Innovation in Water Conservation Best Practices

Narrative Report

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Executive Summary

Michigan's water sectors were required under Public Act 35 of 2006 of the Natural Resource and Environmental Protection Act (NREPA) to design guidelines for generally accepted water management practices or environmentally sound and economically feasible water conservation measures within 12 months after the effective date of the Act. In 2008, Michigan's water sectors including public water supply, agriculture irrigation and non-irrigation sector, and the business and industry (B & I) sectors adopted generally accepted water management practices or environmentally sound and economically feasible water conservation measures.

Since their adoption in 2008, there have been significant advancements in water efficiency, and some sectors have established processes to periodically review and update their practices and reflect advancements and innovations in science, research, and technology. This project builds upon these historical and more recent policy foundations. To support long-term sustainability of Michigan's water resources, this report documents review processes for how the state's water use sectors have engaged with and updated the 2008 generally accepted water conservation BMPs. With a particular focus on the B & I sectors, it identifies innovations and technological advancements in water conservation best practices that can benefit Michigan's B & I water use sectors, contributing toward Michigan's goals under the MI Healthy Climate Plan.

Results and engagement from this project will inform the State of Michigan Water Use Program and Michigan's Water Conservation and Efficiency Program, and advance progress toward achieving Michigan's water conservation and efficiency goals and objectives established under the Great Lakes Compact and Agreement. This report

includes a higher-level overview of the research approach and key themes that emerged from the project. For more detailed summary of information, findings, and outcomes, see the accompanying analytical report.

Introduction

Michigan has a long history of working in tandem with neighboring Great Lakes states and Canadian provinces to protect shared water resources. This commitment was formalized in 2005 through the Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement. This was followed by the St. Lawrence River Basin Water Resources Compact, which, taking effect in 2008, created the Great Lakes – St. Lawrence River Basin Water Resources Council and committed each member of the council to establish a regional framework for protecting, conserving, and managing the waters of the Great Lakes and St. Lawrence River Basin, requiring each party to develop water conservation and efficiency programs aligned with shared objectives.

In 2006, the state of Michigan enacted Public Act 35 of 2006 of the Natural Resource and Environmental Protection Act (NREPA), which required the state's major water use sectors to design and update guidelines for generally accepted water management practices or environmentally sound and economically feasible water conservation measures. This legislation directed Michigan's major water use sectors to establish and periodically update guidelines for environmentally sound and economically feasible water management practices. In response, Michigan's public water supply, agricultural (irrigation and non-irrigation), and business and industry (B & I) sectors adopted a set of voluntary best management practices (BMPs) in 2008, forming a foundational approach to advancing water efficiency across the state.

Since their adoption in 2008, there have been significant advancements in water efficiency, and some sectors have established processes to periodically review and update their practices and reflect advancements and innovations in science, research, and technology. However, because of the voluntary nature of the 2008 BMPs, some sectors – including B & I – may be advancing their practices, but do not have an established process to review and update conservation measures to reflect advancements achieved since the practices were developed. To support long-term sustainability of Michigan's water resources, this report documents review processes for how the state's water use sectors have engaged with and updated the 2008 generally accepted water conservation BMPs, with a particular focus on the B & I water use sectors.

As stewards of significant water use and innovation, B & I sectors have an important role to play in advancing conservation and efficiency—and in realizing the associated economic, environmental, and operational benefits across Michigan and the Great Lakes Region. AWE's study, "Assessing the Economic and Environmental Benefits of Industrial Water Use Efficiency in the Great Lakes," showed economic and process benefits to the participating industries in addition to environmental benefits to the watershed, and in many instances, long-term benefits to water and wastewater utilities as well (Alliance for Water Efficiency, 2012). The importance of B & I water efficiency is reflected in the Michigan Water Strategy, which says "Michigan is recognized as a place to invest and locate a business due to its support of sustainable water technologies, water conservation, and high quality of life." It also states that "Michigan has a strategic focus on water technology and innovation to grow sustainable water-based economies," and "uses water more thoughtfully and efficiently to grow sustainable economies."

