Permit Modification Fact Sheet

Changes from the previous permit fact sheet are highlighted in grey.

General Information

Permit Number:	WI-0061891-04-1
Permittee Name:	Wisconsin Public Service Corp
Address:	310 E Frontage Rd
City/State/Zip:	Kaukauna WI 54130-9674
Discharge Location:	Approximate 44 °18'58" N and 88°12'20" W
Receiving Water:	The lower Fox River in Outagamie County
StreamFlow ($Q_{7,10}$):	970 cubic feet per second
Stream Classification:	Warm Water Sport Fish Community, not a public water supply

Facility Description

Wisconsin Public Service (WPS) operates natural gas-fired combined-cycle power generating facility with two combustion turbines and associated electric generators. Under peak demand conditions, the facility has capacity to produce approximately 630 MW of electricity. The two combustion turbines exhaust hot gases to a heat recovery steam generator and steam turbine to produce additional power. A mechanical draft, wet cooling tower is used to condense the low pressure, low temperature steam after the heat recovery generator. Operation of the generating units at the Fox Energy Center fluctuates depending on market conditions and consumer demand.

Currently, this facility operates five to seven days a week, operating more like a baseload generating facility. This is due to low natural gas prices that made operating this facility more economical than other units within the Midcontinent Independent System Operator (MISO) grid. Historically, the plant had generated electricity intermittently in the summer and infrequently in the winter to provide peaking power to the Midwest electrical grid. The facility is still considered an intermittent discharger even when operating seven days a week because discharge at Outfall 001 is still not continuous during plant operation.

Metal cleaning wastewater generated by this facility (such as turbine blade wash water) is collected and transported off-site by a contractor. All sanitary wastewater from facility bathrooms is sent to on-site holding tanks and transported by a contractor to a treatment plant.

Fox Energy uses treated effluent from the Heart of the Valley (HOV) Metropolitan Sewerage District treatment plant in Kaukauna as its source of non-potable process water and cooling water. The incoming HOV effluent is treated in a cold lime softening clarification system followed by chlorination and pH adjustment (to control biological growth) prior to storage in a 5 million gallon, on-site service water storage pond. The service water is primarily used to replace water lost from the condenser cooling system due to blowdown and evaporation from the cooling tower. As water evaporates from the cooling tower, the dissolved solids concentration increases in the recirculated cooling system. When needed to remove high dissolved solids concentrations, the facility discharges a portion of the cooling system water to the Fox River.

During high demand, hot weather days, the discharge to the Fox River can reach 1 million gallons per day (mgd). Even when the plant is not generating electricity, some service water is added to the condenser cooling water system each day due to the need to maintain stand-by operations at the facility. Stand-by status allows the facility to generate electricity within 12 – 24 hours if requested by the electrical grid operator.

Stored service water is also used in the boiler systems, combustion turbine and plant service water system. For these uses, the service water is further treated with sand/diatomaceous earth filtration, reverse osmosis and ion exchange

demineralizers. The reverse osmosis reject water and the filter backwash is returned to the intake water lime softening clarifier for solids removal and water reuse. All ion exchange resin units are regenerated off site. Small amounts of service water from floor and sink drains and groundwater seepage into underground vaults may also be mixed (after oil/water separation) into the condenser cooling water. The power plant wastewater is treated with sodium bisulfite to eliminate residual halogens before the wastewater is discharged to the Fox River via a submerged discharge structure. The design and operation of the outlet structure allows a 6.1 to 1 dilution factor within a zone of initial dilution (ZID); the ZID was approved in a permit modification in 2004. This dilution factor is used to calculate water quality based effluent limitations for total residual halogen. The permit also contains BOD5 limitations which ensure that the combined discharges from HOV and Fox Energy do not exceed the BOD waste load for the Fox River originally allocated to HOV in ch. NR 212, Wis. Adm. Code.

Service water from Heart of the Valley is occasionally treated and used for dust suppression and building washing; this was previously included in an inplant sample point but has been moved to the land application section of the permit to better describe this process and additional requirements have been included in this permit for this outfall to prevent and minimize discharge to groundwater.

