EPA's Review of Wisconsin Department of Natural Resources
Request for Approval of a Variance from Mercury Water Quality Standard
City of Beloit, Wisconsin
WPDES Permit No. WI-0023370-09
WQSTS# WI2015-629

Date: JUN 1 5 2015

I. Summary

A. Date received by EPA: April 14, 2015

B. Submittal History:

On April 2, 2015 the Wisconsin Department of Natural Resources (WDNR) submitted a request to the U.S. Environmental Protection Agency for approval of a mercury water quality standard variance for a discharge by the City of Beloit, WPDES Permit No. WI-0023370-09, to the Rock River in Rock County, Wisconsin.

C. Documents included in the official submittal from WDNR:

- Transmittal letter from WDNR to EPA, sent April 2, 2015 and received on April 14, 2015;
- Certification statement for Approval of a Variance to Water Quality Standards, City of Beloit, Wisconsin, WPDES Permit No. WI-0023370-09, dated March 30, 2015 and received on April 14, 2015;
- Notice of Final Intent to Reissue the Permit, undated;
- Final Proposed WPDES Permit (undated);
- Final Permit Fact Sheet, dated March 27, 2015;
- Mercury Pollutant Minimization Program 2014 Annual Report, dated March 24, 2015;
- City of Beloit comments on public noticed draft permit, dated March 18, 2015; and
- Facility Specific Standard Variance Data Sheet, dated March 26, 2013.

D. Preliminary documents submitted by WDNR:

- 2007 Initial Mercury Pollutant Minimization Plan Report;
- 2011 Mercury Pollutant Minimization Plan Report;
- 2012 Mercury Pollutant Minimization Plan Report;
- 2013 Mercury Pollutant Minimization Plan Report;
- Beloit Draft Permit, undated;
- Draft Permit Fact Sheet, dated February 11, 2015;
- WDNR Review and Approval of City of Beloit Annual Mercury PMP Report Dates March 25, 2013;
- WDNR Review and Approval of City of Beloit Annual Mercury PMP Report Dates March 11, 2014;
- Beloit Mercury Trends and P99 Calculation;
- Mercury Variance Application, dated June 6, 2014;
- Public Notice of Intent to Reissue a Wisconsin Pollutant Discharge Elimination System (WPDES) Permit No. WI-0023370-09-0, undated;
- Facility Specific Standard Variance Data Sheet, dated March 26, 2013;
- Outfall Map;

- Map of Other Mercury Variances;
- Substantial Compliance Determination, September 22, 2014; and
- WQBEL Memo, dated October 6, 2014.

E. Description of Action:

WDNR proposes to grant the City of Beloit, Rock County, Wisconsin a variance from Wisconsin's water quality criteria for mercury applicable to the city's discharge from the Beloit Wastewater Treatment Facility to the Rock River in Rock County, Wisconsin. The annual average design flow is 11.0 MGD and the facility's current annual average discharge is 3.7 MGD. The facility is unable to meet the most stringent water quality criterion for mercury that is applicable, which is 1.3 ng/L as a monthly average concentration for the protection of wildlife, although the average effluent concentration is 1.23 ng/L. Beloit has proposed a variance (alternate) limit of 3.3 ng/L as a daily maximum discharge concentration, which is lower than the previous variance limit of 3.6 ng/L.

This alternative limit was calculated pursuant to NR 106.145(5) (a) of the Wisconsin Administrative Code, which provides that the alternate permit limit shall equal the upper 99th percentile of the daily discharge concentrations (1-day P99) of total recoverable mercury, calculated according to NR 106.05(4) and generated using EPA method 1631 for mercury. Information provided by WDNR indicated that the 1-day P99 of Beloit's effluent (Level Currently Achievable) is 3.3 ng/L and this is the proposed alternative mercury effluent limit. In addition to the limit, the permittee must also continue to implement a pollutant minimization program (PMP) plan to identify and eliminate sources of mercury to its wastewater treatment facility. The variance would be in effect from the date of permit reissuance for a period of five years, currently estimated to be July 1, 2015 through June 30, 2020.