This report highlights water conservation best practices that can benefit Michigan's water sectors, contribute toward Michigan's goals under the MI Healthy Climate Plan[1], and support long-term sustainability of Michigan's water resources, highlighted in the Michigan Water Strategy[2]. The MI Healthy Climate Plan, a comprehensive plan meant to protect public health and the environment while helping to develop new clean energy jobs by making Michigan fully carbon-neutral by 2050, provides an opportunity to make greater advancements in water conservation and efficiency through the intersection of water, climate, and energy. The Michigan Water Strategy is comprised of nine goals to support sustainable use of Michigan's water resources in tandem with economic development. In the interest of supporting the MI Healthy Climate Plan and Michigan Water Strategy, this report characterizes current engagement with the 2008 water efficiency and conservation BMPs and highlights innovative practices and trends.

Approach & Methodology

This project employed mixed-methods qualitative approach, emphasizing the collection of information and insights through first-hand accounts and perspectives from industry stakeholders. Methods included desktop research, surveys, email and phone communication, individual interviews, and stakeholder group meetings. Methods were exploratory in nature and were not intended as prescriptive evaluations or formal assessments of the 2008 voluntary BMPs.

[1] https://www.michigan.gov/egle/about/organization/climate-and-energy/mi-healthy-climate-plan
[2] https://www.michigan.gov/egle/about/organization/office-of-the-great-lakes/strategy

The core project tasks included:

1. Develop and implement an engagement and dissemination strategy to involve Michigan water sectors in the project to maximize the benefits of the project results and findings.
2. Summarize existing Michigan water sectors' processes to review and/or change water conservation best management practices (BMPs).
3. Research innovation and technological advancements in water sector water conservation BMPs and their impacts within the business and industry sectors in other Great Lakes states and provinces and other innovative jurisdictions.
4. Summarize findings that will advance Michigan water sectors' water conservation BMPs within the business and industry sectors to help contribute to Michigan's water conservation and efficiency program goals as well as practices that may also contribute toward achieving Michigan's climate and carbon neutrality goals.
5. Share project results and findings to inform and advance innovation in their sector's water conservation and efficiency practices and contribute toward achieving Michigan's climate and carbon neutrality goals.

The sections below outline the research and stakeholder engagement methodology in detail.

Desktop Research & Review

Desktop research was used throughout the project to:

- Identify relevant water use sector stakeholders;
- Gather and review relevant industry research, literature, and reporting materials to inform project findings;
- Collect and review documentation on existing industry BMPs;
- Identify and document innovative water efficiency and conservation practices throughout Michigan and the Great Lakes region.

Stakeholder Identification

The project team initially compiled a list of potential stakeholders and representatives from all water use sectors. The stakeholder list was utilized to support outreach for project tasks and as a living tool for the project team to track the status of outreach, meeting details, and stakeholder notes. The list was continuously updated as new contacts were identified throughout the project. The scope of engagement was targeted at the State of Michigan's water use sectors engaged in the development of the 2008 voluntary BMPs for both the non-B & I and B & I water use sectors. The project team engaged both non-B & I

and B & I stakeholders; however, greater emphasis and more robust engagement efforts were directed toward the B & I sector, as it was the primary focus of the project.

Non-Business & Industry Stakeholders

Water use sectors engaged in the non-B & I water use sector categories included:

- Agricultural Irrigation
- Non-Agricultural Irrigation
- Public Water Supply

Engagement with non-B & I water use sectors and subsequent documentation of engagement outcomes was led primarily by the Midwest Energy Efficiency Alliance.

Business & Industry Stakeholders

Water use sectors engaged in the B & I water use sector categories included:

- Aggregate Industry
- Beverage Industry
- Chemical Manufacturing Sector
- Electric Utilities
- Pharmaceutical Manufacturing & Research
- Pulp & Paper Industry
- Wet Process Cement Manufacturing

Engagement with B & I water use sectors and subsequent documentation of engagement outcomes was led primarily by Alliance for Water Efficiency, with support from the Midwest Energy Efficiency Alliance.

Engagement Strategy

The project team developed and implemented an engagement and documentation strategy to gather information on the advancement of water conservation and efficiency BMPs across Michigan's B & I water use sectors.