Substantial Compliance Determination

After a desk top review and a site visit, this facility has been found to be in substantial compliance with their current permit.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
701	Influent, not applicable	Water from the Heart of the Valley Wastewater Treatment Facility prior to any treatment by Fox Energy
001	Maximum annual average 0.786 MGD in 2020; Maximum single day flow 0.930 MGD on July 23, 2018.	Discharge from the condenser cooling tower system to the Fox River. The condenser cooling system water consists of a mixture of various amounts of clarified intake water, reverse osmosis reject water, quenched blowdown of demineralized boiler water, service water to floor and sink drains, groundwater from electrical vault seepage and other miscellaneous clear waters.
088	Not applicable	Discharge reporting to show compliance with BOD Waste Load Allocation limits for the Fox River at Kaukauna. This is a compliance evaluation sample point; it is NOT an actual discharge pipe to the Fox River.
101	Annual maximum of 345 gallons in 2018.	This sample point has been deleted and replaced with sample point 201.
201	Annual maximum of 345 gallons in 2018.	Service water for dust suppression on roads and parking lots on-site, use as building wash water, and fire suppressant testing. This water is effluent from Heart of the Valley (after Fox Energy intake treatment of water supplied by Heart of the Valley). This was previously listed as an intake sample point 101.
102	Field Blank, not applicable.	Field blank sample collected at the same time as the 001 effluent sample

1 Influent - Proposed Monitoring

Sample Point Number: 701- Inflow from HOV WW

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Total Daily	
Mercury, Total Recoverable		ng/L	Monthly	Grab	
Mercury, Total Recoverable		lbs/month	Monthly	Calculated	
BOD_5		mg/L	Daily	Grab	Daily monitoring is required during the months of May to October and 1x/week from November to April.
BOD_5		lbs/day	Daily	Calculated	Daily monitoring is required during the months of May to October and 1x/week from November to April.

Changes from Previous Permit:

Monitoring of BOD_5 has been added to this sample point.

Explanation of Limits and Monitoring Requirements

Total Recoverable Mercury is included to monitor and determine the amount of mercury that is being added by the facility in comparison to the amount from the source water.

During the waste load allocation season (May – October) the Fox Energy BOD_5 discharge limits are based on the BOD_5 remaining after the Heart of the Valley discharge amount is subtracted from the HOV allocation contained in NR 212, Wis. Adm. Code. This monitoring will allow the department and facility to record the BOD_5 in an easily retrievable location and properly calculate the discharge limits at Fox Energy. See BOD_5 section of the permit for further explanation of the waste load allocation and discharge limits.

The mg/L and lb/day BOD*5* for sample point 701 can be completed on the DMR with data provided by Heart of the Valley. However, if Heart of the Valley does not provide this data to WPS Fox Energy, then WPS Fox Energy is required to complete this sampling and calculations. Because of this variability, a note must be included on the DMR indicating which entity is taking the initial sample and doing the calculation.

2 Inplant - Proposed Monitoring and Limitations

Sample Point Number: 101- Service water (treated intake)

Changes from Previous Permit:

This sample point has been deleted and replaced with outfall 201 in the land application section of the permit.

Sample Point Number: 102- Effluent field blank

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Blank	

Changes from Previous Permit:

None

Explanation of Limits and Monitoring Requirements

The mercury field blank is needed to confirm minimal sample contamination during low level mercury sample collection procedures.

