

# WISCONSIN DEPARTMENT OF NATURAL RESOURCES WATER MANAGEMENT AND CONSERVATION AND EFFICIENCY PROGRAM REVIEW

December 11, 2024

## **General Information**

### **1. Lead agency/agencies and contact person(s) and contact information.**

Lead agency: State of Wisconsin Department of Natural Resources (WDNR)

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### **2. Identify all laws, statutes, rules, regulations, executive orders, administrative orders or other similarly enforceable documents (collectively, “Laws”) that establish or implement programs meeting the requirements of the following provisions of the Compact or Agreement. In particular, ensure that all such citations address the following sections and articles of the Compact and Agreement. Include a brief lay person description for each section of the program and weblink for more information (registration, reporting, diversion, decision making standard for water use permits, water conservation program, science and research, etc.)**

The Wisconsin Legislature ratified the *Great Lakes–St. Lawrence River Basin Water Resources Compact* (Compact) in 2007 Wisconsin Act 227. Section 281.346 of the Wisconsin Statutes details Wisconsin’s program for managing and regulating new or increased water withdrawals, diversions and consumptive uses consistent with the provisions of the Compact. There have been some changes to Wisconsin’s laws related to Compact implementation since 2007 Act 227. All relevant changes are noted below. Additional detail is provided in the table below.

COMPACT	AGREEMENT	IMPLEMENTING LAWS AND ADMINISTRATIVE CODES*
Compact Section 3.4	Agreement Article 300	§281.343(3)(d); §281.346(11)
Compact Section 4.1	Agreement Article 301	§281.343(4); §281.346(3); §281.346(11); NR 856
Compact Sections 4.2(2), 4.2(4), and	Agreement Article 304	§281.343(4b)(b), (d) & (e); §281.346(8) and (11)(d); NR 852

Compact Section 4.3	Agreement Article 200	§281.343(4d); §281.346; NR 850; NR 852; NR 856; NR 860
Compact Sections 4.8, 4.9, and 4.13	Agreement Articles 200, 201 and 208	§281.343(4m), (4n) and (4v); §281.346(4), (5m), (6) and (7); NR 851; NR 852; NR 854; NR 856
Compact Section 4.10	Agreement Article 206	§281.343(4p); §281.346 (4m), (4s), (5), (5e) and (5m); NR 860
Compact Section 4.11	Agreement Article 207	§281.343(4r); §281.346(6); NR 860

\*NR references refer to chapters or sections of the Wisconsin Administrative Code; § references refer to sections of the Wisconsin Statutes.

Registration: Water withdrawers must register a water withdrawal if the water supply system (e.g. high capacity well or surface water intake pipe) has the capacity to withdraw at least 100,000 gallons per day (70 gallons per minute) (including from the Great Lakes basin) in any 30-day period. The two exemptions to this requirement are: withdrawals to supply vehicles for the needs of the persons or animals being transported or for ballast or other needs related to the operation of the vehicles and temporary withdrawals for fire-fighting, humanitarian or emergency response purposes. Ch. NR 856, Wis. Adm. Code; <https://dnr.wi.gov/topic/WaterUse/registration.html>

Reporting: Registered withdrawers are required to measure or estimate the volume of water they withdraw every month and report that information annually to the WDNR. Even if water is not withdrawn during the previous year, a withdrawal report is still required. Reporting is required for: all high capacity well properties (statewide); permitted (Chapter 30, Wis. Stats.) surface water withdrawals (statewide); properties with a Water Use Permit (Great Lakes basin); and any properties that withdrew an average of 100,000 gallons per day or more in any 30-day period. Ch. NR 856, Wis. Adm. Code; <https://dnr.wi.gov/topic/WaterUse/report.html>

Water Use Permits: Since December 8, 2011, WDNR requires water use permits in the [Great Lakes Basin](#) (Lake Superior or Lake Michigan) for properties that plan to withdraw water at an average of 100,000 gallons per day or more in any 30-day period. There are two types of water use permits:

- **Water Use General Permit** - Required for withdrawals that average 100,000 gallons per day or more in any 30-day period but do not equal at least 1,000,000 gallons per day for 30 consecutive days.
- **Water Use Individual Permit** - Required for withdrawals that equal at least 1,000,000 gallons per day for 30 consecutive days.

Applicants must receive a water use permit prior to withdrawing water. There are no Water Use Permit application fees. § 281.346(4m), (4s), (5), Wis. Stat.; Ch. NR 860, Wis. Adm. Code; <https://dnr.wi.gov/topic/WaterUse/permits.html>

Water Conservation and Efficiency: Wisconsin implements a water conservation and efficiency program in line with the Wisconsin and Great Lakes basin-wide water conservation and efficiency goals and objectives. The water conservation and efficiency program is implemented by the WDNR, in cooperation with the Public Service Commission of Wisconsin, and the Wisconsin Department of Safety and Professional Services. Wisconsin provides [annual reports](#) on its water conservation and efficiency program to the Compact Council and Regional Body. § 281.346(8), Wis. Stat.; Ch. NR 852, Wis. Adm. Code; <https://dnr.wi.gov/topic/WaterUse/conservation.html>

Diversions: The Great Lakes Compact and Agreement ban diversions of Great Lakes water with limited exceptions. These exceptions allow a “straddling community” or “community in a straddling county” to apply to divert water (i.e., to move water out of the Great Lakes basin). “Straddling community” refers to communities that straddle the Great Lakes basin boundary. These are communities that lie partly within the Great Lakes basin and partly outside of the Great Lakes basin. Examples of straddling communities in Wisconsin are the City of New Berlin, Village of Mount Pleasant, and the Village of Somers. “Community in a straddling county” refers to communities that are wholly outside of the Great Lakes basin but located in a county that straddles the Great Lakes basin boundary. An example of this type of community is the City of Waukesha. § 281.346(4), Wis. Stat.; Ch. NR 851, Wis. Adm. Code; <https://dnr.wi.gov/topic/WaterUse/compact.html>

Other: Wisconsin summarizes water use reporting data annually and [reports](#) are available on the WDNR’s website. Additionally, Wisconsin annually provides aggregate water use data to the Great Lakes Commission to include in the Great Lakes Commission’s Great Lakes [water use report](#). Wisconsin also provides an on-line search tool of [water withdrawal sources](#).

**3. Identify any changes from the 2019 report, highlighting in particular major changes from 2019 throughout the response. If there are no changes, please indicate accordingly.**

Wisconsin promulgated two rules related to implementing the Great Lakes Compact. These rules include Ch. NR 851, Wis. Adm. Code, Management of Great Lakes Diversions and Ch. NR 854, Wis. Adm. Code, Water Supply Service Area Plans, which went into effect July 1, 2024. The Management of Great Lakes Diversions administrative code defines the application requirements and the DNR’s review processes for Great Lakes diversions. The Water Supply Service Area Plans administrative code contains the water supply service area plan requirements and procedures for public water supply systems to follow when preparing water supply service area plans. These plans are required for most diversion applications. No other statutory or administrative code changes have occurred since 2019.

The high capacity well application review process has changed since 2019. These applications relate to implementation of the Compact as they are the review mechanism for impacts from high-capacity wells on waters of the state, including waters in the Great Lakes Basin. In July 2021, the Wisconsin Supreme Court issued a decision in *Clean Wisconsin v. Wisconsin Department of Natural Resources*, 2021 WI 72, affirming the WDNR’s constitutional duty and statutory authority to consider environmental effects on the waters of the state when reviewing high capacity well applications. This decision affirmed the court’s

previous ruling in *Lake Beulah Management District v. Wisconsin Department of Natural Resources*, 2011 WI 54. In accordance with the *Clean Wisconsin* decision, the WDNR high capacity well application review process considers environmental impacts to the waters of the state when reviewing a proposed high capacity well application, makes a fact-specific determination for each application, and considers sufficient concrete, scientific evidence of potential harm to waters of the state.

## **Water Management Program Report**

- 1. Summary description of the State’s or Province’s Water management program scope and thresholds, including the current status of program implementation and a description of which New or Increased Withdrawals, Consumptive Uses and Diversions are subject to the program. The summary should include information on registration (if applicable), management and regulation, and reporting elements of the program.**

Water Use Program Management: The Water Use Program at WDNR was created to implement the Compact and *Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement* (Agreement) and to focus on sustainable and efficient water use. Wisconsin’s Compact-implementing legislation (2007 Wisconsin Act 227) and related regulatory and case law provide the foundation for the Water Use Program. While most of the program applies statewide, there are specific requirements for water users in the Great Lakes Basin. Information related to the Water Use Program is available on the WDNR website: <http://dnr.wi.gov/topic/wateruse/>.

The Water Use Program is focused on achieving Wisconsin’s goal, as described in [the state’s water conservation and efficiency goals and objections](#), to:

*“Sustainably manage the quantity and quality of water in the state to ensure that water is available to be used to protect and improve our health, economy and environment now and into the future.”*

Water Use Program components include:

- Documenting and monitoring water use through registration and reporting;
- Implementing the Compact through water use permitting and regulating diversions of Great Lakes Basin waters;
- Helping communities plan water supply needs;
- Reviewing the construction and environmental impact of high capacity wells;
- Building a statewide water conservation and efficiency program;
- Developing and maintaining a statewide water resources inventory, including a better understanding of water loss and consumptive use in Wisconsin; and
- Providing information to the public on water withdrawal sources in Wisconsin, applications for new high capacity wells, and opportunities for public participation on significant Compact related proposals.

*Statewide water use registration and reporting*

Section 281.346(3), Wis. Stat., and Chapter NR 856, Wis. Adm. Code, requires people to register water withdrawals and report of water withdrawal data annually to the WDNR to support management of the state’s water resources.

### Registration

Any person who proposes to begin a new or increased withdrawal from waters of the state using a water supply system<sup>1</sup> with the capacity to withdraw 100,000 gallons per day (~ 70 gallons per minute) or more in any 30-day period, must register the withdrawal with the WDNR. Examples of water supply systems that may fall under this category include:

- All high capacity well properties;<sup>2</sup>
- Permitted (Wis. Stat. Chapter 30) surface water withdrawals;
- Any other properties statewide on which there is a water supply system with the capacity to withdraw an average of 100,000 gallons per day or more in any 30-day period from surface water or groundwater.

Prior to the effective date of the Compact, December 8, 2008, any approved and permitted water supply systems with a capacity to withdraw at least 100,000 gallons per day through several programs were automatically registered with the WDNR. Following implementation of the Compact, all new or increased withdrawals that meet the withdrawal threshold must register with the WDNR prior to withdrawing groundwater or surface water. This is typically done in conjunction with other approval or permitting procedures. As of 2024, WDNR has approximately 15,400 registered withdrawal sources statewide, of which, approximately 14,300 are wells and 1,100 are surface water sources. The public may search for water withdrawal locations through WDNR’s [water quantity data viewer](#).

### Reporting

In addition to registering water withdrawals, persons who make withdrawals from the waters of the state that average 100,000 gallons per day or more in any 30-day period must annually report to the WDNR the monthly volumes of the withdrawal.<sup>3</sup>

Owners with registered withdrawals must measure or estimate their monthly withdrawal volumes and report the previous calendar years’ monthly water use by March 1 of each year. Methods for measuring water for reporting purposes are outlined in s. NR 856.31, Wis. Adm. Code. Owners report on-line or through mailed copies. Reporting response rate is

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<sup>1</sup> “Water supply system,” when not preceded by “public,” means one of the following: 1. Except as provided in subd. 2., the equipment handling water from the point of intake of the water to the first point at which the water is used. 2. For a system for providing a public water supply, the equipment from the point of intake of the water to the first point at which the water is distributed. Wis. Stat. § 281.346(1)(wp).

<sup>2</sup> Section NR 812.07(51), Wis. Adm. Code, defines “high capacity property” as “one property on which a high capacity well system exists or is to be constructed.” Further, s. NR 812.07(53) defines “high capacity well system” as “one or more wells, drillholes or mine shafts used or to be used to withdraw water for any purpose on one property, if the total pumping or flowing capacity of all wells, drillholes or mine shafts on one property is 70 or more gallons per minute based on the pump curve at the lowest system pressure setting, or based on the flow rate from a flowing well or wells.”

<sup>3</sup> Pursuant to Wis. Stat. s. 281.346 and Ch. NR 820, Wis. Adm. Code, high capacity well owners must annually report withdrawals to the WDNR, regardless of withdrawal volume. Further, under Ch. NR 860, Wis. Adm. Code, water use permittees must also annually report withdrawals, regardless of volume.

consistently around 92%. These reports are stored in a database and analyzed for errors and inconsistencies.

Wisconsin summarizes water use reporting data annually and [reports](#) are available on the WDNR's website. Water use information is available to the public by source or aggregated through the WDNR's online [water withdrawal data portal](#) and geospatially through the [water quantity data viewer](#). Water use data are provided upon request to governmental partners, researchers, businesses and private individuals.

The Regional Body and Compact Council Water Use Reporting Protocols require that States and Provinces report aggregate water use to the Great Lakes Commission annually to include in the Great Lakes Water Use report. Wisconsin provides this information annually by the specified August 15 deadline.

### *Water Use Permitting*

Sections 281.346(4m), (4s), and (5), and Chapter NR 860, Wis. Adm. Code, establish the process, requirements and criteria for implementing water use permitting. A water use permit is required before persons may withdraw water in quantities that average 100,000 gallons per day or more in any 30-day period from groundwater or surface water (including streams, rivers, inland lakes, Lake Michigan, and Lake Superior) in the Great Lakes basin.

WDNR approved coverage for 912 water withdrawals to operate under Water Use General Permit No. 1 and 309 water withdrawal to operate under Water Use General Permit No. 2. WDNR has issued 326 Individual Water Use Permits. The General Permits will be reissued in 2036 and individual permits are valid for 10 years. In 2021 WDNR reviewed and reissued all active Individual Water Use Permits.

### *Water use permits for pre-existing withdrawals*

In Wisconsin, water use permitting requirements began on December 8, 2011. WDNR issued automatic coverage under Water Use General Permit No. 1 to persons in the Great Lakes Basin with the capacity to withdraw an average of 100,000 gallons per day or more, but less than 1 million gallons per day, in any 30-day period. WDNR issued automatic Water Use Individual Permits to persons with a water supply system or systems on one property or a public water supply system having approval to withdraw at least 1 million gallons of water per day for any 30 consecutive days.

The automatic permits included a baseline, set at the maximum hydraulic capacity of the most restrictive component of the water supply system or a withdrawal limit contained in a permit or approval as of December 8, 2008. Wis. Stat. § 281.346(4e). (For baselines, *see* Wis. Stat. § 281.346(2)(e)). The automatic permits issued in December 2011 also included an authorized withdrawal amount, which was based on the maximum hydraulic capacity of the most restrictive component of the water supply system or a withdrawal limit contained in an approval or other permit. If a person proposes to modify their authorized withdrawal amount before December 8, 2021 so that it equals 1 million gallons per day or more over

the baseline for any 30 consecutive days, the withdrawal had to meet the State Decision-Making Standard (Wis. Stat. § 281.346(5)(f)1.). If a person proposes to modify the withdrawal before December 8, 2021, so that it equals 10 million gallons per day or more over the baseline for any 30 consecutive days, the withdrawal had to meet the Compact Decision-Making Standard (Wis. Stat. § 281.346(5)(f)2.).

