



*Water Conservation Plan*

*[Entity], a Member of the  
Pharmaceutical Manufacturing & Research  
Sector*

*Michigan Chamber of Commerce*

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*Submitted by Barr Engineering Company*



# Water Conservation Plan

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# 1.0 Introduction

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Public Act 35 of 2006 (PA 35 of 06) requires that each water use sector develop voluntary guidelines for generally accepted water management practices or environmentally sound and economically feasible water conservation measures. The Act allows for such guidelines to be developed and adopted by an established statewide professional or trade association representing that sector.

In response to PA 35 of 06, the Michigan Chamber of Commerce (Chamber) has developed this template for a Water Conservation Plan (Plan) to serve as a guide for the electric generation/industrial and commercial sectors.

The Chamber, and its constituents, recognize that the development of the voluntary guidelines as set forth in PA 35 of 06, also meet the requirements of the Great Lakes Charter Annex Compact, and is consistent with the recommendations of the Groundwater Advisory Council. Specifically, Article 203 of the Proposed Compact - The Decision-Making Standard for Management of Withdrawals and Consumptive Uses within the Great Lakes - St. Lawrence River Basin Sustainable Water Resources Agreement, states:

*“The withdrawal or consumptive use shall be implemented so as to incorporate environmentally sound and economically feasible water conservation measures.”*

The Groundwater Conservation Advisory Council’s February 6, 2006 Final Report to the Legislature provided several recommendations. Within them, Recommendation # 10 states:

*“Each water-use sector should develop its own sector-specific water management practice. These should be reviewed and evaluated by a closely related professional or trade association. Water users within each sector should be encouraged to adopt and implement the water-management practices specific to their sector.”*

The guidelines developed in this Plan exemplify environmentally sound and economically feasible water conservation measures through best management practices (GAMPs).

## 2.0 Plan Objectives

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The [Entity] has developed the following objectives to help define the strategy for implementing voluntary water conservation GAMPs and improving water efficiency as part of this Plan. The objectives for this Plan include the following:

- Establish an understanding of current water use (e.g. system-wide water use audit) to establish an understanding of how water is utilized at the facility.
- Improve, modify, or audit processes to increase efficient water use (e.g. optimize efficiency of cooling systems) to encourage improvement of processes that inefficiently consume water.
- Develop, implement, and document GAMPs for water conservation at the facility to reduce water consumption from the levels that would exist without conservation efforts.
- Incorporate water conservation practices and awareness into employee training programs.
- Review and modify Plan on a periodic basis.
- Provide documentation related to implementation of the Plan (e.g. self certification with oversight provided through the Chamber).

## **3.0 Characterization of Current Water Usage**

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An important component of a water conservation Plan is the characterization of a facility's current water usage. This includes characterizing how water flows through a facility or system, identifying what purpose the water plays within the system, identifying specific equipment that consumes and uses large quantities of water, and finally, identifying how water is discharged from the system.

### **3.1 Current Water Usage**

The following elements provide a guideline for performing a water usage characterization as part of a water conservation Plan:

- Describe the source of water and how it flows to and through the facility systems.
- Identify significant water use processes, operations and equipment and account for significant sources and losses throughout the process (e.g. water audit).
- Describe water metering and water use tracking.
- Describe leak detection and repair program, if any.
- Identify current reclamation and reuse of water throughout the process, including how much water is consumed in the production process and not available for reuse.
- Identify how water is discharged from the process.

#### **3.1.1 Description of Water Use**

Facilities should:

- Meter all water coming onto site and maintain a documented water balance.
- Undertake annual water usage surveys in order to effectively identify and prioritize new water conservation measures.
- Develop and implement water conservation targets and action plans annually.

#### **3.1.2 Development of a Water Balance**

Facilities should develop, maintain and document a water balance, which includes all major sources and uses of water at the facility. Facilities should meter all water coming into the facility. This includes:

- Water purchased from off-site sources (e.g. public or private water suppliers).
- Water extracted from wells.
- Water withdrawn from surface sources by the facility.

Exceptions may be made for small sources (i.e., sources that represent less than 5% of the total facility water usage).