F. Basis of Action:

The available data show that the upper 99th percentile of the 30-day average discharge concentration of mercury is 1.52 ng/L. This concentration exceeds the applicable water quality criterion of 1.3 ng/L as a monthly average concentration for the protection of wildlife. In such situations, Wisconsin's administrative rules provide for "alternative mercury effluent limits," also known as a variance.

Wisconsin's administrative rules at Wis. Admin. Code § NR 106.145 provide for alternative mercury effluent limits based on a determination by WDNR that, "Requiring all dischargers of mercury to remove mercury using wastewater treatment technology to achieve discharge concentrations necessary to meet water quality standards would result in substantial and widespread adverse social and economic impacts." (NR 106.145(1) (a)) This finding is based on, "Assessing the Economic Impacts of the Proposed Ohio EPA Water Rules on the Ohio Economy," prepared in 1997 by the Ohio Environmental Protection Agency, Foster Wheeler Environmental Corporation and DRI/McGraw-Hill in support of the multiple discharger variance adopted by the State of Ohio. The primary conclusion of this study was that the treatment technology that is necessary to remove mercury to the level of the water quality standard is either not available or is prohibitively expensive and would have a widespread economic and social impact.

Based on this information, WDNR concluded that:

- Beloit has met the requirements of Subchapter VII of ch. NR 106, Wis. Adm. Code, and s. 283.15, Wis. Stats;

- The expense of building and operating additional treatment to comply with a 1.3 ng/L wildlife criterion for mercury would result in substantial and widespread adverse social and economic impacts; and
- Therefore WDNR proposes to grant the variance for mercury.

II. Areas Affected and Environmental Impacts

A. Area Affected:

The area affected by this variance is the Rock River within the Lower Rock River Basin in Rock County, Wisconsin, which has been classified as a warm water sport fishery, non-public water supply, and also the Rock River below Beloit in Winnebago County, Illinois.

The annual average design flow of the Beloit facility is 11.0 MGD, with a daily maximum of 18.3 MGD. The average effluent discharge rate is 3.7 MGD and the maximum effluent discharge rate is 16.6 MGD, as compared with a seven-day, ten-year low flow (7Q10) for the Rock at Beloit of 142 MGD.

B. Environmental Impacts:

1. Aquatic Life

Wisconsin's aquatic life criteria for mercury are: Acute Mercury (+2) Criterion = 830 ng/L and Chronic Mercury (+2) Criterion = 440 ng/L. The proposed effluent limitation of 3.3 ng/L is significantly less than both the acute and chronic criteria to protect aquatic life. Because the discharge concentration of mercury in the effluent will be limited by the variance to 3.3 ng/L, both the acute and chronic aquatic life criteria will be met at the point where the effluent enters the Rock River. Thus, the variance will have no effect on exposed aquatic life.

Additionally, the ambient mercury concentration in the Rock River at Afton averages 4.74 ng/L and effluent concentration averages 1.23 ng/L at the discharge. Thus, average mercury level in water being discharged to the river is lower than the ambient mercury concentration.

2. Human Health and Wildlife

As a condition of the proposed variance, the discharge concentration is limited in the permit to 3.3 ng/L as a daily maximum. The Rock River at Beloit is not used as a public water supply, however even if it was, this concentration is substantially lower than EPA's current maximum contaminant level of 2 µg/L for mercury in drinking water. Therefore, the proposed variance will not adversely affect human health directly through use as a source of drinking water.

The primary environmental effect of concern for mercury is bioaccumulation of mercury in fish tissue to concentrations that are harmful to fish consumers (wildlife and humans). As indicated, the average background mercury concentration in the Rock River at Afton is 4.74 ng/L, and other waterbodies in southern Wisconsin have ambient concentrations ranging between 2.8 and3.8 ng/L, which are above the 1.3 ng/L water quality criterion for the protection of piscivorous wildlife and above the 1.5 ng/L water quality criterion for the protection of the fish-consuming human population. The discharge of treated water from the Beloit WWTP that has a mercury concentration averaging 1.23 ng/L means that the discharge of treated water from the plant will actually marginally reduce the mercury concentration in the river.