*Water use permits for new or increased withdrawals in the Great Lakes Basin*

After December 8, 2011, persons proposing new withdrawals averaging 100,000 gallons per day or more in any 30-day period or proposing to increase an existing withdrawal so that it will equal 100,000 gallons per day or more in any 30-day period (but will not equal at least 1 million gallons per day for any 30 consecutive days) must apply for and receive coverage under the Water Use General Permit No. 2. Persons proposing Great Lakes basin withdrawals that will equal at least 1 million gallons per day for any 30 consecutive days must apply for an Individual Water Use Permit and the state decision-making standard and conservation and efficiency measures apply.

If a person proposes to increase a withdrawal above the withdrawal amount authorized in an existing permit, the person must apply to modify the permit and implement water conservation and water use efficiency measures related to the new or increased source. Beginning December 8, 2011, coverage under the Water Use General Permit No. 2 is accompanied by a notice of coverage (NOC) letter that includes: an authorized withdrawal amount, requirements for reporting water use, and a copy of the required water conservation and efficiency measures.

Public notice and comment are required for each individual water use permit application. Any interested party may also request a public hearing on an individual water use permit. If a new general permit is proposed by WDNR, public notice and comment on the proposed general permit is also required.

Persons receiving coverage under Water Use General Permit<sup>4</sup> must satisfy the following requirements:

- Meet water conservation requirements in Wis. Adm. Code ch. NR 852;
- Ensure the water withdrawal is consistent with an approved water supply service area plan, if a plan is required; and
- Receive all necessary permits or approvals for the withdrawal under Wis. Stat. §§ 30.12, 30.18, 281.34, 281.35, 283.31, and 281.41, or § 281.17, 2001 Stats.
  - WDNR may only issue an individual permit if all the following requirements are satisfied:
    - The person withdrawing water will meet water conservation requirements in Wis. Adm. Code ch. NR 852;
    - The water withdrawal is consistent with an approved water supply service area plan, if a

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<sup>4</sup> These are the permit requirements for General Permit 2 – which is applicable for proposed new or increased water withdrawals. General Permit 1 applied to withdrawer that existed at the time of the Compact ratification and General permit 3 applies to temporary construction dewatering.



plan is required;

- The person withdrawing water has all necessary permits or approvals for the withdrawal under Wis. Stat. §§ 30.12, 30.18, 281.34, 281.35, 283.31, and 281.41, or §. 281.17, 2001 Stats.;
- The withdrawal meets the state decision-making standard or compact decision-making standard, if applicable; and
- If applicable, WDNR has provided notice to the Regional Body and if required, WDNR has considered the Regional Review declaration.

Wisconsin’s water use permits reference several other water management regulations. Most proposed water withdrawals are reviewed based on these additional regulations.

Statute Section	Subject	Standards
30.12	Structure and deposits in navigable waters	<ul style="list-style-type: none"> <li>- Establishes standards for general permits and individual permits</li> <li>- Establishes exemptions from permit requirements</li> </ul>
30.18	Withdrawal of water from lakes and streams	<ul style="list-style-type: none"> <li>- Applies to withdrawals of any amount for maintaining flow or lake level, and for agriculture or irrigation</li> <li>- Withdrawals may not injure public rights</li> </ul>
281.34	Groundwater withdrawals	<ul style="list-style-type: none"> <li>- Applies to withdrawal of 100,000 gallons per day or more</li> <li>- Approval conditions or denials may be necessary to avoid significant adverse impacts for withdrawals that: fall within a groundwater protection area, impact a spring, result in 95% water loss, impact a municipal well, impact groundwater quality or quantity.</li> </ul>
281.41	Wastewater Treatment Plant Plans	<ul style="list-style-type: none"> <li>- Requires plan and specification approval for reviewable projects</li> </ul>

Water Loss and Consumptive Use

“Consumptive Use” is “a use of water that results in the loss of or failure to return some or all of the water to the basin from which the water is withdrawn due to evaporation, incorporation into products, or other processes.” § 281.346(1)(e), Wis. Stat. WDNR uses consumptive use coefficients, as outlined in ch. NR 142, Wis. Adm. Code, to calculate consumptive use. WDNR estimates consumptive uses on an annual basis, based on water use coefficients and reporting data. Site specific data for consumptive use may be



submitted to the department by the withdrawer. WDNR also refers to tables within United States Geological Survey (USGS) publications SIR 2007-5197 and Fact Sheet 2008-3032 for consumptive use coefficient information.

In addition to the water use permits, water loss approvals are required statewide for new or increased withdrawals from groundwater or surface water that will result in a water loss averaging more than 2 million gallons per day in any 30-day period. § 281.35, Wis. Stat. WDNR must determine the following in order to issue a water loss approval:

- No public water rights in navigable water will be adversely affected;
- The proposed withdrawal does not conflict with any applicable plan for future uses of the waters of the state;
- The applicant's current water use and proposed plans incorporate reasonable conservation practices;
- The proposed withdrawal and uses will not have a significant adverse impact on the environment and ecosystem of the Great Lakes basin or the upper Mississippi River basin;
- The proposed withdrawal and uses are consistent with the protection of public health, safety and welfare and will not be detrimental to the public interest; and
- The proposed withdrawal will not have a significant detrimental effect on the quantity and quality of waters of the state.

In addition, if the proposed withdrawal will result in an interbasin diversion and water loss applies, WDNR must determine all of the following:

- Each state or province to which the water will be diverted has developed and is implementing a plan to manage and conserve its own water quantity resources, and that further development of its water resources is impracticable or would have a substantial adverse economic, social or environmental impact;
- It will not impair the ability of the Great Lakes basin or upper Mississippi River basin to meet its own water needs;
- The interbasin diversion alone, or in combination with other water losses, will not have a significant adverse impact on lake levels, water use, the environment or the ecosystem of the Great Lakes basin or upper Mississippi River basin; and
- The proposed withdrawal is consistent with all applicable federal, regional and interstate water resources plans.

Persons with water loss approvals must annually report water loss to WDNR. WDNR publishes a public notice upon receipt of a complete water loss application.

### Diversions

A "diversion" is "a transfer of water from the Great Lakes basin into a watershed outside the Great Lakes basin, or from the watershed of one of the Great Lakes into that of another, by any means of transfer, including a pipeline, canal, tunnel, aqueduct, channel, modification of the direction of a water course, tanker ship, tanker truck, or rail tanker except that the "diversion" does not include any of the following:

- The transfer of a product produced in the Great Lakes basin or in the watershed of one of the Great Lakes, using waters of the Great Lakes basin, out of the Great Lakes basin, or out of that watershed.
- The transmission of water within a line that extends outside the Great Lakes basin as it conveys water from one point to another within the Great Lakes basin if no water is used outside the Great Lakes basin.
- The transfer of bottled water from the Great Lakes basin in containers of 5.7 gallons or less.” § 281.346(1)(h), Wis. Stat.

WDNR issued grandfathered diversion approvals to water supply systems that diverted water prior to December 8, 2008. For the diversion approvals that returned water to the Great Lakes basin, the authorized diversion amount identified in the approval was based on the amount of water necessary to provide water for public water supply purposes within a sewer service territory that provides for the return of wastewater to the Great Lakes basin and that is specified in the sewer service area provisions of an area-wide water quality management plan approved by WDNR before December 31, 2007. The approved diversion amounts for these public water systems were based on approved sewer service areas, and population and related water supply service projections for build-out conditions in those communities. *See* § 281.344(3e) and (3m), Wis. Stat. For diversion approvals that discharge wastewater to the Mississippi River basin, the diversion amount was based on the maximum hydraulic capacity of the most restrictive component of the water supply system. *See* § 281.343(4t)(b), Wis. Stat.

Relevant provisions of the Compact and s. 281.346(4), Wis. Stat., govern diversions in the state. No person may begin a diversion, unless as authorized under s. 281.346(4), Wis. Stat., and no person may increase the amount of a diversion over the diversion amount specified in an approval under that subsection without prior approval from WDNR. For each diversion application, WDNR is required to provide public notice, offer a public comment period, and hold a public hearing if requested. WDNR is required to provide access to information on diversion applications. To facilitate public access to information on diversion applications, WDNR has provided a webpage for each diversion application and posted all official correspondence between WDNR and the applicant on these webpages. WDNR has an electronic subscription for members of the public interested in Great Lakes Compact issues. Public notices related to diversion applications are also provided via email to the Great Lakes Compact issues electronic subscription list. The list currently has more than 7,500 subscribers.

WDNR has approved three straddling community diversion applications since 2008, including the City of [New Berlin \(approved in 2009\)](#), the [City of Racine](#) (approved in 2018), and the [Village of Somers](#) (approved in 2022). All straddling community diversion are required to return their treated wastewater to the Great Lakes less an allowance for consumptive use.

In 2012 and 2013, WDNR approved intrabasin transfers for Enbridge to conduct hydrostatic testing of pipeline segments between Superior, WI and Sarnia, ON and between Superior, WI and Mokena, IL. WDNR required that all water was discharged into

Lake Huron and Lake Michigan. WDNR notified the Regional Body of these intrabasin transfers through email correspondence.

WDNR has approved one community in a straddling county diversion application since 2008. WDNR issued the City of Waukesha a diversion approval in 2021 after the City of Waukesha received approval from the Compact Council in 2016 and obtained all necessary federal and state approvals and permits to implement the diversion. The City of Waukesha began diverting water in 2023, and WDNR submitted its first annual report on the diversion to the Compact Council in August 2024. The City of Waukesha is required by condition of approval to return approximately 100% of the volume of diverted water to the Great Lakes Basin.

## **2. Describe specifically how Water Withdrawals in the State are managed by:**

### *a. Sector*

Each withdrawal source and property is assigned a [water use code](#). Water use codes that represent specific sectors are assigned based on the purpose for which most of the water is used. For the most part, water withdrawals in Wisconsin are not regulated by sector but are regulated based on water source, quantity, and location. There are a few exceptions: 1) surface water withdrawals of any amount from a stream for the purposes of agriculture or irrigation are regulated under s. 30.18, Wis. Stat.; 2) water conservation and efficiency requirements differ among sectors under ch. NR 852, Wis. Adm. Code; and 3) the public water supply sector is subject to a separate set of requirements<sup>5</sup> and is also regulated by the Public Service Commission of Wisconsin.

### *b. Water source*

#### *i. Surface water withdrawals (Lake Michigan, Lake Superior, and other surface waters)*

Surface water withdrawals are required to register if the water system has the capacity to withdraw 100,000 gallons per day. Surface water withdrawals with the capacity to withdraw 100,000 gallons per day are required to report withdrawals over 100,000 gallons per day. Surface water withdrawals are also managed under s. 30.18, Wis. Stat. WDNR regulates surface water withdrawals of any amount from streams for purposes of agriculture or irrigation (§ 30.18(2)(a)2., Wis. Stat.); withdrawals of any amount from a stream to maintain or restore lake levels or stream flows (§ 30.18(2)(a)1., Wis. Stat.); and withdrawals from a stream or lake resulting in a water loss of more than 2 million gallons per day in any 30-day period (§ 30.18(2)(b), Wis. Stat.). An individual permit is required for withdrawals falling into any of the categories above. WDNR evaluates permit applications to ensure that the proposed withdrawals do not injure public rights in navigable waters and either withdraw only surplus water or have the consent of all possibly adversely affected riparian owners. § 30.18(5), Wis. Stat.

#### *ii. Groundwater withdrawals*

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<sup>5</sup> Including chs. NR 809, 810 and 811, Wis. Adm. Code.

Groundwater withdrawals are required to register if the water system has the capacity to withdraw 100,000 gallons per day. Groundwater withdrawal sources with the capacity to withdraw 100,000 gallons per day are required to report water withdrawals of any volume. Groundwater withdrawals are further regulated under ch. 281, Wis. Stat., chs. NR 812 and 820, Wis. Adm. Code, and related case law. All public and private wells, except those community water system wells that are subject to separate regulations, are subject to ch. NR 812, Wis. Adm. Code regulations that govern their location and provide standards and requirements for well construction, pump installation, and water treatment. High capacity wells are those with a capacity of more than 100,000 gallons per day from one or more wells on a system or contiguous property. As part of the high capacity well application process, WDNR is required to undertake an environmental review if the proposed well may impact a spring with a normal flow of 1 cubic foot per second; is in a groundwater protection area (i.e., is within 1,200 feet of a trout stream or outstanding or exceptional resource water); or will have a water loss of more than 95 percent of the amount withdrawn. *See* Wis. Stat. § 281.34(4) and (5). Additionally, WDNR conducts a case-by-case analysis of all high capacity well applications that considers the needs of the property and the environmental effects that the proposed high capacity well may have on the waters of the state, individually and combined with existing environmental impacts. A complete description of the review process can be found at <https://dnr.wisconsin.gov/topic/Wells/HighCap>

*c. Quantity*

Water withdrawals are required to register if the water system has the capacity to withdraw 100,000 gallons per day. Groundwater withdrawal sources with the capacity to withdraw 100,000 gallons per day are required to report water withdrawals of any volume. Surface water withdrawals with the capacity to withdraw 100,000 gallons per day are required to report withdrawals over 100,000 gallons per day.

New or increased water withdrawals in the Great Lake Basin proposing to withdraw between 100,000 gallons per day and 1,000,000 gallons per day for 30 consecutive days are required to receive coverage under a general water use permit. New or increased water withdrawals in the Great Lakes Basin proposing to withdraw 1,000,000 gallons per day for 30 consecutive days or more are required to obtain an individual water use permit and are subject to the state decision-making standard. New or increased water withdrawals in the Great Lakes Basin proposing to withdraw 10,000,000 gallons per day for 30 consecutive days are subject to the Compact decision-making standard.

*d. Location*

The primary geographical distinction affecting water withdrawal management in Wisconsin is that between withdrawals and uses in the Great Lakes basin (Lake Michigan and Lake Superior basins) and withdrawals and uses outside of the basin (i.e., in the Upper Mississippi River basin). Regulations specific to the Great Lakes basin include: water use permits, mandatory conservation and efficiency plans, diversion prohibitions, and regional notification and review procedures. These additional Great Lakes requirements are discussed below.

*e. Any specific exemptions as allowed in the Agreement and the Compact*

The scope and thresholds for the water management program are described above.

Wisconsin's Compact-implementing legislation does not include any specific exemptions to the water management program.

**3. Description of how the provisions of the Standard of Review and Decision are applied. The description should include information on how each criterion of the Decision-Making Standard and Exception Standard is addressed.**

*a. State decision-making standard*

Under s. 281.346(5), Wis. Stat., WDNR may not approve an application for a new withdrawal that will equal at least 1 million gallons per day for any 30 consecutive days, or for an existing withdrawal that is not covered by a general permit that is proposed to be modified so that it will equal at least 1 million gallons per day for any 30 consecutive days, unless the withdrawal meets the state decision-making standard.

To meet the state decision-making standard, applicants for a new or increased withdrawal must attach documentation describing how the withdrawal will be implemented such that the following criteria, listed in s. 281.346(5m), Wis. Stat., are met:

- The amount of the withdrawal or increase in the withdrawal is needed to meet the projected needs of the person who will use the water.
- For an increase in a withdrawal, cost-effective conservation practices have been implemented for existing uses of the water, consistent with ch. NR 852, Wis. Adm. Code.
- The applicant has assessed other potential water sources for cost-effectiveness and environmental effects.
- Cost-effective conservation practices will be implemented to ensure efficient use of the water;
- One of the following applies:
  - o No significant adverse environmental impacts to waters of the state will result;
  - o If the withdrawal is from a surface water body, the withdrawal will not result in the violation of water quality standards under s. 281.15, Wis. Stat., or impair fish populations;
  - o WDNR has issued a permit under s. 30.18, Wis. Stat., for the new or increased withdrawal or has issued a permit under s. 30.12, Wis. Stat., for a structure that will be used for the new or increased withdrawal; or
  - o WDNR has issued an approval under § 281.34, Wis. Stat., or § 281.17, 2001 Stats., for the new or increased withdrawal.