The facility's component water uses should be quantified using measurements or engineering estimates. Facilities should identify component water uses appropriate for their specific circumstances. Examples of component water uses are:

- cooling
- sanitary
- process (possibly several components for separate production departments)
- product use
- utilities
- cleaning
- irrigation

The sum of the component water uses should be reasonably close to the total quantity of water used at the facility.

### **3.1.3 Water Metering and Tracking**

Facilities should measure water use or install additional water meters to improve the quality of their water balance if the sum of the component water uses is not reasonably close to the total water use. The water balance should be updated annually if there is a significant change in water usage.

### **3.1.4 Leak Detection and Repair Programs**

Each facility should have ongoing leak detection and repair programs. In addition, water conservation audits should be carried out on a five-year basis. Major buildings should be audited on a yearly basis for water use.

### **3.1.5 Reclamation and Reuse**

Where possible and economically feasible, opportunities for water reclamation and reuse should be utilized at each facility.

### **3.1.6 Means of Discharging Water**

As part of the water balance, each facility should monitor all means of water discharge.

## 4.0 Implementation of GAMPs for Water Conservation

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Implementation of GAMPs for increasing water conservation and improving water efficiency are an important component of this water conservation Plan. (Entity) utilizes the following GAMPs at their facility located in \_\_\_\_\_, Michigan.

(Check those that apply)

- Install water meters in high use areas to encourage conservation and accountability.
- Install cooling towers to reduce once-through cooling water use, where appropriate.
- Retrofit applications that use once-through cooling water (chillers, compressors, condensers, etc.) with closed-loop recirculation systems.
- Replace water-cooled equipment with air cooled equipment.
- Replace liquid ring vacuum pumps with mechanical seal vacuum pumps.
- Use clean in place technologies.
- Operate pumps at minimum process rates to reduce excessive pumping.
- Calibrate and clean process equipment to optimize thermal and hydraulic performance efficiency.
- Consider the installation of surge tanks to prevent overflow or the installation of float-controlled valves on makeup water lines.
- Turn off equipment that is not in use and during shutdowns.
- Install flow restrictors, aerators, spring-loaded valves and timers on faucets and nozzles.
- Use fogging nozzles or mist eliminators to minimize water losses in cooling towers.
- Investigate alternative water sources for major processes, including using clarified, cooling or waste water for certain processes.
- Investigate process and equipment upgrades that result in more efficient operations and water use (e.g., adjusting water intake design and pump speed, optimization of the whitewater system in the mill).
- Consider opportunities for water reclamation and reuse throughout the process and facility.
- Install high-pressure, low-volume shower heads and low-flow or waterless toilets.
- Consider chemical treatments to reduce the amount of make-up water required for cooling towers, steam boilers, etc.
- Consider landscape alterations that demand less watering and prevent less runoff.
- Monitor drought and water stress conditions regionally and communicate awareness issues throughout the organization.
- Install drip irrigation to reduce watering use.

- Include water conservation policies and procedures into employee training programs.
- Participate in water conservation advisory group or organization to raise awareness.
- Incorporate water conservation practices into employee training programs.
- Implement leak detection and repair program to mitigate water losses.

These are examples of GAMPs that might be considered by a specific business at a specific location and should not be considered either a mandatory or complete listing. No one set of GAMPs would be appropriate for, or applicable to, all members of the Pharmaceutical Manufacturing and Research Sector. Each business will need to review what GAMPs are applicable in its specific circumstance.

## 5.0 Evaluation and Modification of the Plan

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Upon implementation of this Water Conservation Plan, the *[Entity]* will evaluate and update the Plan on a periodic basis. Modifications to the Plan will be based on an evaluation of the water conservation GAMPs previously implemented and upon any new relevant information. This section is intended to satisfy the requirements under the Great Lake Compact for new or increased water withdrawals by demonstrating progress towards achieving improvements in water conservation. Any water conservations measures for existing water uses is considered entirely voluntary.

The *[Entity]* will consider documenting the following information to evaluate the existing Plan:

- A list of dates and descriptions of conservation measures implemented

*[Entity adds description here]*

- Approximate amounts of water saved for each measure implemented

*[Entity adds description here]*

- Discussion about whether or not the goals of the plan have been met

*[Entity adds description here]*

- If objectives were not met, an explanation as to the reason why the objectives were not met and a discussion of the specific revisions to the Plan intended to help meet the objectives in the future.

*[Entity adds description here]*