STATE OF MICHIGAN

OFFICE OF THE GREAT LAKES

LANSING

RICK SNYDER

GOVERNOR

JON W. ALLAN

DIRECTOR

STATE OF MICHIGAN'S SUMMARY STATEMENT:

Referencing the Final Decision Document

No. 2016-1

Of the Great Lakes Compact Council

Explanation of Review Process And

Rationale for Decision

The City of Waukesha's Application to use Great Lakes Water for its Water Supply

Under the Great Lakes—St. Lawrence River Basin Water Resources Compact ("Compact")

June 22, 2016

Office of the Great Lakes

Michigan Department of Environmental Quality

EXECUTIVE SUMMARY

On January 7, 2016, the State of Wisconsin forwarded the City of Waukesha's application ("Application") for an exception to the prohibition of diversions to the Great Lakes—St. Lawrence River Water Resources Regional Body ("Regional Body") and the Great Lakes—St. Lawrence River Basin Water Resources Council ("Compact Council") for Regional Review. In response Governor Snyder directed the Michigan Office of Great Lakes to coordinate the review of this Application applying the criteria established under the Great Lakes—St. Lawrence River Basin Water Resources Compact ("Compact"). In addition, he required a full and open public review process including consultations with Tribal Leadership in Michigan.

After extensive and in-depth review of the Application and each of the Compact criteria, as well as consultation with internal and external experts, the other Great Lake States, Ontario, and Quebec, Michigan and the Regional Body concluded that the Application could be approved, but only with certain conditions. Michigan's review and analysis systematically addressed each of the criteria listed in Section 4.9.3 of the Compact[1] including the last sentence which states:

> *"A Proposal must satisfy all of the conditions listed above. Further, substantive consideration will also be given to whether or not the Proposal can provide sufficient scientifically based evidence that the existing water supply is derived from groundwater that is hydrologically interconnected to Waters of the Great Lakes Basin."*

Michigan re-examined the record in light of this provision to investigate what scientific evidence existed of an interconnection between the City of Waukesha deep aquifer pumping and the Great Lakes Basin. Not only is there such an interconnection, but Waukesha's deep aquifer pumping is, from a technical hydrological basis, currently diverting water out of the Great Lakes Basin.

Therefore, when all of the criteria are considered and the Application is looked at in its entirety, not only are the legally required individual criteria met with the proposed conditions, but an additional compelling reason for an approval is to stop an ongoing technical diversion. Ending that diversion will support the central purpose of the Compact - conserving and protecting the waters of the Great Lakes Basin. This decision is based on the technical merits and compliance with ALL the Compact criteria and the best technical basis to protect the Great Lakes.

After considering all Compact criteria and the Application in its entirety, our evaluation of the record supports the following principal conclusions. Lake Michigan water is the only alternative that:

- offers a sustainable, accessible, adequate and uncontaminated water supply to the people of Waukesha;
- stops the extraction and dispersion of radium in the environment;
- avoids adverse impacts on wetlands in Waukesha; and
- creates real net benefits to the Great Lakes Basin by stopping the current loss of over a half billion gallons of water per year from the Great Lakes Basin.

[1] Great Lakes—St. Lawrence River Basin Resources Compact, Pub. L. No. 110-342, § 4.9.3, 122 Stat. 3739, 3754 (2008)

Introduction

This summary has been prepared to provide an overview of the State of Michigan's in-depth technical review of the City of Waukesha's Application. Governor Snyder, in recognition of the strong and passionate interests of the many Great Lakes stakeholders, requested a rigorous technical review by a multidisciplinary team of professionals and a comprehensive public engagement process. Furthermore, he asked that the integrity, durability, and best interests of the Great Lakes Compact be a paramount factor in this analysis.

Review Process

The State of Michigan's review team led by the Office of Great Lakes, sought input from Tribal Leadership, environmental organizations, and the general public. Michigan held a formal public hearing and a formal comment period, received and reviewed multiple comments from various sources, and continued dialogue with interest groups throughout the process.

