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Water Conservation and Efficiency Program Review
Illinois' Sixth Report to the Compact Council and Regional Body

November 25, 2015

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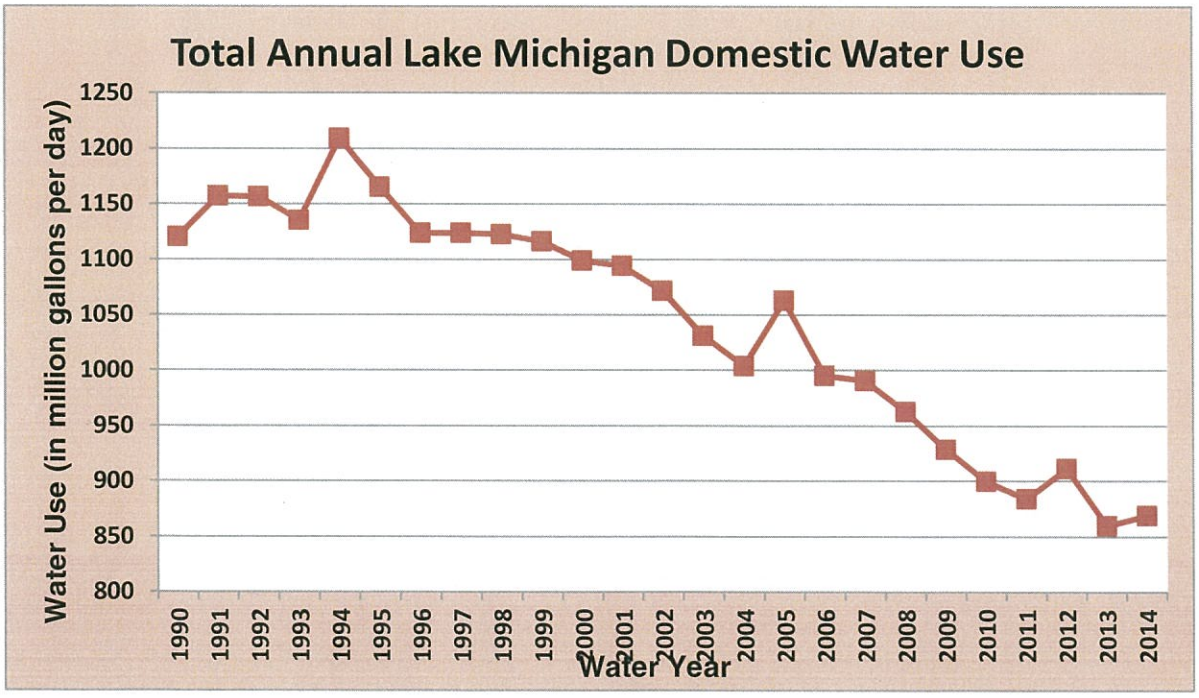
Illinois' water conservation and efficiency program

A. Status of Illinois' Domestic Water Use from Lake Michigan



In Water Year 2014 total domestic Lake Michigan water use was 872 million gallons per day

(mgd), very close to Water Year 2013's pumpage. Overall, this table shows the long term decline in total domestic use of Lake Michigan water. The drought years of 1994, 2005 and 2012 are clearly visible, but the overall downward trend in water use that has occurred over the last 20 years is significant, about a 300 mgd reduction since the early 1990's. In 2014 the annual precipitation was 40.5 inches, almost 4 inches above the 23 year average of 36.7 inches.

Water use summaries for the 2010 through 2014 Water Years are on our website: http://www.dnr.illinois.gov/WaterResources/Pages/LakeMichiganWaterAllocation.aspx. This information was obtained from the Annual Water Use Audit Reports (LMO-2). The Department's monthly pumpage reports (LMO-3), submitted by direct diverters, are used for reporting to the Great Lakes Regional Water Use Database.