3 Surface Water - Proposed Monitoring and Limitations

Sample Point Number: 001- Power Plant Effluent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Total Daily	
Temperature Maximum	Daily Max	120 deg F	Daily	Continuous	
BOD_5, Total		mg/L	Daily	24-Hr Comp	See BOD_5 Limits Section in the permit.
BOD_5, Total		lbs/day	Daily	Calculated	See Daily and weekly limits for May through October in BOD_5 Limits Section of the permit.
pH (Minimum)	Daily Min	4.0 su	Daily	Continuous	
pH (Maximum)	Daily Max	11 su	Daily	Continuous	
pH Exceedances Greater Than 60 Minutes	Daily Max	0 Number	Daily	Continuous	
pH Total Exceedance Time Minutes	Monthly Total	446 minutes	Daily	Continuous	
Suspended Solids, Total	Daily Max	100 mg/L	Weekly	24-Hr Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	Weekly	24-Hr Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total	Daily Max	413 lbs/day	Weekly	Calculated	
Suspended Solids, Total	Monthly Avg	215 lbs/day	Weekly	Calculated	
Mercury, Total Recoverable	Monthly Avg	ng/L	Monthly	Grab	Monitoring only.
Mercury, Total Recoverable	Monthly Avg	lbs/day	Monthly	Calculated	Monitoring only.
Oil & Grease (Hexane)	Daily Max	20 mg/L	Weekly	Grab	
Oil & Grease (Hexane)	Monthly Avg	15 mg/L	Weekly	Grab	
Phosphorus, Total	Monthly Avg	3.3 lbs/day	Weekly	Calculated	
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	Weekly	24-Hr Comp	
Halogen, Total Residual as Cl2	Daily Max	69 ug/L	Daily	Grab	
Chromium, Total Recoverable	Daily Max	0.2 mg/L	Monthly	24-Hr Comp	
Chromium, Total Recoverable	Monthly Avg	0.2 mg/L	Monthly	24-Hr Comp	
Zinc, Total Recoverable	Daily Max	1.0 mg/L	Monthly	24-Hr Comp	
Zinc, Total Recoverable	Monthly Avg	1.0 mg/L	Monthly	24-Hr Comp	
PFOS		ng/L	Monthly	Grab	Monitoring only. See the PFOS and PFOA Minimization Plan Requirements section and the PFOS and PFOA Minimization Plan Schedule.
PFOA		ng/L	Monthly	Grab	Monitoring only. See the PFOS and PFOA Minimization Plan Requirements section and the PFOS and PFOA Minimization Plan Schedule.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Acute WET	Daily Max	1.85 TUa	Annual	24-Hr Comp	See listed quarters in the permit.

Changes from Previous Permit

BOD monitoring was previously CBOD. This change is required to be consistent between Heart of the Valley and Fox Energy and because BOD is a more standard measurement of oxygen demand in water.

PFAS and PFOA monitoring has been added to the permit. Language requiring the implementation of a PFOS and PFOA Minimization Plan has been added to the permit.

Explanation of Limits and Monitoring Requirements

Treatment Based Categorical Limits for the Steam Electric Power Generation Facilities

Chapter NR 290 Wis. Adm. Code specifies treatment based limits required for steam electric power generating facilities; Fox Energy must comply with the new source performance standards, which are applicable to any steam electric facility built after November 19, 1982. All steam electric facilities must meet pH, chlorine (as total residual halogen), and polychlorinated biphenyl compound limits (section 3.2.1.8 of the permit), which in this case are continued from the previous permit. All other categorical limits are dependent on the wastewater source and can be found in Table 3 in ch. NR 290 Wis. Adm. Code. Metal cleaning wastewater generated by this facility (such as turbine blade wash water) is collected and transported off-site by a contractor. Stored service water is also used in the boiler systems, combustion turbine and plant service water system. For these uses, the service water is further treated with sand/diatomaceous earth filtration, reverse osmosis and ion exchange demineralizers. The reverse osmosis reject water is directed back to the condenser cooling water system. The filter backwash is returned to the intake water lime softening clarifier for solids removal. All ion exchange units are regenerated off site. Small amounts of service water from floor and sink drains and groundwater seepage (after oil/water separation) into underground vaults may also be mixed into the condenser cooling water. The power plant wastewater discharge is treated with sodium bisulfite to eliminate residual halogens before the wastewater is discharged to the Fox River via a submerged discharge structure. Since all wastewater sources discharged on site are mixed in the cooling tower all categorical limits are applied at the end of pipe. The applicable wastewater sources from Table 3 in ch. NR 290 Wis. Adm. Code are low volume wastewater and cooling tower blow down. These wastewater sources require limits for oil & grease, total suspended solids, zinc, total chromium, and other priority pollutants (section 3.2.1.9 of the permit); all of which are maintained from the last permit. Additional limits have been added for total chromium and zinc to comply with new regulations in ch. NR 106 and 205 Wis. Adm. Code that align with 40 CFR 122.45(d). This rule became effective on September 1, 2016 and requires effluent limits to be expressed as a daily maximum and monthly average for industrial discharges.

New federal regulations on effluent guidelines for steam electric power generating facilities were promulgated in November 2015 and amended in 2020. None of the new effluent guidelines apply to the Fox Energy facility.

Water Quality Based Limits and WET Requirements

(refer to WQBEL memo dated March 27, 2023)

Biological Oxygen Demand Allocation

During the waste load allocation season (May – October) the Fox Energy BOD discharge limits are based on the BOD_5 remaining after the Heart of the Valley discharge amount is subtracted from the HOV allocation contained in NR 212, Wis. Adm. Code. See BOD_5 section of the permit for further explanation of the waste load allocation and discharge limits.