Under s. NR 860.31(3)(a)12., Wis. Adm. Code, an applicant for an individual water use permit that is subject to the state decision-making standard must submit to WDNR

additional information and documentation including:

- Documentation that the proposed withdrawal amount is needed to meet the applicant's projected needs;
- Documentation of compliance with the applicable provisions of ch. NR 852, Wis. Adm. Code (Water Conservation & Water Use Efficiency);
- An alternatives analysis comparing other potential water sources for cost-effectiveness and environmental effects;
- A description of the baseline conditions of the source including hydrologic flow, water quality, and for surface water sources, habitat of the source (not required if there is a permit or approval under ss. 30.12, 30.18, or 281.34, Wis. Stat.); and an assessment of the potential impacts of the withdrawal on the waters of the state (not required if there is a permit or approval under ss. 30.12, 30.18, or 281.34, Wis. Stat.).

An applicant must comply with all the above state decision-making standard requirements prior to the proposed withdrawal.

Since December 8, 2011, the WDNR has reviewed and approved one application for an individual permit and the WDNR has reissued two water loss approval in the Lake Michigan basin.

b. *Compact decision-making standard*

Under Wis. Stat. s. 281.346(5), WDNR may not approve an application for a new withdrawal that will equal at least 10 million gallons per day for any 30 consecutive days, or for an existing withdrawal that is not covered by a general permit and that is proposed to be modified so that it will equal at least 10 million gallons per day for any 30 consecutive days, unless the withdrawal meets the Compact decision-making standard.

However, the state decision-making standards apply if the person proposing a new or increased withdrawal to which the Compact decision-making standard would otherwise apply, demonstrates using procedures in s. 142.06, Wis. Adm. Code, that the water loss would average less than 5 million gallons per day in every 90-day period. § 281.346(5)(f), Wis. Stat.

To meet the Compact decision-making standard, an applicant must demonstrate the following, as required by s. 281.346(6), Wis. Stat.:

- All of the water withdrawn from the Great Lakes basin will be returned to the source watershed, less an allowance for consumptive use;
- The withdrawal will result in no significant adverse individual impacts or cumulative impacts to the quantity or quality of the waters of the Great Lakes basin, to water dependent natural resources, to the source watershed, or, if the withdrawal is from a stream tributary to one of the Great Lakes, to the watershed of that stream;
- The withdrawal will be implemented in a way that incorporates environmentally

sound and economically feasible water conservation measures;

- The withdrawal will be in compliance with all applicable local, state, and federal laws and interstate and international agreements, including the Boundary Waters Treaty of 1909; and
- The proposed use of the water is reasonable, based on a consideration of all of the following:
  - Whether the proposed withdrawal is planned in a way that provides for efficient use of the water and will avoid or minimize the waste of water;
  - If the proposal would result in an increased water loss, whether efficient use is made of existing water supplies;
  - The balance of the effects of the proposed withdrawal and use, and other existing or planned withdrawals and water uses from the water source, on economic development, social development, and environmental protection;
  - The supply potential of the water source, considering quantity, quality, reliability, and safe yield of hydrologically interconnected water sources;
  - The probable degree and duration of any adverse impacts caused or expected to be caused by the proposed withdrawal and use, under foreseeable conditions, to other lawful consumptive uses or nonconsumptive uses of water or to the quantity or quality of the waters of the Great Lakes basin and water dependent natural resources, and the proposed plans and arrangements for avoidance or mitigation of those impacts; and
  - Any provisions for restoration of hydrologic conditions and functions of the source watershed or, if the withdrawal is from the stream tributary to one of the Great Lakes, of the watershed of that stream.

Under s. NR 860.31(3)(a)13., Wis. Adm. Code, an applicant for an individual water use permit that is subject to the compact decision-making standard must submit to WDNR additional information and documentation including:

- An assessment of the potential impacts of the withdrawal on the waters of the state and water dependent natural resources including wetlands, and possible modeling of anticipated hydrologic impacts or water quality evaluation to determine if the withdrawal or return flow will meet established water quality standards;
- Documentation of compliance with the applicable provisions of ch. NR 852, Wis. Adm. Code;
- Documentation of compliance with all applicable local, state, and federal laws, rules, and regulations, and interstate and international agreements, including the Boundary Waters Treaty of 1909;



- An analysis of the efficiency of the proposed water use, and if there is an expected increase in water loss, an analysis of the efficiency of the use of existing water supplies. The analysis shall include a comparison of the proposed water use intensity with the water use intensity of similar facilities or operations. The analysis may include information from the water conservation plan prepared in compliance with s. NR 852.07, Wis. Adm. Code;
- An analysis of the impacts of the withdrawal over the next ten years on economic development, social development, and environmental protection taking into consideration other existing and planned withdrawals from the same source.
- The supply potential of the water source including quality, quantity, and reliability taking into consideration interconnected water sources and water dependent natural resources; and
- A description of mitigation measures that will be implemented to prevent or eliminate significant impacts.

Applicants must comply with all the above Compact decision-making standard requirements prior to the proposed withdrawal. Since the effective date of the Compact, no permit applications have been submitted in Wisconsin that required compliance with the Compact decision-making standard.

*c. Exception standard for diversions*

The Exception Standard for Diversions that has been integrated into Wisconsin’s Compact-implementing legislation mirrors the Exception Standard in the Compact and Agreement with a few additions:

1. The proposal for a diversion must be consistent with an approved water supply service area plan under s. 281.348, Wis. Stat., that covers the public water supply system, unless the proposal is to provide water to a straddling community that includes a designated electronics and information technology manufacturing zone. § 281.346(4)(c)2m. and (e)1.em., Wis. Stat.
2. The place at which the water is returned to the source watershed must be as close as practicable to the place from which it is withdrawn, unless that place is not economically feasible, not environmentally sound, or not in the interest of public health. § 281.346(4)(f)3m., Wis. Stat.
3. If the water will be returned to the source watershed through a stream tributary to one of the Great Lakes, the physical, chemical, and biological integrity of the receiving water will be protected and sustained, considering the state of the receiving water before the proposal is implemented and considering both low and high flow conditions and potential adverse impacts due to changes in temperature and nutrient loadings. § 281.346(4)(f)4m., Wis. Stat.
4. Wisconsin has defined “reasonable water supply alternative” to mean “a water supply alternative that is similar in cost to, and as environmentally sustainable and protective of public health as, the proposed new or increased diversion and that does

not have greater adverse environmental impacts than the proposed new or increased diversion.” § 281.346(1)(ps), Wis. Stat.

**4. Overview of State reporting and database of Withdrawals, Consumptive Uses and Diversions including implementation status and database elements and capabilities, and reporting mechanisms (e.g., electronic submission, etc.). The overview should include methods of measurement (e.g., flow volume or rate meters, flow gauging, timing devices, etc.) approved by the State/Province for measuring Water volumes.**

Registered water users must annually report monthly withdrawal amounts for each calendar year by March 1 of the following year. § NR 856.30(2), Wis. Adm. Code. Each report contains monthly withdrawal amounts, the primary use of the water and the method used to measure or estimate the water use, consistent with requirements for reporting to the Great Lakes Commission (GLC). See § NR 856.30(2), Wis. Adm. Code. Registered withdrawers can report water use through a web-based application or using paper forms which are entered into the WDNR’s Water Use database.

In accordance with ss. NR 812.39(2), NR 820.13 and NR 856.31(1), wells with a pumping capacity of 100,000 gallon per day (70 gallons per minute) or more shall be equipped with a means of accurately measuring water withdrawal, typically an hour meter or totalizing flow meter. Unless otherwise specified in approval conditions, wells with a pumping capacity of less than 100,000 gallons per day (70 gallons per minute) may either be equipped with means of measuring water withdrawals or water use may be estimated using a method approved by WDNR. Surface water withdrawals are measured by totalizing flow meters or estimated using the [measurement instructions](#) provided to water use reporters. Other methods can be used if approved by WDNR if none of the existing methods is sufficient. § NR 856.31(1)(a)5. and (b)6., Wis. Adm. Code. WDNR provides [measurement instructions](#) to water use reporters.

Information about the primary use of the withdrawn water enables WDNR to assign water use codes. Water use codes are detailed codes specifying public water supply uses (municipal systems, community water systems, non-transient, non-community systems, transient, non- community systems and K-12 schools), industrial uses, commercial and institutional uses, power generation, irrigation, other agricultural uses, domestic supply and fire protection. Each WDNR water use fits under a more general Great Lakes Commission water sector for annual reporting to the Great Lakes Commission. A list of the water use codes can be found in the [Water Withdrawal Report Guidance](#).

WDNR has determined water loss coefficients for each water use code based on various sources such as USGS published values, ch. NR 142, Wis. Adm. Code, or assumed general practices.

In addition to reporting monthly withdrawal data to WDNR, persons with approved Great Lakes basin diversions are required to report the monthly volumes diverted and the volume returned to the Great Lakes basin. Withdrawal, diversion, and return flow volumes are tracked and reported to the Great Lakes Commission annually.

All water use data is housed in a dedicated geographic information system database that is updated by WDNR staff through a web-based application. Water use data is used to support WDNR decision-making and serves as the basis for annual withdrawal report summaries and sector specific studies. Water use data is available to the public through the [Water Quantity Data Viewer](#) and the [Water Withdrawal Query Tool](#). Governmental partners, university researchers, businesses and private individuals may also request data to be delivered in tabular or spatial formats.

- 5. Include a web link to the State or Province’s Withdrawal application form(s). In addition, include a section on web access to additional information on the program, link to any application forms and links to tools for improving the management of water resources or sharing information about water withdrawals.**

Throughout this document, WDNR has provided links to water use program web pages, applications, tools and program information related to water withdrawals.

- 6. Summary description of the State’s or Province’s initiatives to support an improved scientific understanding of the Waters of the Basin and an improved understanding of the groundwater of the Basin and the role of groundwater in Basin water resource management. A description of State or Provincial initiatives or mechanisms to support an improved understanding of individual or cumulative impacts of Withdrawals, Consumptive Uses and Diversions on the Basin ecosystem should also be provided.**

WDNR has supported a variety of projects to improve the understanding or management of groundwater and surface water quantity in Wisconsin. WDNR has continued or developed the following projects in the past 5 years:

- Wisconsin’s Long-Term Groundwater Level Monitoring Network –WDNR partners with the USGS and the Wisconsin Geological and Natural History Survey (WGNHS) to continue [monitoring water levels](#) in aquifers across Wisconsin with a network of approximately 100 monitoring wells. Data collected from this network are used for monitoring local water resources, assessing aquifer response to drought or flooding, calibrating groundwater flow models, and measuring the effect of pumping on groundwater levels.
- WDNR continues to maintain the [Water Quantity Data Viewer](#) and the [Water Withdrawal Query Tool](#) for the public to search water withdrawal data and related water quantity monitoring data. The WDNR’s water quantity data view shows the location and water levels associated with the statewide groundwater monitoring network.
- Following on the 2019 [Wisconsin Springs Inventory](#) of approximately 400 springs with flows greater than 0.25 cfs, WDNR continues to revisit and identify additional springs across the state. In addition, eight reference springs are monitored quarterly to develop a long-term record on spring flow variability and water chemistry. A summary of the springs inventory has also been published in a [final report](#).
- [Central Sands Lakes Study](#) – The Wisconsin legislature instructed WDNR to

evaluate and model the hydrology of Pleasant Lake, Plainfield Lake and Long Lake to determine whether existing and potential groundwater withdrawals are causing or are likely to cause a significant reduction of the lakes' water levels below their average seasonal levels. This area of Wisconsin straddles the Great Lakes Basin divide. The three-year study, in partnership with USGS, WGNHS, and the University of Wisconsin, found significant impacts to two of the three study lakes. WDNR issued findings and recommendations to state legislators in June 2021.

The study included a calibrated groundwater flow model of the designated study area that simulates the water budget associated with the three lakes and to evaluate their interactions with groundwater withdrawals. As part of the study, WDNR partnered with University of Wisconsin and the agricultural community to directly measure evapotranspiration, a critical component to consumptive use. The approach for determining significant impacts to the three lakes may be applicable throughout the Great Lakes basin for determining impacts to surface waters based on groundwater withdrawals.

WDNR developed several story maps in the past five years to communicate about Wisconsin Water Use and Management. These include:

- [A Decade of Wisconsin Water Withdrawals](#)
- [Wisconsin Groundwater](#)
- [Working Together to Collect Wisconsin Water Quantity Data](#)

## **Water Conservation and Efficiency Program Report**

### **1. Status of the State or Province's Water conservation and efficiency goals and objectives consistent with the Basin-wide goals and objectives. If developed, include State or Provincial goals and objectives or link to electronic version.**

Wisconsin adopted water conservation and efficiency goals and objectives that are consistent with the Basin-wide goals and objectives. The goals and objectives, which were first adopted in 2008 and most recently revised in 2011, can be found on the Department website at: [Wisconsin Statewide Water Conservation and Water Use Efficiency Goals](#)  
WDNR reviews these goals and objectives every five years.

### **2. Water Conservation and Efficiency Program Overview**

1. *Citations to State Water Conservation and Efficiency Program implementing laws, regulations, and policies.*

The Wisconsin Legislature ratified the Great Lakes—St. Lawrence River Basin Water Resources Compact (Compact) in 2007 Wisconsin Act 227. Wisconsin adopted additional water conservation and efficiency requirements that go beyond the minimum required by the Compact. These requirements are codified in s. 281.346(8), Wis. Stat., and ch. NR 852, Wis. Adm. Code. For Tier 1,<sup>6</sup> these requirements include programs such as water use audits,

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<sup>6</sup> Ch. NR 852, Wis. Adm. Code, includes a three-tier process for water conservation and efficiency requirements, depending on the type of withdrawal, diversion, or water loss.

leak detection and repair programs, information and education programs, source measurement. For Tier 2, additional requirements are dependent on the water sector. For Tier 3, an analysis and implementation of all cost-effective water conservation and efficiency measures must be implemented.

2. *Summary description of Wisconsin's Water Conservation and Efficiency Program including what elements are voluntary and mandatory.*

The Water Use Section of WDNR's Bureau of Drinking Water and Groundwater developed 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 requires mandatory water conservation and efficiency measures for new or increased withdrawals in the Great Lakes Basin, for any new or increased diversions from the Great Lakes Basin, and for any new or increased withdrawals—statewide—that will result in a water loss averaging more than 2 million gallons per day in any 30-day period. Voluntary water conservation and efficiency measures are encouraged for all existing water users throughout the state. Water conservation measures are required through municipal water systems through the Public Service Commission of Wisconsin water loss control program. This program includes requirements to meter all sales, maintain and verify the accuracy of meters, identify and repair leaks in the distribution system, control water usage from hydrants, maintain records of system pumpage and consumption and conduct an annual water audit.