B. Program Legal Basis

The U.S. Supreme Court Decree [Wisconsin v. Illinois, 449 U.S. 48 (1980)] that limits Illinois' diversion of Lake Michigan water also contains language directing Illinois to implement a water conservation program. The Level of Lake Michigan Act [615 ILCS 50] incorporates the Decree language which states that:

> "...all feasible means reasonably available to the State and its municipalities, political subdivisions, agencies and instrumentalities shall be employed to conserve and manage the water resources of the region and the use of water therein in accordance with the best modern scientific knowledge and engineering practice." [615 ILCS 50/5)]

This is the operative judicial and statutory language that directs the Illinois Department of Natural Resources (Department) to develop and implement a water management and conservation program covering all permittees of Lake Michigan water.

C. Program Objectives

In 2010, the Department developed and posted on our website Illinois' Lake Michigan Water Conservation Goals and Objectives, as required by the Compact and the Regional Agreement. http://www.dnr.illinois.gov/WaterResources/Pages/LakeMichiganWaterAllocation.aspx
The Department's water conservation and efficiency program objectives are:

- Enforce the adoption of standards that require the efficient use and conservation of Lake Michigan water by the end user (homeowner, business/industry).
- Establish standards for good water system management and leakage control by the owner/operator of a water supply system.
- Ensure that Lake Michigan water diverted directly into the Chicago Waterway system for various purposes is kept to a minimum.
- Collect water use data annually; monitor changes in water use patterns. Encourage public water supply systems to evaluate the effectiveness of their conservation efforts.
- Prepare and maintain long-term water demand forecasts.
- Promote the adoption of water rate structures that encourage conservation and water efficiency.
- Encourage water suppliers to invest in water infrastructure and the use of innovative technology to improve water systems management.

- Encourage research, development and implementation of water efficient technologies. Develop linkages with organizations such as USEPA's WaterSense Program, the Alliance for Water Efficiency and others, to keep abreast of the latest conservation technologies.
- Inform, educate and increase awareness regarding water use, conservation and efficiency via newsletters and other such means of communication.
- Work with our Lake Michigan water allocation permittees and our Great Lakes basin partners to enhance information sharing.

D. Program Activity – Updating Administrative Rules

The Department has revised its Rules and Regulations for the Allocation of Water from Lake Michigan (IL Admin. Code, Title 17, Part 3730). The revised rules were adopted in November 2014. The updated Lake Michigan water allocation rules will improve Illinois' water conservation and efficiency program. Here is a very brief summary of the substantive changes to the rules.

- Since 1977 the Department has had an 'Unaccounted-For-Flow' standard for all domestic Lake Michigan water supplies. This standard has now been replaced with a 'Non-Revenue Water' standard, which will allow public water supplies to utilize the water audit methodology recommended by the American Water Works Association (AWWA water loss audit methodology), and to better track the value of water loss.
- Water systems not in compliance with the non-revenue standard will be required to prepare and submit a water system improvement plan.
- Local/Municipal plumbing codes/ordinances are being updated to require that new and replacement plumbing fixtures be a labeled WaterSense product.
- The classification system has been revised so that a Lake Michigan water allocation applicant that utilizes deep aquifer groundwater is a higher priority use than the use of water from Lake Michigan to meet navigation requirements and minimum discretionary dilution flows necessary to maintain the CAWS in a reasonably satisfactory sanitary condition.
- Additional guidelines for lawn sprinkling have also been included, as well as recommendations for sub-metering in new multi-family building construction where practicable and feasible and setting water rates to reflect full cost pricing.

Guidance for Preparing Water System Improvement Plans

The focus of this rule change is to be a catalyst to assist communities in addressing water loss problems, utilizing the best methods of water accounting and loss reduction. A water system improvement plan will be a locally developed plan of action that identifies the causes of water loss, what measures need to be implemented to reduce water loss and an estimated timeframe to implement those measures.