The engagement plan included the implementation of the following tasks:

1. Development of a stakeholder list including organizations and representatives across Michigan's business and industry water use sectors
2. Email and phone outreach to identified stakeholders to inform them about the project and invite them to participate
3. Presentation to Michigan Chamber of Commerce Energy & Environment Committee and participation in Chamber podcast to inform members about the project

4. Launch an online survey to assess baseline awareness of 2008 BMPs and recruit participation in stakeholder engagement opportunities
5. Virtual interviews with identified stakeholders to gather information on current review processes for updating the 2008 BMPs and to identify innovative strategies
6. Regular convening of a working group comprised of B & I water use sector stakeholders to promote industry learning on water efficiency and conservation, document industry engagement with the 2008 BMPs, and identify innovations, opportunities, and challenges to advancing water efficiency and conservation
7. Distribution of a "BMPs Exercise Worksheet" for B & I working group members to review the original 2008 BMPs and identify which strategies are being implemented, updated, or improved upon within their respective industries.

Stakeholder Interviews

The project team conducted interviews with stakeholders from each water sector – including representatives from government agencies, public institutions, non-profits and private sector organizations. Interviewees provided thorough accounts of processes for updating and communicating water efficiency BMPs, as well as supporting documentation and additional sector contacts. These accounts allowed the project team to identify multiple programs and processes to update BMPs within water use sectors. Interviewees also shared information on water efficiency progress to date, barriers experienced by policymakers and implementers alike and recommendations for future programs and policies. A total of 22 stakeholders were interviewed, including 10 from the non-B & I sectors and 12 from the B & I sectors.

Participants and Recruitment

The project team conducted initial outreach to contacts through email invitations which outlined the project objectives and the corresponding interview process. The project team developed a 1-page document summarizing the overall project scope, objectives and timeline, and included this document with any stakeholder outreach.

Interview Design

As the purpose of this interview process was to collect descriptive information on the history, progress and challenges to updating BMPs for each sector, the project team chose to utilize a semi-structured interview format. The project team developed a set of twelve research questions to guide conversations. While these questions laid the framework for interview structure, interviews were open ended and guided by interviewees interests, experiences, and expertise. Interviews were remote and lasted approximately 30 minutes to 1 hour.

Interview Analysis

Interviews were not recorded, but detailed notes were taken from each meeting. Notes were reviewed by the project team and qualitatively analyzed for common themes. The project team then organized qualitative information to compare information across interviews and determine common trends and themes.

Michigan Chamber of Commerce

The project team coordinated with EGLE and the MI Chamber of Commerce to implement a range of education, outreach, and project recruitment strategies:

- Ron Burke (AWE), Emily Finnell (EGLE), and Mike Alaimo (Chamber) were guest speakers on the MI Chamber's "MI Business Matters" podcast in an episode titled "Water Usage and Efficiency." The podcast included a discussion on water use and management best practices in Michigan and provided a background on the research project, including highlighting the opportunity to join the B & I working group.
- AWE presented at the Chamber's Environment & Energy (E&E) committee on August 1, 2024. The presentation provided background on the 2008 BMPs, a summary of the purpose and goals for the project, and the opportunity to join the working group or participate in an interview with the project team. One week after the presentation, E&E Committee members were sent a copy of the presentation slides and a link to complete a survey to indicate interest in participating.
- A project one-page summary, an industry survey, and presentation resources were sent to the Chamber's general weekly newsletter on August 14, 2024.

B & I Outreach Survey

An online survey was launched to recruit B & I stakeholders to participate in the B & I Water Conservation Working Group, gauge interest in the project, and establish a baseline on industry understanding and familiarity with the 2008 BMPs. The survey was distributed via several industry channels, including the Michigan Chamber of Commerce, EGLE's Water Use Advisory Council, AWE's communication channels, and via direct email outreach. The survey was available from August – October 2024 online via JotForm.

B & I Water Conservation Working Group

The B & I Water Conservation Working Group was comprised of industry representatives across Michigan's B & I water use sectors. The purpose of the working group was to:

- Share how the B & I sector has engaged with the voluntary 2008 BMPs
- Identify innovations and advancements in water efficiency BMPs since 2008
- Learn what other industries and states are doing to advance water conservation and efficiency
- Identify opportunities for Michigan's B & I water use sectors to continue advancing and implementing BMPs

The working group convened virtually five times from October 2024 – March 2025. Working group meetings employed a mixture of guest presentations, group discussions, live polling, and offline exercise activities.