The discussion below follows the sequence of the analysis and explains the basis for Michigan's final recommendation. In summary, the initial application as filed by the City of Waukesha did not warrant approval. However, after an in-depth review process and discussion among the various jurisdictions, a series of needed changes and conditions were identified and negotiated into the Regional Body's final recommendations. With those changes and conditions, the proposal not only satisfies the specific technical criteria of the Compact, but furthers the central purpose of the Compact by ending an existing diversion.

Water Service Area

The Great Lakes Compact allows a "community within a straddling county"[2] to apply for Great Lakes water. The City of Waukesha is such a community. As initially filed, the application requested water to serve an area well beyond the boundaries of the City of Waukesha and, in fact, included parts of several other communities including the City of Pewaukee and the Towns of Waukesha, Genesee, and Delafield. All jurisdictions represented on the Regional Body and the majority of public stakeholders found this inconsistent with the Compact and therefore unsupportable. The Regional Body engaged in a technical review of the underlying reasons suggested for adding these areas outside the City of Waukesha, including a search for existing contracts that would support such service.

A continuum of circumstances was identified for potentially justifying the inclusion of certain areas within the water service area as follows:

- Areas within the City of Waukesha boundaries (a defined community under the Compact)
- Areas outside the City boundaries but currently served by the City
- Areas in the Town of Waukesha entirely surrounded by the City (referred to as "Town Islands")
- Areas outside the City boundaries that are transected by or immediately adjacent to a primary City water supply line
- Areas adjacent to the City with possibly no other source of water if current supplies fail

[2] A community within a straddling county is "any incorporated city . . . located outside the Basin but wholly within a County that lies partly within the Basin and that is not a Straddling Community." See section 1.2 of the Compact.

The Regional Body considered the Compact requirements for sustainable and reasonable water supply alternatives under each set of circumstances and concluded that, in addition to the areas within the City boundaries, the following should be included in the water service area:

- Areas outside the City boundaries but currently served by the City, because it would be patently unreasonable to cut off existing service as part of this process
- Areas referred to as "Town Islands," because it would be unreasonable to impose the burden of interconnecting these areas (either completely surrounded by the City or are bordered on one side by a transportation right-of-way and on the remaining sides by the City) to a Town (or other operator) operated water supply system with a second network of water supply lines from outside the City
- It was not reasonable or consistent with the Compact to include any other area or category

Once these areas were accurately mapped, the conditional language was adopted incorporating the revised water service area map as a condition of approval. Michigan endorsed this solution for the reasons stated. See attachment 1 on page 10, and the "Approved Diversion Area" map on page 11. This resulted in a land based area reduction of 47% from the original application.

Demand Forecast – Flow Request

Substantial comments were submitted by stakeholders challenging the basis of the water supply demand forecasts provided by the City. However, the condition adopting the modified water service area inherently placed a limit on future demand. Therefore, further review of water demand forecasts was based on a smaller service area as a growth and demand limiting factor. Wisconsin DNR ("WDNR"), as the Originating Party, presented its analysis of the applicable demand forecasts considering WDNR standard practices and analysis provided by the Southeastern Wisconsin Regional Planning Commission ("SEWRPC"), the official local metropolitan planning organization. WDNR concluded that a flow of 8.2 MGD was appropriate and consistent with Wisconsin water supply planning principles and SEWRPC projections. It is accepted practice that the process for estimating growth patterns and specifically population and water use demand depends on multi-variable analyses and a range of assumptions that can often lead to a wide range of possible outcomes.

Given that the service area was defined with specific boundaries limiting any future development areas and given the substantial normal variability in long-term population and water use growth patterns, it was considered reasonable to accept the proposed 8.2 MGD withdrawal limit as proposed and justified by WDNR relying on SEWRPC input. ***Condition B (this and all subsequent "conditions" are referenced from the Council's Final Decision Section III Subsection 2)*** limits the service area as described and the amount of water to a maximum of 8.2 MGD (Annual Average Day Demand).

Water Conservation Program

Wisconsin has a mandatory conservation requirement under Chapter 852 of its Natural Resources Code, and the City has actively implemented a variety of water conservation programs. A number of comments from stakeholders demanded a more rigorous conservation program as a condition of approval. However, after reviewing the City's conservation program and considering the assessment by Wisconsin, we concluded that the City has made substantial progress already in implementing water conservation measures and as a result is not likely to

avoid the need for new water supply by further reductions in use based on additional conservation. ***Condition C*** requires the City to meet or exceed a 10% reduction in demand and update that plan a minimum of every 10 years.