Over the past year the Illinois Environmental Protection Agency contracted with the Illinois Section of the American Water Works Association and the Illinois Rural Water Association to hold 35 water loss audit training sessions throughout the state, including at least 12 within the Lake Michigan water service area. The Department encouraged all Lake Michigan water supplies to take advantage of this free class, which provided an excellent introduction to the American Water Work's Water Loss Audit Software. Use of this software is now required for all Lake Michigan Water Allocation permittees.

E. Program Activity – Lake Michigan Water Allocation Newsletter

The Department did not prepare a newsletter during the last year as our efforts were concentrated on working with our permittees on implementing the changes to our rules and completing the 2015 water rate survey. The last newsletter was distributed in September 2014, and is still available on the Lake Michigan Water Allocation homepage: http://www.dnr.illinois.gov/WaterResources/Pages/LakeMichiganWaterAllocation.aspx

F. Program Activity – Develop Linkages with other Conservation Organizations

During this past year the Department's has continued partnerships with other groups/organizations to further our water conservation program efforts. These include:

- Maintaining our membership in USEPA's 'WaterSense Partner' program and updating our rules to require the use of 'Water Sense' labeled plumbing fixtures as our standard for water efficient plumbing fixtures.
- Working with regional organizations such as the Chicago Metropolitan Agency for Planning, the Northwest Water Planning Alliance, the Northeastern Illinois Regional Water Supply Planning Group, the Center for Neighborhood Technology, and the Metropolitan Planning Council to further our outreach to communities in the areas of water supply planning, drought management, water loss control and sustainable water resource management.
- Working with the Illinois Environmental Protection Agency (IEPA) to better integrate our water conservation program with their administration of the Clean Water Initiative Fund, a $1 billion low interest loan fund that significantly expands Illinois' State Revolving Fund. These funds are available to help Illinois communities improve their water and wastewater infrastructure, and will be particularly useful for Lake Michigan communities that need to upgrade their water infrastructure in response to our new non-revenue water thresholds.
- Promoted the Illinois Section AWWA's, and IEPA's, and the Illinois Rural Water Association's water loss control workshops throughout the state.
- Participated in the Annual Illinois Section AWWA's Regulatory Conference to present the Department's Lake Michigan water allocation program.

G. Program Activity – Water Rate Survey

The Department recommends that Lake Michigan water providers adopt water rate structures that 1) are based on metered water use, 2) discourage excessive water use, and 3) reflect the full cost of water. Including the long term cost to properly maintain and operate the water supply distribution system in such a manner as to keep system losses to a minimum.

Our long term practice has been to undertake a water rate survey of all Lake Michigan water providers every 5 years. During the past year we completed a 2015 Lake Michigan Water Rate Survey, which can be found at: http://www.dnr.illinois.gov/WaterResources/Pages/LakeMichiganWaterAllocation.aspx.

The average residential water rate for 2015 was $7.97 per 1,000 gallons; an increase of 53% over 2010's average residential rate of $5.22 per 1,000 gallons! This is a substantial increase in our region's cost of water, and we believe it reflects a renewed interest in setting water rates that will enable water utilities to address infrastructure repair and replacement needs.

H. Program Activity – Water Use and Water Loss Monitoring

Water loss information was again collected in 2014, the last year that permittees reported utilizing unaccounted-for-flow (UFF). In 2014, the average UFF in the Lake Michigan water service region was about 5.5%, a slight increase over that reported in 2012.

Concerned with the number of communities that continued to struggle with high rates of water loss, in 2013 the Department entered into a Memorandum of Agreement with the Chicago Metropolitan Agency for Planning to utilize their Local Technical Assistance program to conduct an analysis of the obstacles and constraints faced by public water supplies in managing/minimizing water loss. The Center for Neighborhood Technology also collaborated on this project. Their analysis and recommendations were presented to the Department in a July 2014 report titled "An Assessment of Water Loss Among Lake Michigan Permittees in Illinois", and can be accessed at: http://www.cmap.illinois.gov/programs-and-resources/lta/idnr. Their analysis confirmed that water loss is becoming more pervasive throughout the Lake Michigan water service area, and that the allowance for maximum unavoidable leakage was masking the severity of actual water loss. They also found that 74% of our permittees have no formal water loss control policy.