Engagement Outcomes

Takeaways

Stakeholder engagement showed that water conservation and efficiency are often pursued as secondary benefits of other priorities such as energy efficiency, cost savings, or wastewater management, and are most often tied to corporate sustainability goals rather than addressed independently. While many organizations reported implementing some water-saving strategies, awareness and direct use of the 2008 BMPs was limited, with most indicating only moderate to low levels of adoption. This suggests an opportunity to raise awareness of the BMPs as a tool and educational resource to build on existing practices already underway.

Engaged stakeholders also indicated that water conservation and efficiency are not always immediate priorities, given the range of environmental and operational priorities they must balance and manage. Challenges relating to water quality, wastewater management, stormwater, energy efficiency, among other regulatory requirements, may leave limited capacity to voluntarily adopt additional measures. A perception of abundant and inexpensive water was also noted as a barrier to garner public and organizational support to advance water conservation and efficiency, especially in settings where the costs of process changes often outweigh the savings on water bills.

Challenges

The engagement plan strategies outlined above entailed an iterative, trial-and-error approach to identify effective engagement methods. One-on-one interviews emerged as the most effective strategy for gathering in-depth perspectives, particularly in building trust and facilitating open dialogue. In contrast, broader outreach efforts, such as email campaigns and informational webinars, were less successful in creating sustained

engagement. Engaging business and industry stakeholders around the voluntary BMPs presented several challenges over the course of the project. Despite outreach efforts through multiple channels, overall participation was limited.

A key challenge throughout the process was maintaining consistent participation, especially over an extended time period. While general stakeholders—such as representatives from associations, advocacy groups, or government entities—were more readily accessible and responsive, it was more difficult to engage specific companies or facilities within each water use sector. These organizations often required multiple points of contact and follow-up, and many declined or did not respond despite repeated outreach efforts. In some cases, stakeholders expressed a degree of caution around sharing internal practices. This dynamic may have contributed to the overall difficulty in establishing open, two-way dialogue, and in gathering comprehensive feedback from participants.

Additionally, organizational turnover may have played a role in the observed disconnect. Because the BMPs documents were developed in 2008, current staff may not have been involved during earlier phases of rollout or adoption. Consequentially, while conservation practices detailed in the 2008 BMP documents may be implemented or adopted, the original documents are not being utilized as a guiding tool. Identifying and supporting new champions within companies— those who are positioned to lead internal water efficiency efforts— will be important for re-establishing awareness of the 2008 BMP documents as valuable guidance tools and educational resources to continue increasing water conservation in Michigan.

These engagement outcomes underscore the importance of building trust to support shared learning, and that there is no one-size-fits-all model for stakeholder engagement. Successful strategies required flexibility, time investment, and sensitivity to the varying capacities and motivations of different water use sector stakeholders.

Opportunities

Many stakeholders engaged in this project have adopted corporate sustainability and Environment, Social, and Governance goals, which frequently serve as a primary driver for implementing water-saving strategies. These commitments often come with reporting requirements and dedicated staff, creating natural entry points for aligning water conservation with organizational priorities. Involvement in sustainability networks also offers opportunities for peer learning and knowledge sharing, while tailored outreach—such as sector-specific case studies and technical support—can help organizations at different starting points advance water efficiency.

Building on these commitments, existing industry groups, organizations, and networks provide valuable platforms for future collaboration and engagement. Organizations such as the Council of the Great Lakes Region, The Water Council, the Alliance for Water Stewardship, the Fresh Coast Climate Solutions, and the Federal Energy Management Program (FEMP) already have existing programs and established relationships with diverse stakeholders to promote water stewardship practices. Creating partnerships with these groups and leveraging their existing channels can reduce barriers to participation, support knowledge exchange, and accelerate progress in advancing water efficiency across the business and industry sectors.

Results & Findings

Summary of BMPs

The original 2008 BMP documents were developed to address practices across communication, industrial process, domestic water use, and landscape spheres. These voluntary BMPs were designed as a tool for companies across the B & I sector to advance water efficiency and conservation practices. A General Model BMP document titled *2008 Water Withdrawal and Conservation Practices* was developed to provide water efficiency and conservation BMPs that apply to multiple sectors in the B & I sphere. In addition to the general guidelines, eight industries that accounted for over 80% of water withdrawals in the state of Michigan created industry-specific water conservation plans.