The calculations to determine compliance have been changed from $CBOD_5$ to BOD_5 to be consistent between Heart of the Valley and because NR 212, Wis. Adm. Code's limits are expressed as BOD_5, not $CBOD_5$; the equations are otherwise unchanged. Daily monitoring is required during the months of May to October and 1x/week from November to April.

Halogen, Total Residual as Cl2

In the absence of an antidegradation demonstration showing the need for a higher limit in accordance with ch. NR 104, Wis. Adm. Code, the current daily maximum limit of 69 µg/L will be continued in the reissued permit.

Mercury

There are no changes to mercury limits in this permit. Fox Energy beneficially reuses treated effluent from Heart of the Valley Wastewater Treatment Facility (HOV WWTF) that would otherwise be discharged to the Fox River approximately six miles upstream. HOV WWTF has applied for a variance to the mercury effluent limit in their permit which means that Fox Energy may receive water above the mercury standard. On days that Fox Energy is not in operation, all effluent generated by HOV WWTF is discharged at the HOV WWTF outfall. In the current permit, Fox Energy has demonstrated that there is no net addition of mercury from Fox Energy processes in their discharge to the Fox River, meaning that regardless of Fox Energy operations the mass of mercury originating at HOV WWTF reaches the Fox River. For these reasons, the department has determined that there is no reasonable potential for Fox Energy to exceed the mercury limit for HOV WWTF and ch. NR 106.06 (11) Wis. Adm. Code is an appropriate application for an alternative method of calculating a water quality based effluent limit. This alternative method for calculating a water quality based effluent limit is a continuation from the last permit; Fox Energy shall continue the current monitoring of influent and effluent and make appropriate calculations to demonstrate no addition of mercury to the discharge into the Fox River.

Phosphorus

The phosphorus wasteload allocation has increased from the original TMDL wasteload allocation to add a portion of wasteload allocation from Wisconsin Public Service Pulliam after the facility shut down. The current permit TMDL limits were recalculated in a July 26, 2021 memo and took effect October 1, 2021. Fox Energy can comply with this limit upon issuance of this permit so no compliance schedule is needed. For further explanation of the limit, see page eleven of the WQBEL memo.

The concentration limit of 1.0 mg/L is continued from the past permit pursuant to ch. NR 217.14 Wis. Adm. Code.

PFOS/PFOA

NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for industrial dischargers to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(d), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration industry type and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, it was identified that the industrial discharger category may be a potential source of PFOS/PFOA and that the source water has known levels of PFOS/PFOA.

Language was added to the permit to ensure that the actions outlined in the approved minimization plan are accomplished over the next several years. The determination to require the implementation of a minimization plan will be reevaluated at the next permit reissuance.

Pursuant to s. NR 106.985(1), Wis. Adm. Code, the department notified the permittee on 11/21/2025 of the requirement to develop a PFOS and PFOA Minimization Plan that satisfies the requirements in s. NR 106.99, Wis. Adm. Code. The permittee submitted a minimization plan on 2/18/2026; this plan was approved by the department on 03/02/2026.

Total Suspended Solids (TSS)

The TSS wasteload allocation has increased from the original TMDL wasteload allocation to add a portion of wasteload allocation from Wisconsin Public Service Pulliam after the facility shut down. The current permit TMDL limits were recalculated in a July 26, 2021 memo and took effect October 1, 2021. Fox Energy can comply with this limit upon

issuance of this permit so no compliance schedule is needed. For further explanation of the limit, see page eleven of the WQBEL memo.

Total Residual Halogen (as Cl_2)

The concentration limit is continued based on new regulations in ch. NR 106 and 205 Wis. Adm. Code that align with 40 CFR 122.45(d) and is furthered explained in the WQBEL memo.

Whole Effluent Toxicity

The facility has a WET limit in this permit based on ch. NR 106 Wis. Adm. Code, see the attached addendum to the WQBEL memo. Acute Whole Effluent Toxicity limit of 2.2 TUa was calculated, however the current limit of 1.85 is being kept in this issuance because effluent limits cannot be increased unless the antidegradation and antibacksliding provisions of ch. NR 207, Wis. Adm. Code, are met.