Alternatives Analysis

This subject generated a substantial volume of comments. For example, it was suggested that Waukesha could and should do more to effectively implement better water conservation measures. A community within a straddling county seeking an exception to the prohibition against diversions must meet conditions including that "[t]here is no reasonable water supply alternative within the basin in which the community is located, including conservation of existing water supplies."[3]

Michigan considered the water supply alternatives evaluated by the City including the identified adverse impacts associated with each option. Michigan asked our multi-agency technical staff to evaluate what WDNR had presented in their Technical Review and cross reference their statements with our interpretation and evaluation of those same Compact criteria. We presented a summary of our alternatives analysis in Michigan's Technical Review document submitted to the Compact Council on March 22, 2016. (See pages 15 through 17 of the Technical Review.)

Those alternatives that relied on pumping from the deep aquifer present significant long-term sustainability concerns. Even if pumping rates decline in the City the continued overuse of this deep aquifer is not, in our view, reasonably sustainable to provide Waukesha with an adequate accessible and uncontaminated water supply. Other users may continue to pump from this aquifer and consequently, treating radium in one manner or another by the City of Waukesha would be required in perpetuity because there is no short-term or long-term means identified in the record to abate the radium, short of simply not pumping the water. As a radioactive substance, once removed from the ground the radium must be properly treated, which inevitably results in dispersion of radium in the environment. Treatment byproducts created by radium treatment systems must be disposed of, and there are inevitably residual releases of radium into surface water or incidental human ingestion. Therefore, all alternatives that rely on pumping from the deep aquifer inevitably create radioactive waste disposal issues.

The alternatives that rely on pumping from the shallow aquifer cannot be reasonably sustained without permanent adverse impacts on surface waters including wetlands, streams, and other surface water bodies – something Michigan would not allow if this were in Michigan.[4]

Moreover, Michigan considered the fundamental findings in the Compact. Section 1.3.1.e states that "[c]ontinued sustainable, accessible and adequate Water supplies for the people and economy of the Basin are of vital importance."[5] After all of the alternatives were evaluated, the only option that provided a reasonable sustainable and accessible long term water supply without residual radium contamination was Lake Michigan water.

[3] *Id.* § 4.9.3.d.
[4] *Id.* §§ 4.9.3.e, 4.9.4.d, 4.11.2.
[5] *Id.* § 1.3.1.e.

Because the use of Lake Michigan water, if approved, would in part be based on avoiding these impacts caused by excessive pumping, ***Conditions D and E*** were adopted in section III subsection 2 of the Council's Final Decision:

- ***Condition D*** prohibits the City from using the deep wells again except for certain limited emergency conditions.
- ***Condition E*** states that WDNR should use all of its available legal authority to prevent other groundwater pumping in the service area that could cause the harm that is being avoided.

Finally, the U.S. Geological Survey ("USGS") and the Wisconsin Geological and Natural History Survey ("WGNHS") groundwater flow models demonstrated a direct interconnection between the deep confined aquifer from which the Applicant withdraws groundwater and the Great Lakes Basin. The models also estimated that about 30% of the water withdrawn by the Applicant's deep wells originates from the Lake Michigan watershed. Water from the Lake Michigan watershed is currently discharged by Waukesha into the Mississippi River Basin via the Fox River.

If the use of Lake Michigan water was approved, it would not only meet the Compact criteria, it would also have the benefit of stopping the current, ongoing diversion of groundwater from the Great Lakes Basin into the Mississippi River Basin. ***Condition F*** was adopted in section III subsection 2 of the Final Decision to secure those benefits.

- ***Condition F*** states that WDNR should use all of its legal authority to prevent any other groundwater withdrawal that would reverse the benefits created by using Lake Michigan water.