These B & I sectors are the aggregate industry, beverage industry, wet process chemical manufacturing, chemical manufacturing sector, electric utilities, pharmaceutical manufacturing and research, and pulp and paper industry. The BMPs listed in the industry-specific water conservation plans overlap with the general model BMPs and are tailored to water efficiency and conservation practices specific to that industry. These documents have been available since 2008 for leaders and practitioners in the B & I sector to utilize when designing, evaluating, and improving processes that involve water within a facility or on-site.

Implementation Progress of 2008 BMPs

Table 1 presents a summary of Michigan water sectors' processes to review and/or change water conservation BMPs adopted and approved under Public Act 35 of 2006 of NREPA.

Table 1. Summary of Michigan Water Use Sector's Water Conservation BMP Update Processes

Water Use Sector	Process to Update?	Notes
Public Water Supply	No	No formal process to update the 2008 BMPs was identified. However, public water practitioners tend to take guidance from the American Water Works Association (AWWA) and wider industry best management practices to foster water savings.
Agricultural Irrigation	Yes	Strategies are reviewed and updated by stakeholders and industry experts annually as a part of the Generally Accepted Agricultural Management Practices (GAAMPs) review process.
Non-Agricultural Irrigation	No	The Non-Agricultural Irrigation sector has not conducted a BMP review or update for the sector. Individual industries, such as Golf Course Management, have published updated BMPs.
Business & Industry	No	The Business and Industry sector has not conducted a review or update of the general BMPs, and the B & I subsectors have not conducted a review or update of sector-specific BMPs.

The original water efficiency and conservation 2008 BMPs remain a strong foundation. Their core strategies continue to reflect sound water stewardship principles and align with environmental, operational, and sustainability goals. As technologies, water use patterns, and business practices evolve, there is potential to build on these practices to ensure continued relevance and impact.

Engagement throughout the project revealed that awareness and use of the 2008 BMPs among business and industry stakeholders is generally low. Even though the water conservation practices referenced in these documents are employed across the B & I sector, the original BMP documents are not used to guide conservation activities. Where water-saving efforts are occurring, they are typically driven by broader sustainability goals—such as energy efficiency, cost reduction, or regulatory compliance—rather than direct reference to the BMP guidance. Building trust, clarifying intent, and providing sector-relevant tools may be important for increasing voluntary engagement. This also presents an opportunity to increase awareness of the existing documents as guidance tools and educational resources to augment work that may already be underway.

Participants highlighted a variety of factors that influence whether and how water conservation is pursued. Common drivers include corporate sustainability commitments, cost savings, energy-water synergies, and customer or reputational expectations. Barriers often stem from low water costs, limited staff capacity, competing priorities, or a lack of technical resources.

Innovation in Water Conservation BMPs

The 2008 BMPs are a strong foundation for water efficiency and conservation practices within the B & I sector. Innovation and trends in the water efficiency and conservation space for general model and industry-specific BMPs build upon the recommendations in the 2008 BMP documents. Advanced technology and innovative design allow for the opportunity to improve upon these fundamental principles and present the opportunity to save both water and energy. While many innovations result in a combined reduction in water and energy consumption, some water saving mechanisms enhance energy. There is a need and responsibility for B & I leaders to build resilient systems that consider environmental tradeoffs and will thrive in future climate conditions.

A list of the innovations and trends that build upon the general model 2008 BMP shows the range of possibilities to advance water efficiency and conservation in the B & I sphere. The 2008 BMPS are stated in *quotes and italics,* and corresponding innovations and trends apply widely across the B & I sector. There are opportunities to advance beyond the 2008 BMPs. These advancements are stated in *italics*. Additional details and industry-specific BMPs can be found in the accompanying analytical report.

Employee Training and Education

- Build upon the 2008 BMP *"Incorporate water conservation policies and procedures into employee training programs"* by sharing water conservation knowledge with employees to increase awareness.
- Build upon the 2008 BMP *"Participate in water conservation advisory groups or similar organizations"* by participating in industry groups and water conservation advisory groups.

Employ Water-free alternatives

- Build upon the 2008 BMP "*Consider replacing water-cooled equipment with air-cooled equipment"* by investing in air-cooling technologies to replace water cooling equipment.

- Advance beyond the 2008 BMPs by *replacing water-based processes with water-free processes* with ionized air cleaning for packages, dry lubricants for conveyor belts.