3.1 Sample Point Number: 088- WLA Compliance for BOD

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
WLA 7 Day Sum Of BOD5 Discharged	Daily Max - Variable	lbs/day	Daily	Calculated	Applies May 1-Oct. 31, each year.
WLA BOD5 Discharged	Daily Max - Variable	lbs/day	Daily	Calculated	Applies May 1-Oct. 31, each year.
WLA BOD5 Value		lbs/day	Daily	Calculated	Applies May 1-Oct. 31, each year. In this row, the permittee reports the calculated limits for a given day.
WLA 7 Day Sum Of WLA Values		lbs/day	Daily	Calculated	Applies May 1-Oct. 31, each year. In this row, the permittee reports the calculated limits for a given 7-day period.

3.1.1 Changes from Previous Permit

The calculations to determine compliance have been changed from $CBOD_5$ to BOD_5 to be consistent between Heart of the Valley and because NR 212, Wis. Adm. Code's limits are expressed as BOD_5, not $CBOD_5$, the equations are otherwise unchanged.

3.1.2 Explanation of Limits and Monitoring Requirements

This section provides space in the Discharge Monitoring Report (DMR) for the permittee to report the calculated BOD limits based on HOV effluent. It is not an additional sample point, just a space holder for the calculated limits.

4 Land application

4.1 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

4.1.1 Sampling Point (Outfall) 201 - Dust Suppression Building Washwater, and Fire Suppressant Testing

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		gal	Monthly	Estimated	

4.1.2 Changes to previous permit

The dust suppression and building wash water was previously listed under an in-plant sample point but has been moved to land application to better reflect the discharge. The best management practices listed below have also been added to the permit to minimize and prevent run off to surface water or groundwater.

4.2 Permitted Discharges

The discharge(s) shall be limited to the waste type(s) designated:

4.2.1 Service Water for Dust Suppression-Monitoring and Reporting

Service water may be used for fugitive dust control on roads and parking lots within the Fox Energy power plant site. The application of this water shall be limited so the dust control water seeps into the ground within the Fox Energy site, and an estimated volume shall be recorded in a monthly log and summarized in an annual report to the department as stated in the Schedules Section.

4.2.2 Use of Service Water for Building Wash Water-Monitoring and Reporting

Service water may be used to clean the exterior of buildings on the Fox Energy site. The wash water will be limited so that water seeps into the ground with the Fox Energy site, and an estimated volume shall be recorded in a monthly log and summarized in an annual report to the department as stated in the Schedules Section.

4.2.3 Service Water used for Fire Suppressant Testing

Fire suppressant testing water is discharged to the cooling tower during required testing routines. During these required tests if any water discharges to the ground, and an estimated volume shall be recorded in a monthly log and summarized in an annual report to the department as stated in the Schedules Section.

4.3 Monitoring Requirements

The permittee shall comply with the following monitoring requirements.

4.3.1.1 Runoff Control

The discharge flow rate shall be limited to prevent the runoff of service water or service water mixed with rainwater. The service water may not be discharged during any rainfall events that cause runoff from the site. Uncontaminated storm water may be allowed to drain from the site.

During Fire suppression tests, if any water discharges to the ground, and an estimated volume shall be recorded in a daily log and summarized in an annual report to the department as stated in the Schedules Section.

4.3.1.2 Winter Operations

Winter operation may be allowed as long as the soil surface remains unfrozen. Since treatment efficiency decreases in the winter, the department may require storage or additional treatment of the runoff during cold weather.

4.3.1.3 Approval of Water Treatment Additives for Groundwater Discharge

Permittees shall not place water treatment additives in the service water used for building washing or dust suppression unless the water treatment additive use is approved, in writing, by the Department. Whenever the quantity of a discharge containing additives is increased or the concentration of a water treatment additive is increased, the permittee shall obtain a separate written approval from the Department. The permittee shall maintain records of the monthly water treatment additive use including the additive name, manufacturer, and daily maximum amount used and such usage shall be reported as required by this permit. The permittee shall provide the following information regarding water treatment additives to receive Department approval:

- the commercial name of the additive and the Material Safety Data Sheet (MSDS);
- the proposed frequency of use;
- the amount or concentration to be used; and
- the anticipated discharge concentration

4.3.2 OUTSIDE WASHING WATER

4.3.2.1 Best Management Practices (BMPs)

Activities covered by this permit shall implement applicable BMPs listed below to minimize or eliminate the discharge of contaminants to groundwater and/or surface waters. The permittee shall maintain a copy of BMPs at the site where washing is being performed.