The proposed variance approval includes a compliance schedule which requires continued implementation of the pollutant minimization program (PMP) plan originally submitted to WDNR in 2007 and last updated in March of 2014. The goal of the PMP is to reduce mercury levels of the influent which will then lead to reductions in effluent mercury concentration. Ongoing PMP implementation will reduce the amount of mercury in both the effluent and in biosolids that are extracted from the waste stream. Already, Beloit is able to achieve approximately 97% removal of mercury from the liquid influent through existing conventional and biological treatment.

The PMP plan includes an inventory and outreach campaign to all medical, dental, educational and industrial facilities. The most recent PMP report indicates that 100% compliance with BMP implementation was achieved for all sectors, however there was no description of what those BMPs were. EPA requested more information on BMPs for dental facilities, and WDNR reported that all dental offices in Beloit have installed amalgam separators, which will address the largest local source of mercury (Amy Garbe pers. comm. March 9 2015). Additional outreach is conducted under the PMP plan to the general public to discourage household use of/encourage recycling of mercury-containing products, HVAC wholesalers and contractors collecting and recycling mercury thermostats, auto scrap yards and auto dealerships removing and recycling mercury-containing switches in autos, and promotion of fluorescent bulb recycling. Beloit is also required to submit annual status reports on PMP implementation progress. In the most recent report for 2014, Beloit documented full participation in the medical, dental, school, and industry sectors, with significant outreach to, and participation of, the general public, HVAC, auto switch, and fluorescent bulb sectors. Overall, it appears that Beloit has been very proactive in implementing its mercury PMP plan.

Biosolids from the facility are land applied on area farm land. Because of potential release of mercury from land on which biosolids is applied, lowering levels of mercury in the biosolids will likely reduce the concentration of mercury that winds up in the Rock River via runoff. Mercury levels in the sludge averaged 0.32 mg/kg in 2008 (a total of 4 sample results), well below the "clean sludge" level of 17 mg/Kg and the ceiling concentration for land spreading of 57 mg/kg. If not for the PMP requirement, there would be no regulatory incentive for Beloit to reduce mercury levels in the biosolids. For the above reasons, granting a variance that includes a PMP plan in this situation is consistent with the protection of public health, safety, and welfare. WDNR's final mercury variance determination is also consistent with the CWA, federal regulations and related guidance.

Wisconsin's fish consumption advisory program is designed to mitigate the effect of any ambient mercury concentration above the 1.5 ng/L water quality criterion for the protection of the fish-consuming human population by providing advice to the public to guide them on the amounts of fish that may be consumed safely.

Given the lack of wastewater treatment technologies capable of reducing mercury effluent concentrations to achieve a 1.3 ng/L effluent limitation, granting a variance in this situation is consistent with the protection of the public health, safety and welfare because of the substantial public health and safety benefits of providing wastewater treatment, the continued commitment towards further mercury pollutant minimization, the Wisconsin fish advisory program, and the fact that the discharge of treated water from the plant will actually marginally *reduce* the mercury concentration in the Rock River given the higher ambient mercury concentration.

III. Clean Water Act (CWA) Sections 101(a)(2)/303(c)(2)/118(c)(2)/40 CFR 131 and 132 Review

A. EPA's authority under section 303(c)(2) of the CWA:

Water quality standards requirements of CWA sections 101(a)(2) and 303(c)(2) are implemented through federal regulations contained in 40 CFR 131; water quality standards requirements of CWA section 118, specific to waters of the Great Lakes System, are implemented through federal regulations contained in 40 CFR 132. Federal regulations at 40 CFR 131.21 require EPA to review and approve or disapprove state-adopted water quality standards. In making this determination, EPA must consider the following requirements of 40 CFR 131.5:

- whether state-adopted uses are consistent with CWA requirements;
- whether the state has adopted criteria protective of the designated uses;
- whether the state has followed legal procedures for revising its standards;
- whether state standards are based on appropriate technical and scientific data and analyses; and
- whether the state's submission includes certain basic elements as specified in 40 CFR 131.6.

