians of a Sustainable Treasure

The water utilities play a central role in the health and well being of Wisconsin's communities by providing clean and plentiful water to all its inhabitants. Historically, the quality and quantity of water delivered by the utilities has been very good. But now, through Governor Doyle's *Conserve Wisconsin* initiative, the utilities are being asked to do even more in terms of providing clean water. They are being asked to *conserve* water as well. This Stakeholders' Committee is attempting to provide a menu of best practices and technologies to help utilities supply and conserve clean water.

I would like to suggest a preamble and some additional elements to the menu:

1. That the water utilities in the State of Wisconsin slightly reframe their essential mission and role to include the notion of being, not only the dispensers of clean and healthy water, but also the **guardians and accountants** of that water.

2. That the driver compelling ever more serious efforts at conservation and protection of our water by the utilities involve adding the goal ***of achieving water sustainability (more water returning to the aquifers than leaving them or at least maintaining a relatively equal amount of water leaving as returning)***.

3. That in order to achieve water sustainability and high efficiency of distribution, all water utilities start by systematically identifying where water is being lost in their systems (through leaks and inefficient customer use). Based on such analyses, the utilities could then develop plans to eliminate that waste as quickly as possible by repairing pipes and infrastructure.

4. That as the utilities work to eliminate leaks and repair wasteful structures, they also create a consulting function that would work with their large, wasteful and

inefficient customers in becoming more conservative in their water use. This is where many of the "menu options" in the toolbox would be useful. In effect, the utilities would educate and consult with industry, commerce and institutions, presenting them with effective conservation practices and technologies.

Regarding "water utilities as guardian/accountants of a sustainable treasure," an analogy might help. When wealthy people die, they leave wills granting treasures to their children and friends. In those wills they often appoint a guardian to oversee these trusts, making sure that the treasure is not lost, diminished or squandered. That responsible guardian/accountant then works with the inheritors of the treasure, making sure they live off the interest only in order to maintain their wealth.

In Wisconsin, we have inherited the treasure of fresh water, given to us by every generation of Wisconsinites stretching back to the glaciers that originally flooded our state. Today we are rich in fresh water, possessing more, by some estimates, than any other state in the country. At times, we citizens have been good stewards of our treasure and at other times we have acted like spoiled rich kids squandering our inheritance. But the State has given us, through the water utilities, a public servant to be the guardian and accountant of our wealth. This responsible guardian does not simply let the citizens use their wealth willy-nilly, but makes sure the water-rich sons and daughters of Wisconsin are sustaining their water supply; are not using more than can be returned to the aquifers (water's bank); and making sure the water is not being wasted through leaks and extravagant use.

There are two keys to an effective "menu of conservation choices" approach:

1. The menu needs some enforcement provision. Despite the best intentions of the water utilities, the evidence from the panel of experts at the Water Conference stated that conservation programs do not work when they only seek voluntary compliance. According to Amy Vickers, these programs function more effectively when there is a regulatory and enforcement dimension in the plan. Although I am aware that the water utilities most likely do not desire any more regulations and mandates, the reality seems to be that they are necessary if the conservation effort is to work.

2. The identity, role and function of the water utilities should be tweaked and reframed: away from "Utility as *Distributor* of all the clean water that can be dispensed" and toward "Utility as *Guardian* and *Accountant* of our State treasure and resource." The water utilities' role in the *Conserve Wisconsin* Program would then be to make certain that water becomes and remains a sustainable resource; that communities are reducing the amount of water delivered in their systems; and that the water waste and loss in those systems is systematically being eliminated.

Daniel S. Duchniak, P.E.
General Manager, Waukesha Water Utility

Water Conservation Initiatives Must be Flexible and Promote Economic Growth

The State of Wisconsin has many unique and positive attributes that attract residents and businesses to locate here. Water is one of those. Wisconsin has an abundance of water, although it may not necessarily be in the locations where it is needed the most.

As leaders, we must take responsibility to protect the natural resources that make our State great, but we must do this in a way that does not place us at a disadvantage when competing with other states for business. Therefore, when it comes to protecting our water supplies, we must offer the flexibility to communities to deal with localized issues in a manner that does not impede strong economic growth for the state.