The conservation and efficiency program is implemented through administrative rules, water use permits, and guidance developed in cooperation with the Public Service Commission of Wisconsin and the Wisconsin Department of Safety and Professional Services. Rules implementing the program, primarily ch. NR 852, Wis. Adm. Code, outline the necessary conservation and efficiency measures. Under ch. NR 852, Wis. Adm. Code, conservation and efficiency measures vary depending on the withdrawal amount and calculated water loss:

- For new or increased Great Lakes basin withdrawals averaging 100,000 gallons per day or more in any 30-day period but less than 1 million gallons for any 30 consecutive days, Tier 1 water conservation and efficiency requirements apply. § NR 852.04, Wis. Adm. Code, including Table 1.
- For new or increased Great Lakes basin withdrawals equaling 1 million gallons per day or more for any 30 consecutive days, Tier 1 (see above) and Tier 2 water conservation and efficiency requirements apply. § NR 852.05, Wis. Adm. Code, including Table 2.
- For new or increased withdrawals (statewide) resulting in a water loss averaging more than 2 million gallons per day in any 30-day period; or for new or increased Great Lakes diversions, in addition to Tier 1 and Tier 2 requirements, Tier 3 water conservation and efficiency requirements are required—including an analysis to determine whether additional cost-effective conservation and efficiency measures are available (other than those in Tier 1 and Tier 2). § NR 852.06, Wis. Adm. Code.

The Public Service Commission of Wisconsin also relies on administrative rules (chs. PSC

184 and PSC 185, Wis. Adm. Code) for authorizing and monitoring voluntary water conservation programs for municipal water systems. For other withdrawals subject to mandatory water conservation and efficiency, requirements increase as the volume of withdrawal increases.

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. Plans are required immediately for any Great Lakes Basin public water systems serving populations of 10,000 or more that are seeking a new or increased withdrawal, and for applicants for diversions of Great Lakes water, except that a water supply service area plan is not required for a proposed diversion to a straddling community that includes an electronics and manufacturing technology zone.

- 3. For each of the regional objectives, identify how the State/Provincial program is consistent with the regional objective, and a description of how the State or Province promotes Environmentally Sound and Economically Feasible Water Conservation Measures. More details for each objective are available at [http://www.glsregionalbody.org/Docs/Resolutions/GLSLRWRRB\\_Resolution\\_6-Conservation-Efficiency.pdf](http://www.glsregionalbody.org/Docs/Resolutions/GLSLRWRRB_Resolution_6-Conservation-Efficiency.pdf) and can be provided in the table below.**

As shown in the table below, the Wisconsin program is consistent with the regional objectives in the promotion of environmentally sound and economically feasible water conservation measures.

<b>OBJECTIVES</b>	<b>LEGISLATIVE OR PROGRAM DESCRIPTION</b>
Guide programs toward long- term sustainable water use.	<ul style="list-style-type: none"> <li>▪ Adoption of Water Conservation and Water Use Efficiency Rules. ch. NR 852, Wis. Adm. Code (1/1/2011).</li> <li>▪ Mandatory water conservation plans and conservation and efficiency measures for new or increased Great Lakes Basin withdrawals, all diversions of Great Lakes water, and withdrawals with a water loss of more than 2 million gallons per day.</li> <li>▪ Water Supply Service Area Planning. § 281.348, Wis. Stat.; ch. NR 854, Wis. Adm. Code.</li> </ul>
Adopt and implement supply and demand management to promote efficient use and conservation of water resources.	<ul style="list-style-type: none"> <li>▪ The Public Service Commission of Wisconsin rules include requirements for all public water utilities to meter customer water use, test meter accuracy, conduct annual water audits, and identify and repair leaks.</li> <li>▪ Required water conservation plans are in place for approximately 200 water use permittees.</li> <li>▪ Drought management and conservation <a href="#">webpage</a>.</li> </ul>

<p>Improve monitoring and standardize data reporting among State and Provincial water conservation and efficiency programs.</p>	<ul style="list-style-type: none"> <li>▪ Developed a new database for water use data.</li> <li>▪ Developed an on-line registration and reporting system, with ongoing system refinement. On-line reporting is available for all registered water users and reporting forms are mailed to those who choose not to report on-line. On- line system automated quality checks continue to improve reporting quality.</li> <li>▪ Water use data by source and aggregated is available on the <a href="#">WDNR water use webpage</a>.</li> <li>▪ WDNR is implementing a USGS Water Use data and research grant 2023-2025 to improve water use data quality and pilot developing a water supply service area geographical information systems layer.</li> </ul>
<p>Develop science, technology, and research.</p>	<ul style="list-style-type: none"> <li>▪ Co-funded a project with the Public Service Commission of Wisconsin titled “Water Efficiency Potential Study for Wisconsin,” which was completed in late 2011.</li> <li>▪ Funded a project titled “Ecological Limits of Hydrologic Alteration” focused on understanding stress to fish populations due to reduced stream flows.</li> <li>▪ Funded a project to develop a hydrogeologic data viewer for Wisconsin hydrogeologic data.</li> <li>▪ Funded a “proof-of-concept” hydrological model to optimize stream flow, withdrawals and crop rotations in a small watershed in central Wisconsin.</li> <li>▪ Funded a project entitled “Impacts of potato and maize management and climate change on groundwater recharge across the Central Sands” to better understand impacts of groundwater dependent agro-ecosystems.</li> <li>▪ Funded a project to compile groundwater and lake level data for Wisconsin and develop statistical models to understand linkages between groundwater, climate and water levels of seepage lakes.</li> <li>▪ Conducting a study authorized by the Wisconsin legislature to evaluate and model the potential impacts of groundwater withdrawals on three specific lakes in Central Sands region of Wisconsin.</li> <li>▪ Evaluated remote sensing evapotranspiration models for use in Wisconsin and evaluated differences in evapotranspiration rates relative to agricultural practices.</li> <li>▪ Partially installation and operation of eddy covariance towers to directly measure evapotranspiration.</li> <li>▪ Ongoing delivery of spatial water use data to governmental and university partners for use in modeling projects and scientific research.</li> <li>▪ Funded a pilot groundwater flow model that allows for incorporation of management objectives in a groundwater stress area of Wisconsin.</li> <li>▪ Updated <a href="#">inventory of 400 springs</a> in Wisconsin with flows greater than 0.25 cubic feet per second. Recently published by the Wisconsin Geological and Natural History Survey – <a href="#">An inventory of Springs in Wisconsin</a>.</li> <li>▪ Worked with the USGS Upper Midwest Water Science Center to develop Python tools for streamflow depletion and aquifer drawdown analysis that allows for more flexibility and efficiency in high-capacity well application reviews.</li> </ul>



Develop education programs and information sharing for all water users.	<ul style="list-style-type: none"> <li>▪ Promotion of EPA <i>WaterSense</i> Fix-a-Leak, including webpage, promotional video, social media posts.</li> <li>▪ Initiated a program of water use benchmarks for geographic and sector specific withdrawals.</li> <li>▪ Promoting irrigation conservation at Farm Technology Days. This includes promotion of irrigation scheduling tools developed by the University of Wisconsin.</li> </ul>
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**4. Description of the State or Provincial Water conservation and efficiency program implementation timeline and status.**

Wisconsin completed its Water Conservation and Efficiency Goals and Objectives in 2008 and updated these Goals and Objects for statewide application in 2011. Wisconsin’s administrative rules for Water Conservation and Efficiency, ch. NR 852, Wis. Adm. Code, became effective in January 2011. A Water Conservation and Efficiency webpage is available at the [WDNR website](#) and at the [Public Service Commission of Wisconsin website](#). Wisconsin promotes “Fix a Leak Week” annually. Water conservation plan requirements are integrated into the water use permit review and issuance process.

**5. Consultation with Wisconsin federally recognized Tribes and public comment period**

Wisconsin DNR accepted comments on the draft Wisconsin Water Management and Water Conservation and Efficiency Program Review between October 3, 2024 and November 15, 2024. Wisconsin offered a virtual meeting with federally recognized Tribes in Wisconsin on October 30, 2024 to discuss the draft program review. Comments received are incorporated into this revised draft.

## Appendix A

### Comment and Response to the 5-year water management program review

**Comment:** Require rain barrels in every home and business in Waukesha before increasing diversion.

**Response:** Comment noted. Waukesha is required to have a [water conservation and efficiency plan](#) that they report on annually and revise every 10 years that meets the requirements of Wisconsin's Water Conservation and Efficiency Rule (Wis. Admin. Code ch. NR 852). The Rule requires implementation of the following water conservation and efficiency measures: water audits, leak detection and repair program, information and education outreach, source measurement, distribution system pressure management, residential demand management programs, commercial and industrial demand management programs, evaluation of water reuse, and implementation of water conservation and efficiency measures that are environmentally sound and cost effective.

**Comment:** Wisconsin water conservation goals and objectives are lacking.

**Response:** Comment noted.

**Comment:** Concerns over impacts to the Root River from the City of Waukesha wastewater discharge of treated effluent such as phosphorus, chloride, total suspended solids, pharmaceuticals, pathogens, micro-plastics, personal care products and flooding. The Environmental Impact Statement for the City of Waukesha diversion should be rewritten.

**Response:** The City of Waukesha's wastewater discharge to the Root River must meet the limits and conditions of their [Wisconsin Pollution Discharge Elimination System permit](#). Additionally the City of Waukesha is required to [conduct monitoring](#) of the Root River for flow, water quality and biological impacts for a minimum of 10 years from the start of the diversion.

**Comment:** Commentor provided article "A Test of the Great Lakes Compact: Environmental Justice and the Waukesha Diversion Return flow plan" – Cornell Policy Review. Commentor provided an annotated bibliography of articles discussing the impacts of wastewater effluent on impaired waters.

**Response:** Comment noted.

**Comment:** No additional diversion should be approved.

**Response:** Comment noted.

**Comment:** Current communities that have received diversion approvals under the Great Lakes Compact should submit annual plans for water conservation.

**Response:** The Cities of New Berlin, Racine, Waukesha, and the Village of Somers are all required to annually submit a report to the DNR on the implementation of the conditions of their approval. These reports include information on the implementation of their required water conservation and efficiency plans. These reports are available at the DNR Water Use webpage on the [Great Lakes Compact](#).

**Comment:** Caps should be placed on existing diversions so that no additional water is diverted.

**Response:** All diversion approvals include a maximum diversion amount.

**Comment:** Concern over water use permit and water loss approval thresholds and potential for incentivizing withdrawing water from a river rather than a Great Lake.

**Response:** Water Use Permits apply to any withdrawal in the Great Lakes Basin from groundwater, inland surface water or the Great Lakes. In addition to water use permits, water loss approvals are required for projects with consumptive uses of 2 million gallons per day or more.

**Comment:** Concern that there is a “state decision-making standard” and a “Compact decision-making standard” for different water volume thresholds.

**Response:** These standards and application of the standards are specified in Wis. Stat. § 281.346 (5) and (6). The department has received applications for water use permits requiring review under the state decision making standard for fewer than 20 permits and has not received any applications that meet the criteria for a review under the compact decision making standard. The thresholds for applying the compact decision making standard vary significantly in approach among the states.

**Comment:** The bullets on page 15 of the 5-year water management program review are confusing and should be rewritten.

**Response:** These bullets are the exact wording in Wis. Stat. § 281.346 (6) and the Great Lakes Compact and are included as written in statute and the Compact.

**Comment:** The commentor opposes the exemption of a water supply service area plan requirement for an electronics and information technology manufacturing zone.

**Response:** Comment noted. This is a statutory exemption included in the Wis. Stat. 281.346 (4) (c) 2m., and any changes would need to come through the legislative process.

**Comment:** “...When a permit is granted and the conditions change (who is using the water, to what end, and job creation) that the Department should have a way to reexamine a water diversion approval...”

**Response:** A diversion approval is issued to an applicant with the requirement that the applicant complies with all terms and conditions of the diversion approval. If circumstances change, a person with an approved diversion may request an amendment of the diversion under the requirements in Wis. Admin. Code ch. 851. Additionally, the department may take enforcement action for violations of terms of the diversion approval conditions.

**Comment:** Concern that “if the ‘state of the receiving water’ is poor that it is not required that the physical, chemical, and biological integrity of that stream should be protected.”

**Response:** All wastewater discharges are required to be treated to meet the conditions of their WPDES permit.

**Comment:** Commentor states that they do not agree with the Department’s interpretation of the Compact definition of “public water supply purposes” and that a diversion approval should be only for diverted water being served to residential uses.

**Response:** Comment noted.

## **Appendix B - Public Comments**

**From:** [Lou Davit](#)  
**To:** [DNR Compact Program Review](#)  
**Subject:** Water diversion efficiency  
**Date:** Wednesday, October 23, 2024 1:19:33 PM

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**CAUTION: This email originated from outside the organization.  
Do not click links or open attachments unless you recognize the sender and know the content is safe.**

Gentlemen

10/23/24

I would strongly encourage the requirement of rain barrels by every home and business in Waukesha before increased diversion of Lake Michigan water.

Lou Davit 4508 N. Woodburn St. Shorewood, WI

**From:** [David Fulwiler](#)  
**To:** [DNR Compact Program Review](#)  
**Subject:** These DNR proposals are lacking  
**Date:** Tuesday, October 15, 2024 9:28:12 PM  
**Attachments:** [A Test of the Great Lakes Compact Environmental Justice and the Waukesha Diversion Return Flow Plan.pdf](#)  
**Importance:** High

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**CAUTION: This email originated from outside the organization.  
Do not click links or open attachments unless you recognize the sender and know the content is safe.**

Dear Department of Natural Resources,

The states water use, conservation and efficiency goals are in my opinion lacking. This lack of diligence and scientific rigor in pursuing an outcome that comes closest to the Great Lakes Compact's (GLC) intent is obvious. the implemented plan endangers much of the investment made by the City of Racine in beautifying their cities portion of the Root River and harbor.

Many down stream have a great number of things that they stand to loose. The root River was already impaired for phosphorus according to the Department of Natural Resources (DNR). The water coming from Waukesha's Waste Water Treatment plant "will not return to Lake Michigan with out increased amounts of contaminants and nutrients: an increase in phosphorus loading, higher concentrations of chloride, higher concentrations of total suspended solids , pharmaceuticals, higher concentrations of residual pathogens, and other emerging contaminants like micro-plastics and and personal care products. " Reports Dr. Dr. Sandra McClellan in a peer reviewed article 'A Test of the Great Lakes Compact: Environmental justice and the Waukesha Water Diversion Plan' ". in the Cornell Policy Review. <https://www.cornellpolicyreview.com/waukesha-diversion/>

All of the modeling for how the diversion will respond to flooding and increases in the amount of effluent due to what we may receive in heavy rains as a result of climate change are not taken into account in the 2019 Environmental Impact Statement (EIS).

The entire EIS needs to be redone using updated models including the latest data on how climate change influences this water returning to Lake Michigan via the Root River. The effluent is not all that clean and when it is put into the Root River which the DNR says is already impaired for phosphorus? That's a losing idea.

I haven't the time to include the rest of my thoughts on this issue but I am including an annotated bibliography of items that show the dangers surrounding putting effluent into an impaired (for phosphorus) river.

Much of the Root River I grew up next to and played around and in would go dry, with large pools of standing water. That still happens today. Will there be deadly algae blooms in the pools of effluent filled water. Because this program began under the Scott Walker Administration it never had a chance to be done correctly and scientifically.

Look at all the potential vectors for contamination that the Waukesha Waste Water Treatment Plant does not clean up. This annotated bibliography from scientific journals points to some of

the questions that should have been asked about and were not. Where is the 21st century modeling and question asking that should have been done and was not? What should have been done and wasn't. I think many of the questions for a new and accurate EIS lay in this bibliography.

Why wasn't the School of Fresh Water sciences asked to participate in this instead of UW-Parkside that in no way has the brain power or special focus that the UW-M School of Freshwater Sciences has? It seems like the city of Waukesha avoids UW-M.

The attached document from the school of fresh water sciences I would like to include for the record.