Conduct routine and thorough maintenance of equipment

- Build upon the 2008 BMP *"Incorporate water conservation into ISO or other existing QA/QC processes"* investing in flow meters and water quality sensors for routine hands-off monitoring within a facility.

Monitor and evaluate water use and efficiency

- Build upon the 2008 BMP *"Maintain general water use inventory for the facility and update periodically"* by submetering within a facility to track water flow and quality with flow meters, conductivity meters, and pH meters.

Incorporate water efficiency decisions in strategic planning

- Build upon the 2008 BMP *"Consider the impact of future facility modifications or production changes on water usage. Changes to routine operations provide a good opportunity to evaluate current practices for possible water conservation opportunities"* by working with the local municipality to understand water resource availability and take advantage of public water and climate data to integrate infrastructure development with data supported decisions.

Invest in water reuse and recycling

- Build upon the 2008 BMP *"Improve rinse cycles by using cascading or counter-current rinsing from processes that require highly pure water to rinse parts from other processes that do not require such high-quality water"* by reusing water in clean-in-place (CIP) systems and for cleaning packaging.
- Advance beyond the 2008 BMPs by i*nvesting in water cleaning technology to advance water reuse and recycling opportunities within a facility* with zero liquid discharge and nanofiltration technologies.

Capitalize on alternative water sources

- Advance beyond the 2008 BMPs by u*tilizing alternative water sources for facility activities when environmentally sounds and economically feasible* with on-site alternative water use from water used in cooling processes, industrial procedures, and rainwater capture.

Improve water efficiency of cooling systems

- Build upon the 2008 BMP *"Investigate potential chemical treatments to reduce the amount of make-up water required for cooling towers, steam boilers etc."* by taking action to preventing scaling, minimize corrosion, reduce foreign material fouling, control biological growth, choosing appropriate infrastructure materials, monitoring and controlling water flow and quality, acid treatment, ion exchange/water softening, membrane-driven filtration, electro-chemical water treatment, and seeking alternative water sources for cooling tower makeup water.
- Build upon the 2008 BMP *"Consider retrofit applications that use once-through cooling water (chillers, compressors, condensers etc.) which close-loop recirculation systems, while keeping in mind that a decrease in water withdrawal for once-through cooling may increase overall process water consumption"* by investing in dry and hybrid cooling towers, water-side and air-side economizers. Optimizing chiller efficiency and reducing the demand on chiller systems is also a BMP.

Improve water efficiency of heating systems

- Build upon the 2008 BMP *"Investigate potential chemical treatments to reduce the amount of make-up water required for cooling towers, steam boilers etc."* by employing the same monitoring and treatment techniques listed as cooling tower BMPs, capturing and reusing water condensate, investing in expansion tanks to temper hot wastewater.
- Advance beyond the 2008 BMPs by *installing heat recovery infrastructure to capture and reuse heat within the facility when environmentally sound and economically feasible* utilizing heat pumps and managing facility temperature and humidity.

Improve facility efficiency of domestic water use operations

- Build upon the 2008 BMP *"Install flow restrictors, aerators, spring-loaded valves and timers on faucets and nozzles"* by replacing nozzles with high pressure, low volume spray nozzles, ensuring the equipment is appropriately sized for the process, and investing in mechanical seal pumps.
- Build upon the 2008 BMP *"Shut off faucets and nozzles when not in use"* by investing in smart faucets, smart nozzles, and efficient equipment such as high pressure waters, industrial scrubbers, steam cleanings, and spray-and-vacuum machines.
- Advance beyond the 2008 BMPs by *improving facility efficiency and reduce energy requirements to minimize water consumption for environment control* by managing

indoor temperature and humidity, relying on ambient temperatures, or investing in geothermal infrastructure.

Improve efficiency of domestic water use operations

- Build upon the 2008 BMPs *"Replace continuous- or timed-flush urinals in restrooms with low-flow manual flush or sensor-controlled equipment. This can be as simple as retrofitting the flush valve with a new spring and diaphragm"* **and**, *"Replace older toilets that use as much as 22 litres per flush with ultra-low-flush toilets (6 litres per flush) or dual-flush (6 litres for solid waste, 3 litres for liquid waste)"* and, *"In new installations consider waterless urinals, which do not consume any water (eliminating water supply lines and flush valves), are easy to install and meet public health standards"* by investing in efficient domestic products. EnergyStar and WaterSense provide certification for products, and a list of certified water efficient products can be found on the WaterSense website.
- Advance beyond the 2008 BMPs by *installing water efficient shower heads* and *installing water efficient faucets* by investing in efficient WaterSense certified or other efficient products.