The demand side presentations provided many variations to accomplish the end goal of water conservation. Many of the examples looked at updating water fixtures, implementing ordinances, enacting zoning restrictions, modifying water rates, increasing public education, and other various options. While all of them are worthy of consideration by all water utilities in the state, it will be more effective to provide the water utilities with a "toolbox" of options. The state should also provide a rating system that provides rankings of utilities based on water conservation initiatives implemented, as well as the water source and type of system that they operate (e.g., a once-through system, closed system, etc). For example, initiatives enacted by a utility with a closed system would be worth more points than a utility with a once-through system. Rankings could ultimately lead to recognition by the Governor's office for meeting high standards in water conservation.

Wisconsin has the potential to be a leader in water conservation, being proactive instead of reactive to the problem. One size does not fit all in terms of water conservation, and systems will vary dependent on water source. In implementing demand side initiatives, consideration needs to be given to the source of water and to protection of the resource throughout the entire water cycle. While demand side initiatives are a good place to start in protecting our resources, there are many other areas to consider in protecting and replenishing it, as well.

CONCLUSION

A Key Step in Sustainable Water Use

This menu of demand side initiatives for water utilities to reduce water use is a critical tool to inform the development of a comprehensive state water conservation and efficiency program for Wisconsin.

Several key points raised by the speakers and stakeholders stand out. It is clear that Wisconsin utilities already employ several important water conservation and efficiency tools, including metered water use and the PSC's water loss prevention program. As further steps are explored, the water supply differences between various communities and the local utilities needs to be accommodated; any statewide program should ensure local flexibility for implementing a conservation and efficiency program. As the state and local communities continue to support these efforts, critical areas of focus should be education, water use accountability, the purchase of water-saving hardware, use of water conservation rates where appropriate, and the exploration of water reuse and recycling.

This report identifies several key water conservation and efficiency issues outside the scope of the menu. The advisory group recommended that other policy efforts like those conducted by the Groundwater Advisory Committee and the Legislative Council Study Committee on Great Lakes Annex Implementing Agreements look closely at these issues, especially the option currently open to customers to leave or "opt out" of a water utility and install their own wells.

The advisory group also recommended that the PSC and DNR take specific steps to continue the momentum of water conservation activities identified at the Water Conservation Symposium and in this report. They recommended that the agencies take advantage of this opportunity to disseminate information about the menu of water conservation activities described in this report, to collect baseline data on water use and water conservation efforts and to further develop a statewide water conservation education program. Specific recommendations include:

- **<u>Getting the Word Out</u>:**

  The PSC and DNR should proactively look for opportunities to provide presentations on this report and the water conservation menu to interested groups around the state including environmental groups, local governments, industry and policymakers.

  The PSC and DNR should prioritize the menu of water conservation initiatives in this report, pinpointing the efforts that are the most cost effective and have the most impact on water use.

- **<u>Benchmarking Water Use Data</u>:**

  The PSC and DNR should gather data and develop a baseline for water usage in the state in order to accurately measure the impact of future water conservation efforts. Pumping data should be collected by watershed for both utilities and private high capacity wells. In addition, the agencies should map aquifers experiencing depletion and water quality problems. All the data should be presented in a way that is easy to access and understand. Staff and financial resources necessary for these activities should be provided for as part of the legislation needed for the state water conservation plan and adoption of the Great Lakes Annex Implementing Agreements.

  The PSC should survey water utilities across the state to determine the types of water conservation efforts already underway, the outcomes of those efforts and the barriers the water utilities see to implementing other water conservation efforts.

- **<u>Developing an Education Program</u>:**

  The PSC and DNR should work together to develop a proposal to implement a statewide water conservation education program. The agencies should look at what would be needed to conduct an information and education campaign that would affect water usage. The agencies should base the proposal on available research for changing behavior with values-based messages and they should explore the best way to reach specific target audiences.

Finally, this report is the product of current and potential efforts in Wisconsin that address the need for water conservation and efficiency. In addition to this work, parallel and related initiatives are under way as follows:

- The Groundwater Advisory Committee will address water conservation strategies for Groundwater Management Areas,
- The Council of Great Lakes Governors is currently drafting regional goals for water conservation and efficiency,
- Wisconsin, with the Council of Great Lakes Governors, will draft a plan for statewide implementation of the Great Lakes regional conservation and efficiency goals, and
- A Legislative Council study on the Great Lakes Charter Annex Implementing Legislation will address water conservation.

All of these efforts will form the basis of a comprehensive statewide water conservation and efficiency policy. The successful completion of these efforts will ensure the continued sustainability of the state's most precious resource.

APPENDIX A

ADVISORY GROUP

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http://psc.wi.gov/conservationWater/index-waterConservation.htm