"Trout enjoy water that contains methamphetamine" could this lead to them loitering around sewage pipes? British Broadcasting Service: London, U.K. July 18, 2021 <https://www.bbc.com/future/article/20210716-why-fish-are-becoming-addicted-to-illegal-drugs>

United Nations World Drug Report of 2021  
<https://www.unodc.org/unodc/en/data-and-analysis/wdr2021.html>

The Guardian: Manchester U.K. July 1, 2020 "Water firms discharged raw sewage into England's rivers 200,000 times in 2019"  
<https://www.theguardian.com/environment/2020/jul/01/water-firms-raw-sewage-england-rivers>

Journal of Experimental Biology: Czech Republic July 6, 2021  
"Methamphetamine pollution elicits addiction in wild fish"  
<https://journals.biologists.com/jeb/article-lookup/doi/10.1242/jeb.242145>

United Nations World Drug Report: New York, N.Y. 2015-17;  
[https://www.unodc.org/wdr2017/press/WDR17\\_Fact\\_sheet.pdf](https://www.unodc.org/wdr2017/press/WDR17_Fact_sheet.pdf)

Progress in Neurobiology: January 10, 2021 "Using zebrafish (Danio rerio) models to understand the critical role of social interactions in mental health and wellbeing"  
<https://www.sciencedirect.com/science/article/pii/S0301008221000071>

Aquatic Toxicology: June 14, 2014 Vol. 151; "Effects of chronic, parental pharmaceutical exposure on zebrafish (Danio rerio) offspring"  
<https://www.sciencedirect.com/science/article/abs/pii/S0166445X14000265>

Environmental International: August 2019 Vol. 129; "Biomonitoring of pesticides, pharmaceuticals and illicit drugs in a freshwater invertebrate to estimate toxic or effect pressure"  
<https://www.sciencedirect.com/science/article/pii/S0160412019307160>

Chemistry and Ecology: October 18 1993, Vol. 8 " Estrogenic Effects of Effluents from Sewage Treatment Works"  
<https://www.tandfonline.com/doi/abs/10.1080/02757549408038554>

Environmental Science & Technology: April 14, 2021, American Chemical



Society (C) 2021 "The Role of Behavioral Ecotoxicology in Environmental Protection" <https://pubs.acs.org/doi/10.1021/acs.est.0c06493>

Chemosphere: May 2017 Vol. 175, PP 401-410 "An evaluation of behavioural endpoints: The pharmaceutical pollutant fluoxetine decreases aggression across multiple contexts in round goby (Neogobius melanostomus)"

<https://www.sciencedirect.com/science/article/abs/pii/S0045653517302370?via%3Dihub>

Aquatic Toxicology: September 2010 Vol. 99 Issue 3, "Anti-depressants make amphipods see the light Author links open overlay panel"

<https://www.sciencedirect.com/science/article/abs/pii/S0166445X10002122>

National Library of Medicine, National Center for Biotechnology Information, National Institutes of Health: 2013 February; "Dilute concentrations of a psychiatric drug alter behavior of fish from natural populations"

<https://pubmed.ncbi.nlm.nih.gov/23413353/>

Nature: May 23, 2012 Vol. 485, 441 "The Hidden costs of flexible fertility", Abstract: "Urgent public debate is needed over a European proposal to regulate environmental levels of the active ingredient in birth-control pills, say Richard Owen and Susan Jobling." <https://www.nature.com/articles/485441a#citeas>

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This article originally appeared on The Conversation, and is republished under a Creative Commons licence. <https://theconversation.com/fish-hooked-on-meth-the-consequences-of-freshwater-pollution-163756>

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David Fulwiler  
Milwaukee, Wisconsin  
This email is digitally signed  
to ensure data integrity

"Things that are equal to the  
same thing are equal to each  
other" -Euclid's first axiom

Source: Todd Bragstad/Biz Journals

**Written by: Grace Barlow, Jose Basaldua, Leah Holloway and Angeline Koch**

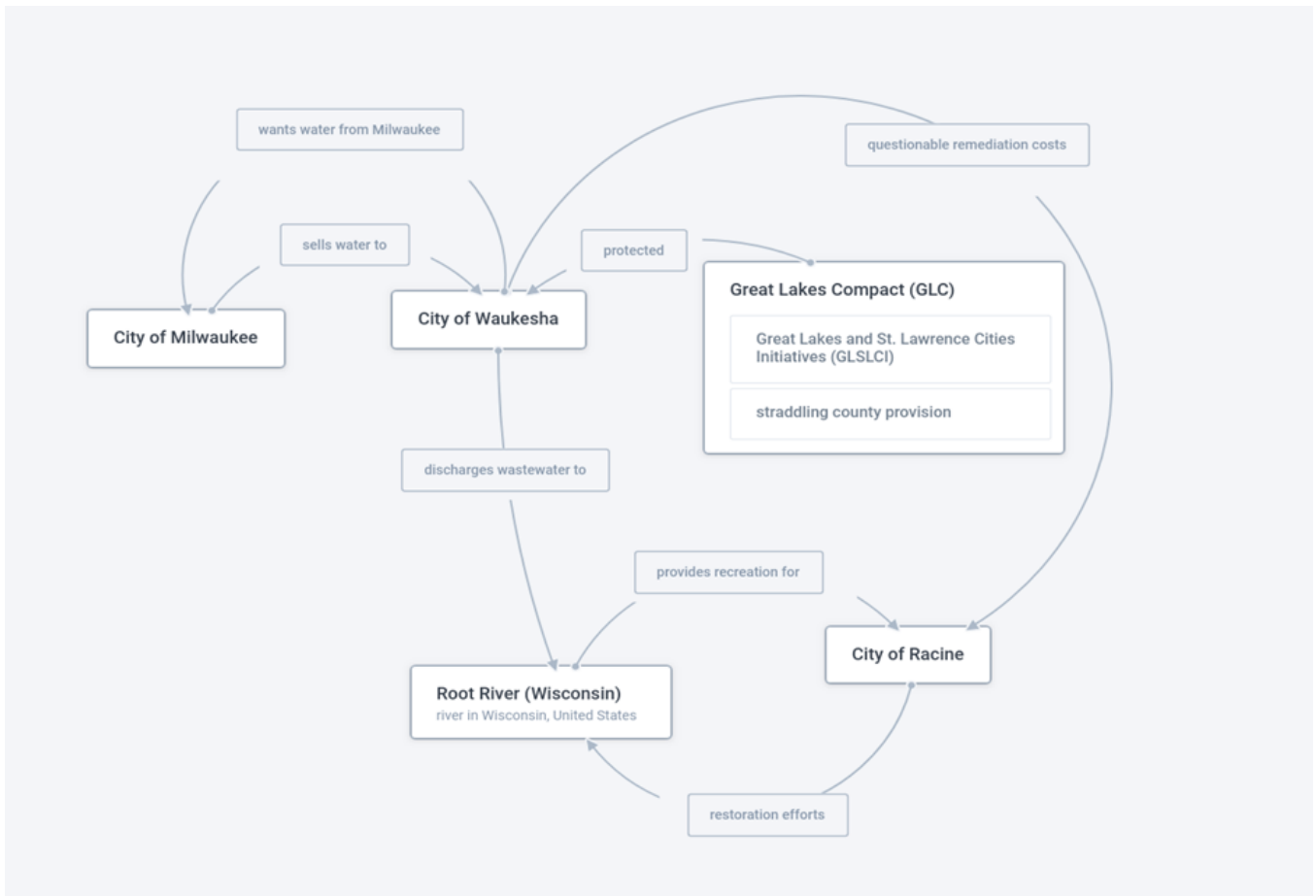
**Edited by: Eghosa Asemota**

The Great Lakes Compact, a legal contract between the states of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin, was created in conjunction with a similar legal agreement between the Canadian Provinces of Ontario and Quebec. This document, also referred to as the Compact, was signed into law in 2008 and outlines how states and provinces within the Great Lakes Basin will collectively manage the use of the Great Lakes' water supply. While the Compact has a wide range of goals, special emphasis is placed on ensuring that the Great Lakes' water remains within the natural basin boundaries and that it is used sustainably and responsibly.<sup>11</sup>

As the authors of the Compact carefully crafted this document over seven years, they kept watch over a particular situation developing in southeast Wisconsin. The drafters believed, with good reason, that the City of Waukesha would present the first major test of the Compact. They were right. The ink on the Compact was barely dry before Waukesha, which lies just outside the Lake Michigan Basin, submitted its application to the Wisconsin Department of Natural Resources (WDNR) for a diversion of Lake Michigan water. After an eight-year battle, Waukesha received approval for their request to divert Great Lakes water to its municipality. However, Waukesha's gain is not without negative impacts to other communities. Parties involved in the decision-making process gave little to no consideration to the environmental justice implications of the diversion, despite expending hundreds of thousands of dollars for environmental and legal analysis during an eight year application process. This paper will outline the driving reasons behind the current state of the Waukesha diversion plan and analyze the environmental justice concerns for communities in Southeastern Wisconsin. The analysis will utilize two frameworks, Systems Thinking and Schlosberg's Dimensions of Environmental Justice, and will focus particularly on the impacts of Waukesha's return flow plan through the Root River. This case study describes how Waukesha changed its plan to return its wastewater from a river that flows through a largely White, middle class community, to one that flows through a largely minority, lower income community, after protest from the middle class community. The case study also identifies intervention points where Waukesha could make changes to minimize the impact of the diversion on certain communities and be a positive model for how Great Lakes Compact diversions could be done equitably in the future.

## Dimensions and Systems Thinking

There are two frameworks for analyzing environmental justice issues: Systems Thinking and the Dimensions of Environmental Justice. These frameworks allow for a thorough examination of the environmental justice issues and provide methods to analyze potential intervention points and mitigate any injustices found. Systems Thinking, also referred to as DSRP, uses a holistic approach to ensure that all relevant pieces of a problem are considered. DSRP breaks problems down into four main components: distinctions, systems, relationships, and perspectives.<sup>[2]</sup> This framework helps users to address multifaceted problems by approaching the problem from different angle which allows for a more effective assessment of potential solutions and stakeholders. The *distinction* rule of DSRP states that “any ‘idea’ or ‘thing’ can be distinguished from other ‘ideas’ or ‘things’ within the system.” This is achieved by designating specific ideas as “identities.”<sup>[3]</sup> The *system* rule is defined as “any idea or thing that can be split into parts or lumped into a whole” and helps identify what aspects of a problem may be separated from the rest.<sup>[4]</sup> The relationship and perspective rules take both the identities and systems defined by the *distinction* and *system* rules and relate them to each other, other system components, and relevant perspectives. DSRP is a helpful tool for working through environmental justice issues, where unconscious biases and marginalization are often central to the problem. For this discussion of environmental injustices and the Waukesha Diversion, a DSRP map (Figure One) was created to aid the analysis.



**Figure 1: A DSRP/ Systems Thinking Map of the Waukesha Diversion Case**

The DSRP map illustrates the important distinctions and the systems they create for the Waukesha diversion case. The map also portrays the relationships between Waukesha and Milwaukee as a transaction. Waukesha will obtain Lake Michigan’s water from the City of Milwaukee but has yet to finalize a route for returning used or treated wastewater to Lake Michigan. Initially, engineering consultants determined that the return flow from Waukesha

to Lake Michigan should be routed via Underwood Creek. After the return flow plan was published to the community, Waukesha changed its return flow route from Underwood Creek to the Root River, which flows through the City of Racine. The Racine community enjoys a long standing commitment to the ecological health of the Root River which winds through their city. Residents recreate on the river, have businesses that are connected to the river, and are vested in the river's ecological health and integrity. These areas of interest will be expanded further in later sections of this discussion, including an analysis of Waukesha's commitments regarding the level of water quality of the discharge effluent and Waukesha's potential lack of accountability for environmental impacts.

The second framework for analyzing environmental justice issues, "The Dimensions of Environmental Justice," is derived from David Schlosberg's 2004 essay "Reconceiving Environmental Justice: Global Movements and Political Theories." Schlosberg expanded the idea of environmental justice that traditionally looked at whether pollution was distributed equitably among racial and economic demographics to include the ideas of recognition and participation. In his paper, Schlosberg argued that part of the problem of traditional environmental injustice theory is the lack of recognition of differences among communities based on race, ethnicity, or economic status.<sup>151</sup> An unacknowledged, marginalized community includes various forms of degradation and devaluation at both the individual and cultural level.<sup>152</sup> While it is important to recognize that environmental injustices are often centered around unequal distribution of pollution with marginalized groups bearing the brunt of pollution, uneven access to environmental resources, or environmental policy that focuses solely on addressing uneven distribution of pollution, is not adequate to restore justice. Instead, when looking to address and analyze issues of environmental justice, the decision-making process should recognize and prioritize the participation of marginalized groups.

Distributional justice observes the apportionment of environmental burdens and benefits throughout society. Unfortunately, many impoverished communities and communities of color in the U.S. are allotted a disproportionate share of society's environmental burdens. One burden shouldered disproportionately by impoverished communities is the disposal of wastewater into their local waterways. The release of untreated wastewater has the very serious potential of contaminating and poisoning the public and of destroying local ecosystems.<sup>153</sup> The situation can be made worse if an affected community relies heavily on local ecosystem services for sustenance and economic support. Not having a strong voice and not being allowed to participate in the decision-making process often results in distributive injustice. Communities of color and impoverished communities have lower property values as compared to middle-class communities with a White majority. As such, it costs less for industries to buy land in communities with depressed land value. In addition,

industries can set up operations with little to no opposition by residents who often have less access to information and are not often equipped to organize an opposition. In turn, these communities are exposed to a disproportionate amount of environmental pollution, including untreated wastewater. This situation was analyzed in a 2016 study in southern Texas that focused on the disproportional location of fracking wastewater disposal wells.<sup>[8]</sup> The study found that most wells were located in closer proximity to residents of color and living in poverty than near non-Hispanic White communities.<sup>[9]</sup>

The theory that recognition deepens the understanding and full impact of distributive injustice also establishes “the direct link between a lack of respect and recognition and a decline in a person’s membership and participation in the greater community, including the political and institutional order.”<sup>[10]</sup> The dimensions of an environmental justice analytical framework provides an in-depth analysis for the potential environmental justice concerns raised by the Waukesha diversion plan.

Before addressing Waukesha’s need for a Lake Michigan diversion and the analysis of environmental justice issues, it is important to understand the legal basis and policy of the Great Lakes Compact and related Wisconsin Department of Natural Resource statutes. The main legislative components of the Compact include a ban on future diversions and a requirement that each participating state or province develop a water management program based on elements required by the Compact.<sup>[11]</sup> The ban on future diversions provides that no community outside of the natural basin boundaries of the Great Lakes may move water out of the basin. However, because the political and the geological basin boundaries do not perfectly align, the Compact outlines two exceptions for communities that may apply for a diversion of the Great Lakes’ water. Communities whose political boundaries lie partly within the basin, such as New Berlin, Wisconsin, are referred to as “straddling communities.” Communities that are located in a county whose border lies partially on the basin line, such as Waukesha, Wisconsin, are referred to as “communities within straddling counties.” While both may apply for a diversion, the type of community plays a role in determining to which requirements a community must adhere. Both the Great Lakes Compact and the Wisconsin Department of Natural Resources outline requirements, summarized in Figure Two, for diversion approval. Requirements for communities within straddling counties, such as Waukesha, are more stringent.

**Straddling Community**

Per the Great Lakes Compact:

- Application must be from a public water supply system for public supply use.
- Community must put a water conservation plan into effect in order to maximize the amount of water returning to the basin.
- Community must return all water taken from the basin, save for consumptive use allowances, and minimize entrance of out of basin water.
- Wastewater will be treated to meet applicable permit requirements.