Section 101(a)(2) of the CWA specifies that designated uses "provide for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water." Section 303(c)(2) of the CWA requires that standards shall protect the public health and shall take into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational, agricultural, industrial, and navigational purposes.

EPA is required to review and approve new and revised water quality standards submitted by states and tribes. The following actions are possible.

- **Approval** (where EPA has concluded that approval of certain revisions will have no effect on listed species, or is otherwise not subject to ESA consultation);
- **Approval subject to ESA consultation** (where EPA has concluded that certain revisions may affect listed species, including beneficial effects);
- **Disapproval** (where EPA has concluded that certain revisions do not meet the requirements of the CWA or federal regulations and guidance); and
- **No EPA action** (where EPA has concluded that certain revisions are not revisions to the state's or tribe's water quality standards and, therefore, do not need to be reviewed under section 303(c) of the CWA).

Consistent with federal regulations at 40 CFR 131.21, new or revised water quality standards do not become effective for CWA purposes until they are approved by EPA.

B. Public Participation, Comments, and Issues Raised on WDNR's Public Notice:

Wisconsin DNR received comments from two parties, the City of Beloit and EPA Region 5 NPDES staff. Neither Beloit's comment nor EPA Region 5's comments pertained to mercury.

C. EPA's Review of WDNR's Final Rules:

1. Review of Submittal for Completeness

Regulatory Requirement:	Beloit, Wisconsin Mercury Variance Submittal:
Use designations consistent with the provisions of section 101(a)(2) and 303(c)(2) of the Act **(40 CFR 131.6(a))**	The designated uses for the Rock River at Beloit are warm wate. sport fishery and wildlife; is not a public water supply.
Methods used and analyses conducted to support WQS revisions **(40 CFR 131.6(b))**	Documents submitted by Wisconsin in support of this variance include all items listed above under I.C. and I.D.
Water quality criteria sufficient to protect the designated uses **(40 CFR 131.6(c))**	Not applicable. Water quality criteria are not being affected by this variance.
An antidegradation policy consistent with §131.12 **(40 CFR 131.6(d))**	Not applicable. This variance does not affect Wisconsin's existing antidegradation policy.
Certification by the State Attorney General or other appropriate legal authority within the State that the WQS were duly adopted pursuant to State law. **(40 CFR 131.6(e))**	WDNR's General Counsel certified the variance in a letter from Timothy A. Andryk to Tinka Hyde, dated March 30, 2015.
General information which will aid the Agency in determining the adequacy of the scientific basis of the standards which do not include uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to state standards which may affect their application and implementation. **(40 CFR 131.6(f))**	The information submitted by WDNR and Beloit is described above. The annual average design flow is 11 MGD, and the facility's current annual average discharge is 3.7 MGD. As a condition of the variance, Beloit is required to continue to implement a PMP. The goal of this requirement is to further reduce levels of mercury in the effluent. This information was submitted by WDNR and is described above.

2. EPA Action on the Final Variance submitted by Wisconsin

The information provided by WDNR meets the substantive requirements for a water quality standard submittal of 40 CFR 131.6. In addition, the information provided by WDNR demonstrates that the Wisconsin mercury criterion for the protection of wildlife is neither attained nor attainable near the discharge from the Beloit WWTP discharge to the Rock River, consistent with 40 CFR 131.10(g)(6).

Wildlife is able to use the Rock River for forage and drinking water, and there may be exposure to marginally higher levels of mercury than would occur if the wildlife criterion of 1.3 ng/L was attained. However, it was determined that not allowing a variance would result in substantial and widespread social and economic impact. In addition, the discharge of treated water from the Beloit WWTP that has a mercury concentration averaging 1.23 ng/L, lower than the 4.74 ng/L estimated background concentration for the Rock River, means that the discharge of treated water from the plant will actually marginally reduce the mercury concentration in the river. As Beloit continues to implement the mercury PMP, reductions in the amount of mercury discharge should occur. Therefore, WDNR's final mercury variance determination is consistent with the CWA and federal regulations and guidance. EPA approves WDNR's final mercury variance determination for Beloit.