A number of public comments strongly asserted that the existing water supply could be adequately treated with existing cost-effective technologies. Those options were considered and in the end did not appear to be evaluated on a common basis with the options proposed by the City. While some communities do treat well water with other technologies, according to WDNR none operate at the flow capacity required by the City. Moreover, despite the request to identify a technology that cost-effectively achieves 100% removal rates, no such option was presented by any stakeholders. This removal rate would be necessary to avoid residual discharges of radium from the treatment processes. As a result, continued reliance on treating water from the deep wells was not considered reasonable and sustainable at the volumes required to serve the City's needs. In effect, continued pumping from the deep wells will result in the extraction and dispersion of radium into the environment via disposal of radium-contaminated wastes, residual discharges from the wastewater treatment plant and residual levels of radium in the drinking water supply. This is not considered a reasonable, environmentally sound and sustainable condition.

After the water service area was reduced to comply with Compact criteria and the authorized flow was reduced to 8.2 MGD, some stakeholders argued Wisconsin and the Applicant should be required to redo the alternatives analysis based on the lower flow under the premise that the outcome of the alternatives analysis might be different at a lower flow rate. However, Wisconsin conducted an updated alternatives analysis using 8.5 MGD as the base flow rate, and for all practical purposes, an analysis based on 8.2 MGD is within the range of variability of an

analysis at 8.5 MGD. An updated alternatives analysis was, therefore, not considered necessary.

Overall Summary of Alternatives and Treatment Options

Consideration of water supply alternatives in conjunction with the suggestion that it is preferable to pump and treat radium-contaminated groundwater, yields a number of conclusions. The Compact acknowledges in its findings that waters of the Basin can serve multiple uses concurrently such as recreation, municipal, fisheries, ecosystem, and water supply. Moreover, "such uses are interdependent and must be balanced."[6] Therefore, when all the alternatives and countervailing concerns relevant under the Compact are balanced, including using advanced radium treatment technologies the following becomes clear. Using Lake Michigan water is the only alternative that:

- Truly offers a sustainable, accessible, adequate water supply for the people of Waukesha *(water supply use)*;
- Avoids adverse impacts on wetlands (the estimated 1 foot draw down adverse impact) *(an ecosystem impact)*;
- Stops the extraction and redistribution of radium into the environment *(an environmental impact)*, and
- Actually creates real net benefits to the Great Lakes Basin by stopping the current loss (diversion) of over a half billion gallons of water per year from the Great Lakes Basin *(net benefit to the Great Lakes Basin)*. See attached exhibit on page 11 illustrating these conditions.

Return Flow

One of the most important Compact requirements under the exception to the prohibition of any new or expanded diversion is the requirement for return flow. A community within a straddling county seeking a diversion must return all withdrawn water to the source watershed, minus an allowance for consumptive use, while maximizing the portion of water returned as Basin water and minimizing the water from outside the Basin.[7] The City proposed 100% return flow, and the WDNR modified the proposal to acknowledge, due to varying weather conditions, that for limited periods of time it may be problematic to provide exactly 100% return flow. Consequently, the requested approval is for approximately 100% return flow. ***Condition H*** addresses the effort necessary to achieve approximately 100% return flow.

A number of stakeholders challenged using the Root River as the route for the return flow arguing that the substantial increase in flow rate could overwhelm the existing Root River environment and adversely impact stream morphology. However, after reviewing the conditions of the return flow and stakeholder concerns, Michigan DNR fisheries specialists concluded there is a net benefit to the Root River (and the Lake Michigan Basin) from increased flow and improved water quality attributable to the return flow. Given that the Root River is currently classified as an impaired river, the return flow in full compliance with all federal and state discharge requirements would actually be of a higher quality than existing river water. To further

[6] Great Lakes—St. Lawrence River Basin Resources Compact § 1.3.1.c.
[7] *Id.* §§ 4.9.3.b, 4.9.4.c.i-.ii

ensure water quality, ***Condition I*** requires the City to implement a scientifically sound plan to monitor the Root River in order to adapt future return flow to minimize potential adverse impacts or maximize potential benefits to the Lake Michigan watershed. ***Condition K*** requires the City to comply with all federal and state permit conditions applicable to this return flow.