#### Community Within a Straddling County

- Must meet all above Great Lakes Compact requirements.
- Must prove that the community is without adequate water supply and that there is no adequate alternative for water supply.
- Must undergo formal technical review, regional review and approval, and receive approval from the Great Lakes Council to ensure that diversion will not have adverse ecological effects.

Per Wisconsin DNR Straddling County Requirements:

- Plans for use must be consistent with an approved water supply area service plan.
- Must meet wastewater return flow criteria: 1) water must be returned to the source watershed as close as practicable to where water is withdrawn, unless the applicant can demonstrate it is not economically feasible, environmentally sound, or not in the interest of public health, and 2) if water will be returned to the source watershed through a tributary, the biological, chemical, and physical, integrity of the water will be protected and sustained considering both low and high flow conditions.

#### Figure 2: Great Lakes Compact and Wisconsin Department of Natural Resource Requirements <sup>1121</sup>

The Great Lakes Compact and WDNR statutes are important components, vital to understanding the environmental justice issues surrounding the diversion. These requirements are the current framework for any community looking to access the Great Lakes' water, of which Waukesha is the first with a contentious application. The diversion requirements, whether they be from the Compact itself or from the WDNR, provide proponents and opponents of the diversion, the basis on which to argue the permissibility of Waukesha's request. This provides an interesting element to the discussion as both sides use the statutes and requirements to bolster arguments about the need to access safe drinking water, or their worry that the diversion will have negative ecological impacts on the Lake Michigan watershed and open the door for future diversions.

In particular, the WDNR requirement regarding the treatment and water quality standards of the return flow water- and the biological, chemical, and physical integrity of any waters



receiving this return flow water- is important to the Waukesha Diversion discussion. In the application, Waukesha stated that their withdrawal would not have negative environmental impacts on the biological, physical, and chemical integrity of the Root River, Lake Michigan, or other waters in the basin, and that their return flow “will be treated to meet applicable water quality standards” and “provide more, and higher-quality, functional in-stream habitat improvements to the biological integrity of the Great Lakes tributary receiving return flow.”<sup>(13)</sup> The City has maintained this position in subsequent documents throughout the diversion process, with this stance being a major point of contention between Waukesha and opposing voices.

### The Need for a New Source of Water in Waukesha

Another largely contested part of Waukesha’s application revolved around the Compact requirement for a community within a straddling county to demonstrate that it is “without adequate water supply and that there is no adequate alternative for water supply.”<sup>(14)</sup> Waukesha, Wisconsin is a suburb of Milwaukee that sits seventeen miles west of Lake Michigan, and one and a half miles outside of the Great Lakes Basin. Waukesha has a population of just over 72,000, making it the seventh largest municipality in the state.<sup>(15)</sup> It is seventy-eight percent White, twelve percent Hispanic, four percent Asian, four percent Black and two percent other.<sup>(16)</sup> Its median household income is \$59,500, which is slightly higher than Wisconsin as a whole, and Waukesha has an eleven percent poverty rate.<sup>(17)</sup>

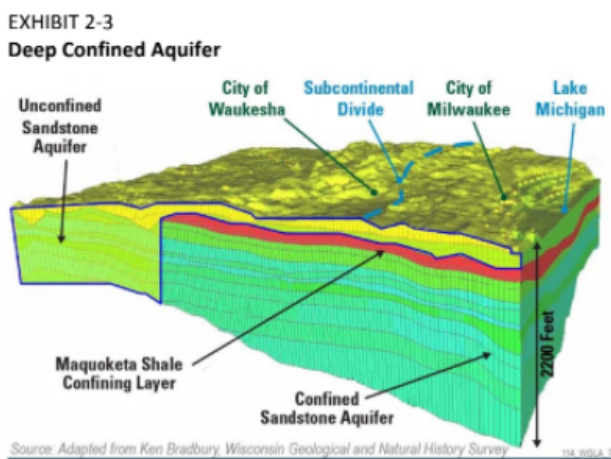


Figure 3: Geological Map of the Confined Aquifer

Currently, Waukesha uses seven deep wells in the St. Peter confined sandstone aquifer (Figure Three) that extend beneath Waukesha all the way east to Lake Michigan, and three



shallow wells in the Troy Bedrock Valley aquifer to the west, to obtain its public water supply.<sup>[18]</sup> Some of the deep wells are over seventy-five years old, and draw water from up to 1000 feet below the surface; the shallow wells are newer, most of which are less than twenty years old, and were put online to help mitigate Waukesha's increasing radium problem.<sup>[19]</sup>

As the population of the western Milwaukee suburbs began to grow, water withdrawals increased. Soon, more water was being drawn from the St. Peter Aquifer than could be replenished by annual precipitation, and water levels in the aquifer began to drop. Natural sources of radium became more concentrated the more the aquifer was drawn down, and this began to contaminate the region's drinking water supplies.<sup>[20]</sup> In 2000, the U.S. Environmental Protection Agency (EPA) announced more stringent radium regulations in order to protect citizens from this known carcinogen in their drinking water. Waukesha's water had more than three times the allowable standard.<sup>[21]</sup> Waukesha's initial response was to sue the EPA and discourage implementation of reduced radium restrictions.<sup>[22]</sup> When that failed, Waukesha decided to dig wells in the Troy Bedrock Valley to dilute the water supply enough to reduce radium concentration. While these wells helped reduce the levels of radium in drinking water supplies, Waukesha still does not consistently meet the standard for radium concentration in its public drinking water supply, especially during periods of high water use.<sup>[23]</sup> As such, Waukesha turned east toward Lake Michigan for relief.

Local environmental organizations hired the engineering firm GZA GeoEnvironmental to look at alternatives to a Lake Michigan diversion, including solutions neighboring communities employed to mitigate radium contaminated drinking water. GZA took into account not only Waukesha's trouble with radium, but also their concern that it did not have enough water capacity in their existing wells to meet the current and future needs of citizens and industry.<sup>[24]</sup> One solution that GZA analyzed was a treatment system called "Water Remediation Technology (WRT) Z-88." Neighboring Wisconsin cities of Brookfield and Pewaukee, as well as six municipalities in Illinois and six additional American cities, use WRT.<sup>[25]</sup> GZA opines that this system, in addition to digging two new wells to replace ones that Waukesha has already or plans to shut down soon, can solve all of Waukesha's water supply challenges for half the cost of diverting water from Lake Michigan. The current estimated cost of a diversion is \$334 million.<sup>[26]</sup> Waukesha did not consider including different treatment alternatives, such as WRT, as part of the alternative options in its application for diversion. Instead, each of the options was a different source of water or combination of sources.<sup>[27]</sup>

After more than a decade, Waukesha approaches a quickly looming EPA 2018 deadline to bring its public water supply system into year-round compliance. Now that its application

for a diversion from the Great Lakes has been approved, Waukesha is able to move forward with its preferred solution of a diversion. In accordance with the rules set forth by the Compact, Waukesha must return the water it borrows to Lake Michigan. The route they have chosen for this return flow is the Root River, which is where our environmental justice analysis is focused.

### **Environmental Justice Considerations of Waukesha’s Return Flow Plan via the Root River**

The Root River flows southeast from New Berlin through the community of Racine before flowing into Lake Michigan. While treated wastewater discharging into a river can present challenges to any community through which the river flows, there are several features of the community of Racine and the Root River Basin that make Waukesha’s decision to return its wastewater via the Root River, as opposed to Underwood Creek, uniquely concerning from an environmental justice standpoint.

In 2016, the Great Lakes - St. Lawrence River Basin Water Resources Compact Council (“Compact Council”) granted a diversion of water from Lake Michigan to the City of Waukesha despite strenuous objections based on social and environmental justice grounds advanced by the ACLU of Wisconsin, the Sierra Club, the Milwaukee Inner City Congregations Allied for Hope, and the NAACP-Milwaukee Branch. These organizations argued that granting a diversion would contribute to Waukesha’s unchecked suburban sprawl to the detriment of communities of color residing in the City of Milwaukee who historically have lacked access to jobs and housing in Waukesha. The State of Wisconsin and the Wisconsin Department of Natural Resources endorsed the diversion application. Shortly after the Compact Council granted the diversion, the Great Lakes and St. Lawrence Cities Initiative (“Cities Initiative”) filed a petition asking the Compact Council to review the decision. In support of the review request, the Cities Initiative offered several reasons why the diversion should not have been granted or, in the alternative, should be modified. However, none of these reasons touched on environmental justice considerations. After reviewing briefs by the Cities Initiative and the City of Waukesha, and hearing oral arguments, the Compact Council unanimously denied the Cities Initiative’s request to reopen or modify the decision to grant the diversion.

While these environmental justice objections are not insignificant to a broader analysis of whether a diversion should be granted, because the Compact Council granted the diversion, the next most pressing environmental justice consideration surrounds the selection of the river through which Waukesha’s treated wastewater effluent will be returned to Lake

Michigan, i.e., its “return flow plan.” As stated above, the current plan provides that Waukesha’s treated wastewater will be returned to Lake Michigan via the Root River, which flows through the City of Racine, and not through the City of Wauwatosa via the Underwood Creek, as initially proposed. The communities of Wauwatosa and Racine are very different, such that an analysis of the decision to route the return flow through Racine, through the dimensions of environmental justice, is appropriate. The return of Waukesha’s treated wastewater via either river imposes significant environmental and economic risks to the surrounding community.

In May 2010, Waukesha initially committed to return 100 percent of Lake Michigan water (minus consumptive use) to Lake Michigan via Underwood Creek, which flows into the Menomonee River through the City of Wauwatosa near West Bluemound Road. However, after strenuous objections by the City of Wauwatosa, Waukesha amended its application and requested that its effluent be discharged back to Lake Michigan via the Root River. The effluent will be treated at the City of Waukesha sewerage treatment plant prior to discharge into the Root River. The proposed discharge point along the Root River is planned for at S. 60th St. in Franklin. Water treatment will include removal of chemical phosphorus, chloride, suspended solids, and organic materials; tertiary filtration; and ultraviolet light disinfection. The proposed phosphorus limits are below the water quality standard for the Root River. The City of Waukesha will be returning up to ten million gallons of treated effluent per day into the Root River. Based on prior review of Waukesha’s plan by the Wisconsin Department of Natural Resources and the Compact Council, the proposed quality of wastewater returned via the Root River by Waukesha will meet federal and state requirements.

In denying the Cities Initiative petition for review, the Compact Council concluded that the Cities Initiative failed to detail how the return flow, which must comply with federal and state water quality standards, would result in significant impacts on the basin, which is the standard of review required in the Compact. The Council’s conclusion seemingly ignores the scientists at UWM School of Freshwater Science and the City of Racine Dept. of Public Health, who have opined that there will be adverse environmental impacts on the Root River. While there are meaningful concerns about water quantity impacts to the Root River (flooding, erosion, sediment mixing), the most significant issue presented by the return flow plan relates to water quality. Specifically, the concentration of pathogens, pharmaceuticals, and other emerging contaminants that are not currently regulated and not treated via sewerage treatment facilities, will have a negative impact on the Root River. In addition, there are valid concerns about Waukesha’s ability to meet the proposed phosphorus and chloride standards, and Waukesha’s lack of financial liability for any negative impact for its failure to do so.

The WDNR identified elevated phosphorus and chloride levels in their Environmental Impact Statement and Technical Review of Waukesha's diversion plan.<sup>[28]</sup> According to federal and state standards, discharge into the Root River cannot exceed a phosphorous standard of 0.075 mg/L or a chloride limit of 400 mg/L. Waukesha's discharge will be permitted (through the Wisconsin Pollutant Discharge Elimination System) and required to meet these standards. However, reports compiled by the WDNR provide that Waukesha cannot meet the recommended chloride limit of 400 mg/L. In addition, consultants for Waukesha stated that Waukesha will not be able to meet the phosphorus standards consistently.<sup>[29]</sup> Excess phosphorus is a concern because it can speed up the process of eutrophication in a body of water, which in turn decreases ecosystem productivity. The inability to meet phosphorus standards consistently presents a significant challenge for downstream communities like the City of Racine. Furthermore, the Root River is already listed on Wisconsin's Impaired Waters list as the upper sections of the river (the Root River canal and the West Branch of the canal) currently have excessive phosphorus levels, decreasing dissolved oxygen levels below what is necessary to support aquatic life.<sup>[30]</sup> Additional phosphorus inputs into the ecosystem will only exacerbate eutrophic conditions and increase the difficulty of implementing a remediation plan or Total Maximum Daily Load (TMDL) for the waterway.

In addition to increased nutrient and chloride levels within the Root River, Waukesha's discharge increases the likelihood of additional pathogens being introduced to the river. While Waukesha's return flow will meet state wastewater treatment effluent standards, there is still the potential for pathogens to persist beyond the wastewater treatment process. Wisconsin wastewater effluent standards are partially regulated using total coliform counts and fecal coliform counts, known as bacterial indicators.<sup>[31]</sup> Bacterial indicators are conventional for wastewater treatment standards, however, research over the past several decades has demonstrated that these indicators do not adequately reflect the pathogenic contamination of wastewater.<sup>[32]</sup> Total coliform and fecal coliform counts do not indicate the presence of other categories of pathogens that do not stem from fecal contamination. Further, pathogenic contamination does not always follow a proportional relationship to the level of indicator bacteria present in the water.<sup>[33]</sup> Pathogenic concentrations have the potential to be high in wastewater, despite meeting effluent fecal and total coliform standards, as pathogens can persist beyond the reduction and inactivation methods used in treatment centers. This presents an environmental and public health risk as surface water containing wastewater discharge may pass the bacterial indicator standard, yet still contain harmful pathogens.

## Concerns Remain after Granting Waukesha’s Application for Diversion

Contrary to Waukesha’s contention and the opinion of the Compact Council, there are several significant concerns with Waukesha’s return flow plan. First, while the City of Waukesha contends that the return flow will benefit the Root River by adding volume during times of low flow, Waukesha fails to acknowledge that during times of low flow, seventy five to ninety percent of the water in the Root River will be “treated” wastewater effluent: effluent which has not been treated for residual pathogens, microplastics, pharmaceuticals or other emerging contaminants.<sup>[24]</sup> This increased level of contamination will pose human health risks as well as risks to the riparian ecosystem. Waukesha also contends that the increase in flow to the Root River will improve Great Lakes fisheries. Waukesha, however, fails to appreciate the presence of unregulated contaminants in the return flow that will cause harm to fish and other organisms, including the people that recreate in and around the Root River.

Second, Dr. Sandra McLellan, a research professor at the UWM School of Freshwater Science specializing in environmental health, argues that the Waukesha effluent will contain increased amounts of contaminants and nutrients: an increase in phosphorus loading, higher concentrations of chloride, higher concentrations of total suspended solids, pharmaceuticals, higher concentrations of residual pathogens, and other emerging contaminants like microplastics and personal care products.<sup>[35]</sup> The quantity of these contaminants, Dr. McLellan stated, will have a profound impact on the quality of water in the Root River (and the near shore area of Lake Michigan) on which people regularly kayak, boat, and fish. In addition to impacts on human health, it is believed that many of these contaminants will have a negative impact on the health of the aquatic ecosystem. For instance, scientists at the School of Freshwater Science, including Dr. Rebecca Klaper, are studying the impact the diabetes drug, metformin, is having on fish in Lake Michigan. Other studies are documenting the impact microplastics and microfibers are having on fish and other wildlife that consume these micro-contaminants. Neither the City of Waukesha nor the Compact Council meaningfully addressed concerns about emerging contaminants.