Landscaping

- Build upon the 2008 BMPs of *"Install soil-moisture sensors and controllers", "Install drip irrigation to reduce water use in landscape areas",* **and** "*Use more drought-tolerant native vegetation",* and *"Install trigger-heads or nozzles on hoses and devices used for cleaning and watering"* by conducting routine maintenance on irrigation systems to check for leaks and watering in the early morning or evening. Additionally, large turf grass landscapes can be transformed into landscapes that consist of hardscapes and/or native vegetation to reduce watering needs.

Benchmarking

- Advance beyond the 2008 BMPs by *conducting internal and external benchmarking to evaluate water use efficiency within a facility and across the business*. Benchmarking, which is the process of comparing business and industry operations to peer facility, businesses, or standards, can improve water efficiency and facilitate cost savings.

State and Industry Trends

Key water-intensive industries sectors are growing across the United States and within the state of Michigan. These industries sectors include data centers and snow making. While

these sectors grow in the state of Michigan, the number of wet cement manufacturing plants are shrinking. Water efficiency and conservation BMPs should continue to focus on existing and advancing industries.

- Data centers can be very water intensive if they contain water-cooled, rather than air-cooled, systems. Opportunities to improve water efficiency and conservation in data center operations include investing in efficient information technology to reduce cooling needs and taking advantage of Michigan's seasonal climate to support cooling.
- Snow making is an essential component of the Michigan ski industry. The importance of this practice is growing as the climate changes. Snowmaking machine efficiency can be increased through infrastructure adjustments and routine equipment maintenance. These preventative measures will reduce leaks, support water efficiency, and enhance conservation measures.

Project Takeaways

Key takeaways emerged as outcomes and observations from this project and research:

- 2008 BMPs are a strong foundation and collection of strategies.
- While use and reference of the 2008 BMP documents in the B & I sector is low, there is opportunity to increase their awareness as guidance tools, educational resources, and opportunities for leaders to align with EGLE's water conservation goals.
- Advancement, innovation and integration in water use and efficiency varies across B&I sectors.
- Corporate Environment, Social and Governance commitments and reducing operation costs drive companies to engage with water conversation BMPs.
- However, low costs of water, the perception of water abundance in Michigan, and competing priorities are barriers to BMP engagement.
- Historical engagement and institutional memory plays a key role in determining water conservation BMP implementation.

Opportunities

Several key themes emerged as potential opportunities for future exploration:

- **Education and Outreach**: Sharing sector-specific resources, case studies, and guidance through trusted networks may help raise awareness and make water efficiency efforts more accessible.
- **Voluntary Engagement Models**: Technical assistance, peer learning, trainings, and public recognition can help normalize and support voluntary action.

- **Incentives and Value**: Framing water conservation as a business opportunity—and supporting it with financial incentives or recognition—can help make the case for investment and participation.
- **Cross-Sector Integration**: Aligning water efficiency with energy and wastewater initiatives may amplify impact and reduce siloed efforts.
- **Benchmarking and Data**: Improved access to data and benchmarking tools can support internal goal setting, transparency, and sector-wide progress.
- **Emerging Sectors**: Strategic engagement with growing industries offers the chance to integrate water stewardship into the early stages of economic development.

Conclusions

This project set out to explore the current state of water efficiency practices in Michigan's business and industry sectors and identify opportunities for innovation, collaboration, and continued learning. The findings reflect both progress and gaps—and offer a range of real-world examples that may inform future planning and program development.

Research and engagement outcomes demonstrate that building upon the foundational BMPs is the avenue to successful water conservation practices in Michigan. Opportunities to encourage voluntary engagement in water conservation BMPs across Michigan commercial business and industry include enhancing education, reenvisioning engagement models, providing new incentives, streamlining benchmarking, supporting emerging industry sectors, among others.

As Michigan works toward its water conservation and climate goals, the ideas and insights captured in this project may serve as a starting point for future partnerships, pilot initiatives, and deeper engagement with the businesses and communities that manage water every day.