During Michigan's tribal consultation a concern was raised about possible adverse impacts from the return flow due to contamination from pharmaceuticals and personal care products. ***Condition G*** addresses this concern by requiring the City to implement a pharmaceutical and personal care products recycling program to reduce the release of such products into the return flow. Finally, ***Condition J*** requires annual reporting on the amount of water withdrawn and returned to the Lake Michigan watershed, the implementation and effectiveness of the water conservation and efficiency program. Therefore, the return flow program was considered reasonable and appropriate with these conditions in place.

Existing Diversion

Under the Compact, *"substantive consideration will also be given to whether or not the Proposal can provide sufficient scientifically based evidence that the existing water supply is derived from groundwater that is hydrologically interconnected to Waters of the Basin."*[8] During the development of Michigan's Technical Review, there was insufficient opportunity to research this condition and still make the March 22 deadline to submit the Technical Review after the public participation process. However, we did identify two critical issues after the Technical Review was submitted. First, not only does the Compact require a review of alternatives, but the Compact requires sustainable water supplies for people and sustainable use of water resources – a point that was not highlighted earlier.[9] When each of the alternatives is measured from a sustainability perspective, continued pumping of an over-depleted deep aquifer is not sustainable. No one can reasonably assert that pumping will decline over time (25 to 50 years) without significant intervention despite recent partial recovery of groundwater levels. Continued pumping and likely increased pumping extracts radium and redistributes residual radium in the environment – we do not consider that a reasonably sustainable practice even if pumping rates declined.

As discussed above, Michigan's analysis concluded that each of the applicable criteria, with the required conditions, can be met. Further analysis of the interconnected nature of the water resources of the Great Lakes Basin reveals an additional and final compelling justification for a conditional approval. A review of the long-term water supply analysis previously prepared by USGS and the Wisconsin Geological and Natural History Survey, University of Wisconsin-Extension showed that an estimated 30% of the water discharged by Waukesha into the Mississippi River Basin originates from within the Lake Michigan Basin – at an estimated rate of over a half billion gallons of water per year. Waukesha's continued pumping from the deep aquifer perpetuates this loss of water from the Great Lakes and is in effect an ongoing hydrological and technical diversion. The conditional approval of Waukesha's modified proposal will have the additional significant benefit of ending that diversion of water from the Great Lakes Basin.

[8] *Id.* § 4.9.3.
[9] *Id.* §§ 1.3.e, 4.2.1.d.

Enforceability

A number of jurisdictions and stakeholders expressed concern about enforcement of the approval if granted. Pursuant to the Compact, *"[a]ny Party or the Council may initiate actions to compel compliance with the provisions of this Compact, and the rules and regulations promulgated hereunder by the Council."*[10] The proposed Compact Council order makes it clear that an approval of this Application with conditions is an action under the provisions of the Compact and acknowledges that the Council's final decision will be enforceable by the Council. Michigan agrees with the Compact Council that any Compact Council approval will be enforceable by the Council (and each jurisdiction) under the Compact pursuant to section 7.3.2.a. ***Condition L*** enables the Compact Council or any Party, upon 30 days advance written notice, to conduct an independent inspection and audit of the City of Waukesha's operations and WDNR's oversight and enforcement actions, in order to assess and confirm compliance with this approval and all its Conditions. ***Condition M*** and ***Finding 15*** (from section II) describe the basis for and explain the means of enforcement from the Compact's authority.

Furthermore, ***Condition E*** provides that WDNR should use all of its legal authority to prevent other groundwater pumping in the service area that could cause the harm that is being avoided, and ***Condition F*** provides that WDNR should use all of its legal authority to prevent any other groundwater withdrawal that would reverse the benefits created by using Lake Michigan water.