Another significant concern is whether Waukesha, after it sets high phosphorus and chloride standards in the WPDES permit in order to secure approval, will subsequently seek a variance arguing that it is not technically feasible to meet the limits in the permit. Nothing in the Compact Council’s decision prohibits Waukesha from seeking such a variance. Therefore, Waukesha’s unwillingness to recognize the concerns of the community through which it intends to send its wastewater effluent, will be compounded by further reducing the quality of the effluent with a subsequent variance.

In addition, there is no requirement that Waukesha monitor the Root River, pre- or post-diversion, for the emerging contaminants as previously outlined. Waukesha's Water Utility contracted with the University of Wisconsin-Parkside to begin monitoring the Root River's water quality and biological conditions, including fish health. However, the monitoring excludes analysis for emerging contaminants, e.g., residual pathogens, microplastics or any pharmaceuticals. Likewise, the post diversion monitoring required by the Compact Council (set for a minimum of ten years) does not include emerging contaminants. Therefore, key components for assessing the water quality of the Root River will not be monitored. As outlined by Dr. McLellan, monitoring only for certain contaminants, such as E. coli and phosphorus but not residual pathogens, does not provide an accurate or comprehensive assessment of water quality.<sup>1320</sup>

Furthermore, without accurate data, it will be difficult to assess whether the City of Waukesha's return flow has a negative impact, significant or otherwise, on the Root River. The Compact Council did give passing reference to the concern about emerging contaminants by pointing out that it did require the City of Waukesha to develop a comprehensive pharmaceutical and personal care products recycling program, to reduce the quantity of these products entering the City of Waukesha's wastewater, but the Council stopped short of requiring the City of Waukesha to monitor for contaminants not otherwise required to be monitored by federal or state law. Lastly, Waukesha is not required by the Compact Council to pay for any negative local, regional, or cumulative impact caused by its return flow. If the return flow does have a negative impact on human health, fisheries, or aquatic life, there is no provision in Waukesha's plan to pay for the damage, leaving the City of Racine to bear the economic burden.

In light of the considerations outlined above, it is clear why the City of Wauwatosa vigorously objected to Waukesha's initial plan to discharge its treated sewage via Underwood Creek (Figure Four). Clearly, the community of Wauwatosa understood that Waukesha's plan to distribute its wastewater effluent was not as simple or "clean" as alleged by Waukesha in its return flow plan. What is unclear is what motivated Waukesha to amend its diversion plan, to request that its treated wastewater be discharged through the community of Racine via the Root River instead of through Wauwatosa via Underwood Creek, especially since it costs less and crosses fewer streams than discharging to the Root River. According to Waukesha's 2010 application, the return flow through Underwood Creek had the lowest estimated capital cost of \$56M with an annual operations and maintenance cost of about \$120,000, as compared to the estimated costs for return flow via the Root River which were about \$76M with an annual operating and maintenance cost of \$145,000.<sup>1321</sup>



Return Flow Alignment to Root River (river shown only downstream of the return flow)

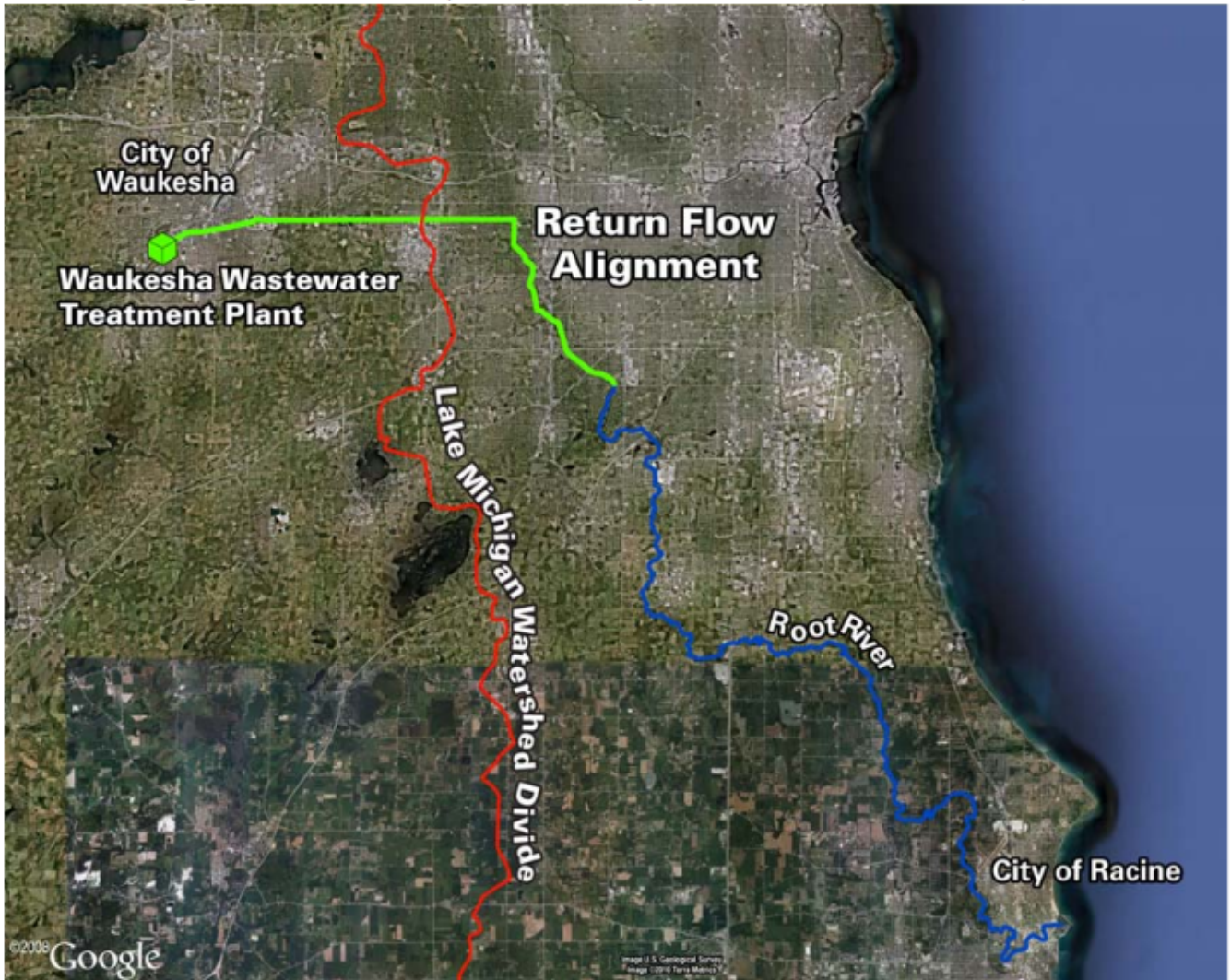




Figure 4: Maps Showing Return Flow Paths Through Underwood Creek and the Root River

## A Tale of Two Communities

As mentioned above, the demographics of Racine and Wauwatosa are distinct. According to the latest demographic information from July 2016, the overwhelming majority of Wauwatosa residents are employed (seventy-one percent) and enjoy a median household income of \$70,000 with a median property value of \$220,000.<sup>[38]</sup> By contrast, the median value of a home in Racine is \$110,000, the median household income is \$41,000, and sixty-four percent are employed with twenty-two percent living in poverty, as seen in Figure Five.<sup>[39]</sup>

2016	Wauwatosa	Racine
Population:	47,000	77,000
High School Graduates	97%	82%
Bachelor's Degree or Higher:	60%	18%
Employed:	71%	64%
Median Household Income:	\$70,000	\$41,000
Persons in Poverty:	6.30%	22%
Median Property Value:	\$220,000	\$110,000
Home Ownership:	63%	52%
Caucasian:	87%	52%



**Figure 5: Wauwatosa and Racine Census Information Comparison (United States Census Bureau, 2017)**

The last few miles of the Root River through the City of Racine includes popular fishing spots and an area that the City plans to revitalize. The City is working with developers on a sixty-five million dollar plan to redevelop an aged steam engine plant along the Root River waterfront as a mixed-use building with apartments and retail shops. In addition, the City spent the last fifteen years cleaning up North Beach. Racine officials and residents voiced concerns about the viability of these projects and the continued clean-up of North Beach to Waukesha’s planners, only to have them be rebuffed. The City of Waukesha rejects any concern by saying that the treated wastewater will be clean and that it will comply with all Federal and State laws. However as outlined above, the Federal and State standards do not adequately address issues of water quality like viruses and pharmaceuticals. In summary, Waukesha went from sending its treated wastewater through a middle class, predominantly White community, to discharging its treated effluent through an economically depressed community with a much higher population of minority residents.

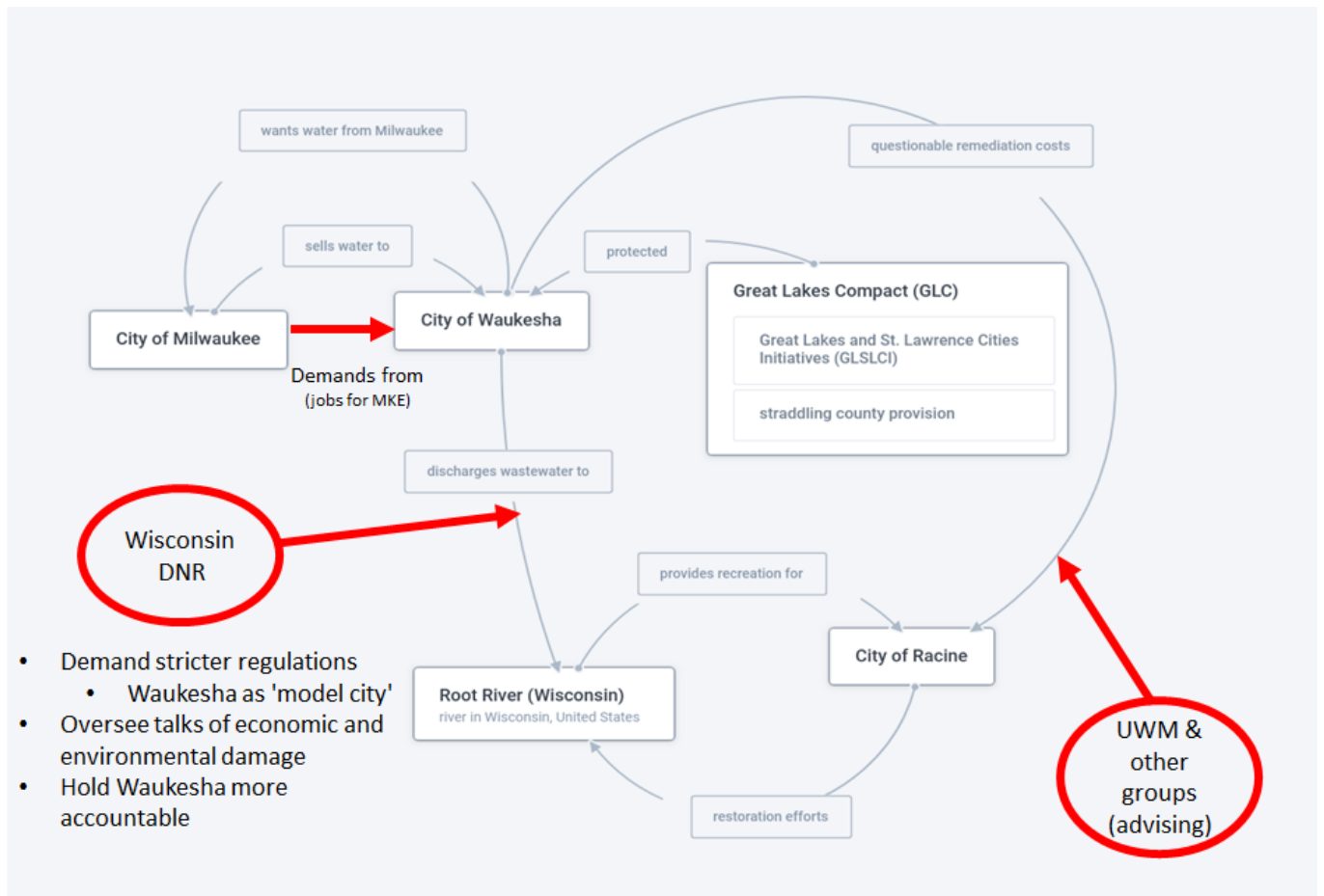
### **Waukesha Planners Failed to Recognize the Concerns of the Community of Racine When Selecting a Route**

Waukesha’s decision to change return flow routes after the citizens of Wauwatosa objected, failed to recognize and value the concerns of the citizens of Racine to the same degree that it did the citizens of Wauwatosa. Waukesha fails to recognize the concerns of Racine in repeating the pat response that the return flow effluent will be in compliance with state and federal laws, ignoring their concerns about other contaminants and potential negative economic impact. The City of Waukesha maintains a website dedicated to its diversion plan but the website does not include any information about the environmental justice implications of its return flow plan on Racine.<sup>(40)</sup> While there is a section about “myth” and “facts,” none of the sections include a response to Racine’s concern that its citizens will be fishing and swimming in Waukesha’s wastewater. In addition to a lack of recognition, the citizens of Racine have not been provided the opportunity to participate meaningfully in the process of selecting a return flow route.

Over the past several years that Waukesha planned its diversion and return flow routes, Waukesha and the WDNR held only one meeting in Racine. It is possible that the City of Racine officials held meetings and that possibly some residents of Racine travelled to a meeting outside Racine or submitted an online comment, however, the fact remains that Racine residents have not been afforded the chance to participate meaningfully in the planning process. On March 23, 2018, the Waukesha Water Utility submitted to the WDNR

its 3-140 D2 Waukesha Great Lakes Water Supply Program WDNR Supplemental Environmental Impact Report-Redacted (SEIR). According to the SEIR, the WDNR conducted several meetings with affected communities, including two sets of public hearings and two public comment periods prior to submitting the Lake Michigan Diversion Application to the Compact Council in January 2016. The WDNR held three public “scoping” meetings on July 26, 27, and 28, 2011, in Pewaukee, Wauwatosa, and Sturtevant. The WDNR prepared a draft Environmental Impact Statement and invited the public to comment on it between June 25 and August 28, 2015. Comments were also received at three public hearings on August 17 and 18, 2015, in Waukesha, Milwaukee, and Racine. Meaningful efforts at recognition and participation would include holding more meetings with the residents of Racine to discuss their concerns, allowing a representative from Racine to participate in the decision-making process, and being amenable to offering solutions to Racine’s concerns about water quality and economic impacts. Waukesha would like people to empathize and support their quest for a sustainable source of drinking water but seem reluctant to recognize and validate the concerns of other communities affected by that quest.

Waukesha has the opportunity to improve its image and its return flow plan by addressing the environmental justice implications its plans have on the Racine community. Figure Six shows some potential points of interjection in the DSRP map created for this analysis. The WDNR can collaborate with Waukesha, Milwaukee, and Racine, and facilitate discussions about potential economic and environmental impacts from the diversion. The discussions can then be used by the WDNR to create stronger regulations that should not be a problem for Waukesha adherence. Further discussions will make Waukesha a stronger participant in monitoring the Root River as regulations are adapted to the new terms. Additional groups, such as the UWM School of Freshwater Science and the City of Racine Dept. of Public Health, will be included as consultants in creating new regulations, establishing a collaborative monitoring and remediation program, and experimenting with filtration methods. One concern over the treated wastewater is the additional input of emerging contaminants and residual pathogens. Waukesha can fix this concern by becoming a test candidate for new filtration technologies created to filter emerging contaminants. New regulations and standards can strongly motivate the research and development of new filtering methods. In addition, Waukesha should consider setting up a fund to help Racine pay for the damages likely to be caused by flooding and erosion resulting from the increased flow rate in the Root River. By taking these steps, Waukesha could become a model city for requesting and accomplishing the first major diversion that challenged the Great Lakes Compact, the very document created to prevent transfers outside of the basin.