The report supports the changes to the water allocation rules that switch to a non-revenue water threshold/water audit accounting system utilizing the AWWA methodology. This water audit methodology will provide better feedback to our water utilities on the value of lost water, and supports our goal to encourage our permittees to operate, maintain and upgrade water system infrastructure to promote the efficient use and conservation of Lake Michigan water.

The 2013 and 2014 Annual Water Use Report forms were modified to allow our domestic permittees to estimate and report the value of their non-revenue water, and the 2015 Annual Water Use Report forms, which were recently sent out, will require our permittees to complete the AWWA water audit worksheet. This worksheet specifies non-revenue water as both a percentage of total use as well as the value of non-revenue water. While it will take some time for our permittees to get used to this new audit methodology, it will provide them with better information on how their water system is performing.

I. Program Activity – Control of Direct Diversion into Chicago Waterway System

The total amount of Lake Michigan water diverted into the Chicago Waterway System for discretionary diversion and navigation makeup flow was 310.04 cubic feet per second (cfs) in water year 2014. At the end of the 2014 water year, the five year running average of these two components of direct diversion stands at 296.72 cfs or 8.28 cfs below the combined allocation (305 cfs) for these two components of direct diversion. The Metropolitan Water Reclamation District of Greater Chicago holds the Lake Michigan water allocation for both discretionary diversion and navigation makeup.

The other primary use of Lake Michigan water diverted directly into the Chicago Waterway System is to operate the navigation locks at the mouth of the Chicago River and on the Calumet River. Both of these lock facilities are operated and maintained by the U.S. Army Corps of Engineers. Illinois does not have any control over the amount of water diverted for lockage or for leakage through these structures, although this water is included in the accounting for Illinois' diversion under the U.S. Supreme Court Decree. Lake Michigan water levels have a significant impact on the amount of water diverted for the operation of the navigation locks.

J. Project Activity – Status of Water Demand Forecasts and Water Use

In 2008, the Department completed a comprehensive water reallocation for all our water supply permittees. As part of this reallocation, water demand forecasts for each year out to 2030 were developed and ultimately included in the Department's updated Lake Michigan water reallocations. A primary reason for this long timeframe is to ensure that the Department's water allocation program is sustainable over the foreseeable future, and will continue to keep Illinois' total diversion below the authorized U.S. Supreme Court Decree limit of 3200 cfs. It is anticipated that sometime during the next 5 years the Department will undertake another comprehensive water reallocation and extend allocations out to at least the year 2040.

During this past year the Department did not issue any new water allocations. Currently, several petitions for modifications of existing allocations are pending.

K. Project Activity - Water Infrastructure

During this past year the City of Chicago continued to pursue a number of initiatives to upgrade their water, wastewater and stormwater infrastructure. In 2014 the City of Chicago reported the installation of over 15,500 new water meters, the termination of 1,540 unused water services and the replacement of 85 miles of old water main.

A number of other Lake Michigan communities have also developed, or are working on conservation/sustainability initiatives. The northeastern Illinois region has a number of organizations who work with local government to help them become more sustainable. These initiatives are also moving outside the Lake Michigan water service region.

Conclusion

Illinois has had a Lake Michigan water conservation and efficiency program for over 30 years. Our program is consistent with and fully supports the Great Lakes-St. Lawrence River Basin Water Conservation and Efficiency Objectives. The unique nature of Illinois' Lake Michigan water use and diversion as allowed under a U.S. Supreme Court Decree has resulted in a water conservation and efficiency program that is implemented primarily as a regulatory program, with additional measures, such as conservation pricing, conservation education and information sharing, implemented through a non-regulatory effort.