Additionally, WDNR will issue an approval of the diversion under the straddling counties provision of Wisconsin law,[11] incorporating all of the conditions imposed by the Compact Council order. Any violations of this approval will be subject to enforcement by Wisconsin under section 281.346(14),[12] which provides:

> *PENALTIES. (a) Any person who violates this section or any rule promulgated or approval issued under this section shall forfeit not less than $10 nor more than $10,000 for each violation. Each day of continued violation is a separate offense.*
> *(c) In addition to the penalties under par. (a), the court may order the defendant to abate any nuisance, restore a natural resource, or take, or refrain from taking, any other action as necessary to eliminate or minimize any environmental damage caused by the violation.*

Decision Precedent

Any decision that is the first of its kind is a precedent by definition. The issue is not whether this decision is a precedent but rather whether it is justified on its merits and whether the record supports the rationale for the decision. Furthermore, the Compact Final Decision specifically found, in accordance with Compact criteria (section 4.9.4.d) that any precedent-setting consequences associated with the Application will not adversely impact the Waters and Water Dependent Natural Resources of the Basin.

[10] *Id.* § 7.3.2.a
[11] Wis. Stat. § 281.346[4][e]
[12] Wis. Stat. § 281.346(14) (2012).

This decision should make clear to any subsequent applicant that all of the Compact criteria will be thoroughly reviewed and all applications critically judged based on technical and scientific merits. Failure to meet or address any criteria may be sufficient to deny or modify an application if appropriate conditions of approval cannot be found or agreed upon. In Michigan's view a process that builds on the principles of the Compact, as this decision has, and honors the criteria within the Compact strengthens the Compact as the body of experience and precedents grow.

Conclusion

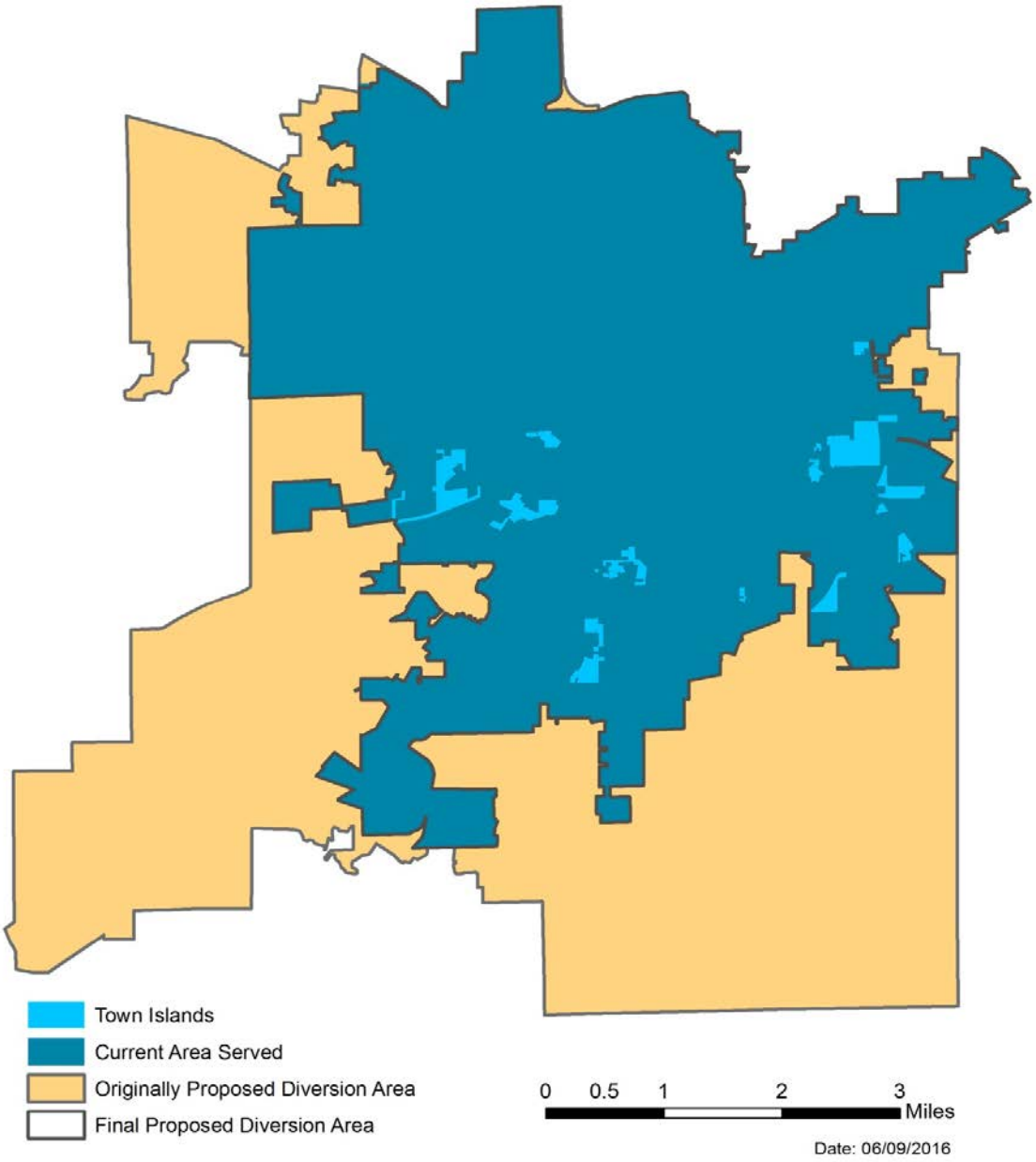
If the Compact is to be strengthened and honored, this application deserves a conditional approval because the technical criteria have been met. And, if so approved, the application will stop an existing diversion, honoring the central purpose of the Compact. The use of Lake Michigan water (with approximately 100% return flow) is the only alternative that achieves this. See attached exhibit on page 11 illustrating these conditions.