**Figure 6: DSRP/Systems Thinking Map with Potential Interjection Points**

It can be presumed that the Waukesha diversion is the first of many subsequent diversion proposals to be pursued within the Great Lakes Basin. To begin considering any future diversions similar to Waukesha, the current diversion case needs to set strict standards and regulations to follow in order to prevent any environmental injustice and economic impact. Of course, this is dependent on the success a new application has in getting approved to move forward with a proposal. Such decisions can benefit immensely by the inclusion of local residents, private entities, and government authorities, in deciding the fate of a new application. A pragmatic approach to these decisions can provide economic prosperity without the loss of environmental benefits or public safety. The Waukesha diversion will need a workforce for its construction, and big projects like this one can generate needed jobs. Milwaukee is currently in a position of requesting jobs for its residents, for construction of the infrastructure. The employment can be extended by establishing maintenance and monitoring protocols. Similar opportunities can be created in potential future diversion projects should they be considered.

## Conclusion

As outlined above, there is no question that Waukesha’s plan to return its wastewater to Lake Michigan via the Root River will introduce unregulated contaminants to the river and lake which will cause harm to those ecosystems and people who rely on them for drinking water, sustenance fishing, and recreation. It can be argued that Waukesha’s plan to return the water used by its majority White, affluent residents, via a river that flows through a predominantly non-White, working class town, unfairly distributes health and economic risks to the City of Racine. In response, Waukesha’s statement that its wastewater discharge will meet federal regulations rings hollow. In addition, Racine residents may lose access to the river, and local businesses dependent on the river may see a drop in customers and profit.<sup>44</sup> These are all potential burdens suffered by Racine without any attendant benefits. The burden imposed on Racine residents will not be shared by the residents of Waukesha, as there is no requirement by the Compact Agreement or the WDNR approval that the City of Waukesha pay for any economic or ecological damage caused by the return flow. While Waukesha has already gained the permission it needs to divert water from the Great Lakes Basin, the plan to return the water via the Root River has not been finalized. In light of these serious concerns regarding the injustices imposed on the Racine community, it is recommend that Waukesha either select a different return flow route, or make a financial commitment to assist Racine in mitigating and/or remediating any damage caused by flooding or erosion. At a minimum, the WDNR should require the City of Waukesha to devise a plan that reduces the amount of contaminants sent to the water treatment facility, and require the sewage treatment facility to improve wastewater treatment and testing systems to reduce the amount of microplastics, pharmaceuticals, and other unregulated contaminants being discharged to the Root River.

## References

1. Great Lakes- St. Lawrence River Basin Water Resources Council, “Great Lakes-St. Lawrence River Basin Water Resources Compact,” December 2005, 1 - 27. [↑](#)
2. Derek Cabrera and Laura Cabrera, “New Hope for Wicked Problems,” in *Systems Thinking Made Simple: New Hope for Solving Wicked Problems*, (USA: Plectica Publishing, 2015), 12-20. [↑](#)
3. Derek Cabrera and Laura Cabrera, “New Hope for Wicked Problems,” in *Systems Thinking Made Simple: New Hope for Solving Wicked Problems*, (USA: Plectica Publishing, 2015), 12-20. [↑](#)
4. Derek Cabrera and Laura Cabrera, “New Hope for Wicked Problems,” in *Systems Thinking Made Simple: New Hope for Solving Wicked Problems*, (USA: Plectica

- Publishing, 2015), 12-20. [↑](#)
5. David Schlosberg, "Reconceiving Environmental Justice: Global Movements and Political Theories," *Environmental Politics* 13, no. 3. (2004): 517- 540. [↑](#)
  6. David Schlosberg, "Reconceiving Environmental Justice: Global Movements and Political Theories," *Environmental Politics* 13, no. 3. (2004): 517- 540. [↑](#)
  7. Dalia Saad, Deirdre Byrne, and Pay Drechsel, "Social Perspectives on the Effective Management of Wastewater," *Physico-Chemical Wastewater Treatment and Resource Recovery*. (April 2016): 253- 262. [↑](#)
  8. Jill E. Johnson, Emily Werder, and Daniel Sebastian, "Wastewater Disposal Wells, Fracking and Environmental Injustice in Sourthern Texas," *American Journal of Public Health* 106, no. 3. (March 2016): 550-556. [↑](#)
  9. Jill E. Johnson, Emily Werder, and Daniel Sebastian, "Wastewater Disposal Wells, Fracking and Environmental Injustice in Sourthern Texas," *American Journal of Public Health* 106, no. 3. (March 2016): 550-556. [↑](#)
  10. David Schlosberg, "Reconceiving Environmental Justice: Global Movements and Political Theories," *Environmental Politics* 13, no. 3. (2004): 517- 540. [↑](#)
  11. Wisconsin Department of Natural Resources, "Great Lakes Compact Background," 2018. [↑](#)
  12. Wisconsin Department of Natural Resources, "Great Lakes Compact Background," 2018. [↑](#)
  13. Ch2mHill, "Application Summary: City of Waukesha Application for a Lake Michigan Diversion with Return Flow," October 2013, Volume 1: 1.1 - 5.1. [↑](#)
  14. Great Lakes- St. Lawrence River Basin Water Resources Council, "Great Lakes-St. Lawrence River Basin Water Resources Compact," December 2005, 1 - 27. [↑](#)
  15. United States Census Bureau, "Quick Facts," July 2017. Ch2mHill, "Application Summary: City of Waukesha Application for a Lake Michigan Diversion with Return Flow," October 2013, Volume 1: 1.1 - 5.1. [↑](#)
  16. United States Census Bureau, "Quick Facts," July 2017. [↑](#)
  17. United States Census Bureau, "Quick Facts," July 2017. [↑](#)
  18. Ch2mHill, "Application Summary: City of Waukesha Application for a Lake Michigan Diversion with Return Flow," October 2013, Volume 1: 1.1 - 5.1. [↑](#)
  19. Ch2mHill, "Application Summary: City of Waukesha Application for a Lake Michigan Diversion with Return Flow," October 2013, Volume 1: 1.1 - 5.1. [↑](#)
  20. Ben Merriman, "Testing the Great Lakes Compact: Administrative Politics and the Challenge of Environmental Adaptation," *Politics and Society*, 45 no. 3. (June 2017): 441- 466. [↑](#)
  21. Ch2mHill, "Application Summary: City of Waukesha Application for a Lake Michigan Diversion with Return Flow," October 2013, Volume 1: 1.1 - 5.1. [↑](#)

22. Ben Merriman, "Testing the Great Lakes Compact: Administrative Politics and the Challenge of Environmental Adaptation," *Politics and Society*, 45 no. 3. (June 2017): 441- 466. [↑](#)
23. Ch2mHill, "Application Summary: City of Waukesha Application for a Lake Michigan Diversion with Return Flow," October 2013, Volume 1: 1.1 - 5.1. [↑](#)
24. GZA GeoEnvironmental Inc, "Response to Comments on Non-Diversion Alternative," February 2016, 2-11. [↑](#)
25. GZA GeoEnvironmental Inc, "Response to Comments on Non-Diversion Alternative," February 2016, 2-11. [↑](#)
26. GZA GeoEnvironmental Inc, "Response to Comments on Non-Diversion Alternative," February 2016, 2-11. [↑](#)
27. Ch2mHill, "Application Summary: City of Waukesha Application for a Lake Michigan Diversion with Return Flow," October 2013, Volume 1: 1.1 - 5.1. [↑](#)
28. Great Lakes and St. Lawrence Cities Initiative, "Great Lakes and St. Lawrence Cities Initiative Reply to City of Waukesha's Response to The Cities Initiative Request for a Hearing," February 2017, 1-34. [↑](#)
29. Great Lakes and St. Lawrence Cities Initiative, "Great Lakes and St. Lawrence Cities Initiative Reply to City of Waukesha's Response to The Cities Initiative Request for a Hearing," February 2017, 1-34. [↑](#)
30. Wisconsin Department of Natural Resources, "303(d) Impaired Waters List," 2018. [↑](#)
31. Wisconsin Department of Natural Resources, "Wastewater Regulations," 2018. [↑](#)
32. Valerie J. Harwood, Christopher Staley, Brian D. Badgley, Kim Borges, and Asja Korajkic, "Microbial source tracking markers for detection of fecal contamination in environmental waters: relationships between pathogens and human health outcomes," *FEMS Microbiology Reviews* 38, no 1. (January 2014): 1- 40. [↑](#)
33. Valerie J. Harwood, Christopher Staley, Brian D. Badgley, Kim Borges, and Asja Korajkic, "Microbial source tracking markers for detection of fecal contamination in environmental waters: relationships between pathogens and human health outcomes," *FEMS Microbiology Reviews* 38, no 1. (January 2014): 1- 40. [↑](#)
34. Sandra McLellan, "Microbial Indicators" (class lecture, Water Law for Scientists and Policy Makers, UW-Milwaukee School of Freshwater Sciences, Milwaukee, Wisconsin, October 25, 2017). [↑](#)
35. Sandra McLellan, "Microbial Indicators" (class lecture, Water Law for Scientists and Policy Makers, UW-Milwaukee School of Freshwater Sciences, Milwaukee, Wisconsin, October 25, 2017). [↑](#)
36. Sandra McLellan, "Microbial Indicators" (class lecture, Water Law for Scientists and Policy Makers, UW-Milwaukee School of Freshwater Sciences, Milwaukee, Wisconsin, October 25, 2017). [↑](#)



37. Ch2mHill, "Application Summary: City of Waukesha Application for a Lake Michigan Diversion with Return Flow," October 2013, Volume 1: 1.1 - 5.1. [↑](#)
38. United States Census Bureau, "Quick Facts," July 2017. [↑](#)
39. United States Census Bureau, "Quick Facts," July 2017. [↑](#)
40. Waukesha Water Utility, "Myths and Facts about Waukesha's New Water Supply Program," 2016. [↑](#)
  
41. Wasim Ahmad and Marwan Ghanem, "Enhancing of Socio-economical Environmental Impact of the Wastewater Flow on Communal Level," *International Journal of Research In Social Sciences* 6, no. 2 (January 2016): 46- 52. [↑](#)



## **Grace Barlow, Jose Basaldua, Leah Holloway and Angeline Koch**

The authors of this paper are all masters students within the School of Freshwater Science at the University of Wisconsin-Milwaukee. This article was prepared for a class focusing on Environmental Justice and the use of Systems Thinking to solve multifaceted problems.

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**From:** [Lucia Petrie](#)  
**To:** [DNR Compact Program Review](#)  
**Subject:** Compact  
**Date:** Tuesday, October 08, 2024 11:31:08 AM

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The Great Lakes Compact is a comprehensive agreement to insure water remains in the Great Lakes. It is essential that no additional exceptions are made. In fact, I submit that communities that are current exceptions to the Compact must submit annual plans for water conservation. And I believe that a cap must be placed on these diversions so that no additional water is diverted.



**From:** [cheryl\\_nenn@milwaukeekeeper.org](mailto:cheryl_nenn@milwaukeekeeper.org)  
**To:** [DNR Compact Program Review](#)  
**Subject:** MRK Comments on Water Management and Water Conservation and Efficiency Program Review  
**Date:** Friday, November 15, 2024 6:13:06 PM

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Hi Shaili—

I have a few quick comments and questions on the Water Management and Water Conservation and Efficiency Program Review document, which is open for comment through today.

Per the Compact, the DNR requires permits for water use greater than 100,000 MGD or 1,000,000 MGD, and regional approval is required over 10 Million MGD. But I noted that for water loss approvals from surface waters, that permits aren't required until water loss averages more than 2 million gallons per day statewide. That seems concerning to me, as I would think impacts on inland creeks/lakes would be more significant than impacts on the Great Lakes, and it also just sends a conflicting message or may incentivize a utility or company to seek water from a river versus the lake, because they wouldn't need a permit. Does that make sense?

On page 9, when stating conditions for an inter-basin transfer, would impacts on water levels of streams be looked at (as ecosystem impacts)? Because only lake levels are mentioned—presumably for the Great Lakes.

I was also not aware of the condition (on page 14 of PDF) that states that the “state decision-making standard” would be applied instead of the “Compact decision-making standard”, where normally the latter would apply, if the entity applying shows that water loss would average less than 5 MGD over a 90 day period, versus averaging 10 MGD in a 30 day period. How many entities are in this bucket so to speak? And are other states managing these types of water uses in the same way? I understand the distinction but I'm not sure if that is a decision that WI should make in isolation because it is different than the Compact language.

On page 15, under the definitions of “reasonable use” for diversions, I find the bullets under “considerations” confusing as written b/c some are seeming written in the permissive and others in the restrictive tense. I think it would be clearer if written in a “thou shall not” type of frame. The second bullet is weirdly written in particular, like it's a reasonable use if “the proposal would result in an increased water loss”.

On page 16, under the exception standard for diversions section, I am opposed to number 1 language that states: “The proposal for a diversion must be consistent with an approved water supply service area plan under s. 281.348, Wis. Stat., that covers the public water supply system, unless the proposal is to provide water to a straddling community that includes a designated

electronics and information technology manufacturing zone. § 281.346(4)(c)2m. and (e)1.em., Wis. Stat.” That clearly was put in place for the sole purpose of allowing a water diversion for Foxconn, and I don’t see any distinction of why the electronics or information technology users should get special consideration. We do contend as well that when a diversion is granted, and conditions substantially change (who is using the water, and to what end, as well as socioeconomic considerations like jobs created), that the Department should have a way to reexamine a water diversion approval, and that these permits should not be permanent or evergreen to ensure that permittees don’t pull a “bait and switch.”

On page 16, under the third exception, I bristle at the part that states “considering the state of the receiving water before” in this paragraph:

“the physical, chemical, and biological integrity of the receiving water will be protected and sustained, considering the state of the receiving water before the proposal is implemented and considering both low and high flow conditions and potential adverse impacts due to changes in temperature and nutrient loadings.” I understand the intent of providing more detail, and wanting to know if there would be impacts based on a baseline condition for a stream. But as written, it also could be interpreted that if the “state of the receiving water” is poor, that it is not required that the physical, chemical, and biological integrity of that stream should be protected. I don’t think that is your intent. I also think factors like bacteria/pathogens are just as important as temperature and nutrients, especially when return flows, like the case with Waukesha, convert a stream to “effluent dominated” post-diversion.

And for the record, we still don’t agree with the Department’s interpretation that an exception to the prohibition on diversions should be granted if the entity seeking the water predominantly provides water for residential uses, when its clear the water being diverted is going to an industry, or fueling sprawl. In the case of the Foxconn diversion, people were forced from their homes and farms for that project, which has largely fallen apart. And now several of the areas in question are going to be redeveloped as subdivisions, which seems highly unfair to the Wisconsinites that lost their homes and had to move, compensated or not. Also, every city that is a water supplier along Lake Michigan can claim that they are predominantly serving residential uses (due to decline of industry), and if the “use” of the diverted water is not considered, I fear that it degrades the spirit and intent of the Compact that water should be provided for predominantly residential water uses and only when there is no reasonable water supply alternative.

Best,

Cheryl

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