IV. Endangered Species Act (ESA) Requirements

As required under section 7 of the ESA and federal regulations at 50 CRF Part 402, EPA is required to consult with the U.S. Fish and Wildlife Service (FWS) on any action taken by EPA that may affect

federally-listed threatened or endangered species or their critical habitat. Actions are considered to have the potential to affect listed species if listed species are present in the action area. The action area for this mercury variance is the Rock River immediately downstream of the Beloit WWTP outfall, which extends into Winnebago County, Illinois.

Section 7(a)(2) requires that federal agencies, in consultation with the Service(s), insure that their actions are not likely to jeopardize the existence of federally-listed species or result in the adverse modification of designated critical habitat of such species. On May 18, 2015 EPA initiated consultation with the Illinois Field Office of the FWS regarding the Beloit mercury variance. EPA has analyzed the effect of EPA's approval action on listed species and their designated critical habitat. As documented in the enclosed biological evaluation, EPA has determined that its action may affect, but is not likely to adversely affect, the Indiana bat in Winnebago County, Illinois, and there will be no effect on any other species or critical habitat in either Rock County, Wisconsin or Winnebago County, Illinois. Accordingly, EPA does not expect impacts of concern to occur to listed aquatic or aquatic dependent species in the action area prior to the completion of consultation.

Upon initiation of consultation, section 7(d) of the ESA prohibits irreversible or irretrievable commitments of resources that have the effect of foreclosing the formulation or implementation of reasonable and prudent alternatives which would not violate section 7(a)(2) of the ESA. While EPA does not believe that FWS will conclude that its action violates section 7(a)(2), its action does not foreclose either the formulation by the Services(s), or the implementation by EPA, of any alternatives that might be determined in the consultation to be needed to comply with section 7(a)(2) of the ESA. By approving the standards subject to the results of consultation under section 7(a)(2) of the ESA, EPA has explicitly stated that it retains its discretion to take appropriate action if the consultation identifies deficiencies in the water quality standard requiring remedial action. EPA retains the full range of options available under section 303(c) for ensuring water quality standards are environmentally protective. For example, EPA can: work with Wisconsin to ensure that the standards are revised as needed to ensure the protection of listed species, initiate rulemaking to promulgate federal standards to supersede the standards, or, in appropriate circumstances, change EPA's approval to disapproval.

V. Tribal Consultation Requirements

On May 4, 2011, EPA issued the "EPA Policy on Consultation and Coordination with Indian Tribes" to address Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments." The EPA Tribal Consultation Policy states that "EPA's policy is to consult on a government-to-government basis with federally recognized tribes when EPA actions and decisions may affect tribal interests."

EPA consulted the location of tribal lands in the Beloit area and determined that there were no tribal lands in the area, thus variance approval will not affect any tribal interests.

VI. Additional Documents Considered by EPA

Brack Jr., V. and R.K. LaVal. 1985. Food habits of the Indiana bat in Missouri. Journal of Mammalogy, Volume 66, # 2, pp. 308-315.

Delphey, Phil. U.S. Fish and Wildlife Service. Email correspondence concerning the distribution of the eastern massasauga rattlesnake in Rock County WI.

Garbe, Amy. Wisconsin DNR. Email correspondence concerning PMP implementation, March 9, 2015.

Lee, Y. and G.F. McCracken. 2004. Flight activity and food habits of three species of *Myotis* bats (Chiroptera: Vespertilionidae) in sympatry. Zoological Studies 43(3): 589-597.

Pollack, Cathy. U.S. Fish and Wildlife Service. March 23, 2015. Email correspondence concerning the distribution of the eastern prairie fringed orchid,

U.S. Environmental Protection Agency. 1995. Interim Economic Guidance for Water Quality Standards – Workbook. EPA-823-B-95-002, March 1995, Office of Water.

U.S. Environmental Protection Agency. 2015. Biological evaluation of revisions to Wisconsin's water quality standard for mercury, Beloit Wastewater Treatment Plant.

U.S. Fish and Wildlife Service. 1999. Indiana Bat (*Myotis sodalis*) Revised Recovery Plan. Agency Draft prepared by the Indiana Bat Recovery Team for Region 3, U.S. Fish and Wildlife Service.