Therefore, when all of the criteria are considered and the Application is looked at in its entirety, not only are the legally required individual criteria met with the proposed conditions, but an additional, compelling reason for an approval is to stop an ongoing technical diversion. Ending that diversion will support the central purpose of the Compact - conserving and protecting the waters of the Great Lakes Basin. This is a decision based on the technical merits and compliance with ALL the Compact criteria and the best technical basis to protect the Great Lakes.

After considering all Compact criteria and the Application in its entirety, our evaluation of the record supports the following principal conclusions. Lake Michigan water is the only alternative that:

- offers a sustainable, accessible, adequate and uncontaminated water supply to the people of Waukesha;
- stops the extraction and dispersion of radium in the environment;
- avoids adverse impacts on wetlands in Waukesha, and
- creates real net benefits to the Great Lakes Basin by stopping the current loss of over a half billion gallons of water per year from the Great Lakes Basin.

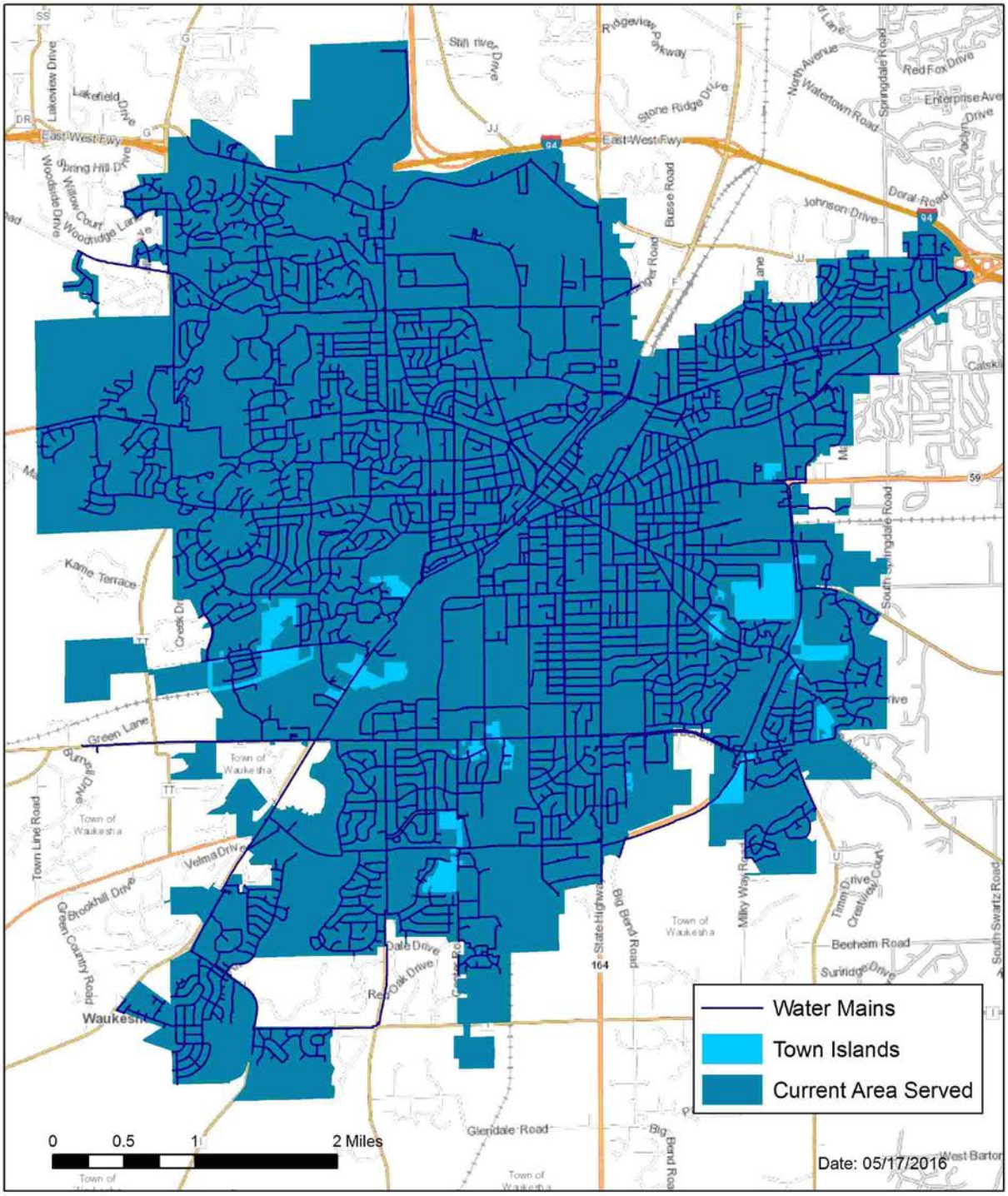
Attachment 1: Compact Council Decision Diversion Area (in blue) vs. Original Proposed Diversion Area (as proposed in Diversion Application in yellow)



- The water service area, as conditioned by the Regional Body Declaration of Finding, represents 53% of the original proposed diversion area in the City of Waukesha's application. (or a 47 % area reduction)

Attachment 2: Approved Diversion Area

Current Areas Served by Waukesha Water Utility and Town Islands updated 5-17-16



CURRENT CONDITIONS **June 20, 2016**

Path of water from Lake Michigan Basin (LMB) to Mississippi River Basin (MRB).

Water from within Lake Michigan Basin replenishes the cone of depression formed by water pumped by Waukesha

→ **City of Waukesha pumps water from Deep Aquifer**

↓

Waukesha Wastewater discharged to Mississippi River Basin/Fox River – LMB water lost to MRB – over half billion gallons per year

In 2005 (using 2000 data) USGS and the Wisconsin Geological and Natural History Survey, University of Wisconsin-Extension estimated approximately 30% of the water that flows into the Waukesha cone of depression (to replenish water pumped from the deep aquifer) originates in the Lake Michigan Basin (see attached USGS/WGNHS summary dated October 20, 2006). At today's pumping rates that would amount to approximately 1.6 MGD (1,600,000 million gallons per day).[13] **When Waukesha discharges its wastewater into the Fox River the net effect is the transfer of water from the Lake Michigan Basin into the Mississippi River Basin without return flow – a current net loss to the Great Lakes of over half a billion gallons per year.**[14]

PROPOSED CONDITIONS

If the requested withdrawal of water from Lake Michigan with return flow is approved **the current loss of approximately 1.6 MGD of Lake Michigan Basin water without return flow will be terminated**. Approximately 100% of all future water withdrawn from Lake Michigan by Waukesha will be returned to Lake Michigan.

(modified from WDNR Technical Review)

[13] NOTE: 1.6 MGD represents about one percent of the total recharge in SE Wisconsin

[14] NOTE: Although some conditions have changed since 2000/2005 the fundamental groundwater regime has not – the deep aquifer groundwater divide remains west of the Waukesha deep aquifer wells – drawing water from areas tributary to Lake Michigan.