4.3.2.1.1 **Degreasing chemicals:** Degreasing chemicals that contain halogenated hydrocarbons shall not be added to washing solutions.

4.3.2.1.2 **Chemical brighteners/cleaners:** Any such materials, such as hydrofluoric acid on stainless steel, shall be limited to maintain the pH of the washwater discharge between 6.0 and 9.0 standard units, inclusive.

5 Compliance Schedules

5.1 Service Water Use Reporting

Service Water used as specified in Land Application Section shall be reported on an annual basis.

Required Action	Due Date
Service water used as specified in the Land Application Section shall be summarized and submitted in an annual report. The information shall be presented as a yearly total for each separate action. If these actions do not result in a considerable amount of data, the information may be summarized in the notes section of the DMR.	January 31 of each year.

5.2 Mercury Pollutant Minimization Program

As a condition of the variance to the water quality based effluent limitation(s) for mercury granted in accordance with s. NR 106.145(6), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Mercury Progress Reports: Submit an annual mercury progress report related to the pollutant minimization activities for the previous year. The annual mercury progress report shall: Include an analysis of trends in total effluent mercury concentrations based on mercury sampling; and Include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury. The first annual mercury progress report is to be submitted by the Due Date.	03/31/2024
Annual Mercury Progress Report #2: Submit a mercury progress report, related to the pollutant minimization activities for the previous year, as defined above.	03/31/2025
Annual Mercury Progress Report #3: Submit a mercury progress report, related to the pollutant minimization activities for the previous year, as defined above.	03/31/2026
Annual Mercury Progress Report #4: Submit a mercury progress report, related to the pollutant minimization activities for the previous year, as defined above.	03/31/2027
Annual Mercury Progress Report #4: Submit a mercury progress report, related to the pollutant minimization activities for the previous year, as defined above.	03/31/2028
Annual Mercury Reports After Permit Expiration: In the event that this permit is not reissued by the date the permit expires, the permittee shall continue to submit annual mercury reports for the previous year following the due date of Annual Mercury Progress Reports listed above. Annual Mercury Progress reports shall include the information as defined above.	

5.3 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.	10/31/2024
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan. If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring	10/31/2025

of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued. If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	

5.4 PFOS and PFOA Minimization Plan

This compliance schedule requires the permittee to achieve compliance by the Due Date.

Required Action	Due Date
Submit Progress Report #1: Submit an annual progress report. The annual progress report shall: Indicate which source reduction measures or activities in the approved PFOS and PFOA minimization plan have been implemented; Identify which suspected sources have been monitored; Include an analysis of trends in weekly, monthly and annual average PFOS and/or PFOA concentrations; and Include an analysis of how influent and effluent concentrations vary with time and with significant loadings of PFAS such as loads from industries or other sources into the collection system.	06/30/2027
Submit Progress Report #2 and Re-evaluation: Submit a progress report on the success in the implementation of the PFAS minimization plan. The report shall include a summary of all actions taken and analysis of trends in weekly, monthly, and annual average PFOA and/or PFOS effluent concentrations. If initial PMP actions were not successful enough to result in PFOA and/or PFOS reductions below the values in s. NR 102.04(8)(d)1., Wis. Adm. Code, the permittee shall submit an updated PMP with the permit application for reissuance. Based on facility and PMP specifics the permittee may be allowed up to 53 additional months after the permit expiration date to implement additional PMP actions before being required to install PFAS treatment technologies. This schedule may be modified to adjust compliance schedule dates to incorporate any changes in minimization plan goals and actions or as new information is made available to the department.	02/29/2028
Submit Progress Report #3: Submit the PFOS and PFOA minimization progress report as defined above.	09/30/2028
Submit Progress Report #4: Submit the PFOS and PFOA minimization progress report as defined above.	09/30/2029
Submit Progress Report #5: Submit the PFOS and PFOA minimization progress report as defined above.	09/30/2030
Submit Progress Report #6: Submit the PFOS and PFOA minimization progress report as defined above.	09/30/2031
Submit Final Progress Report and Re-evaluation: Submit a progress report on the success in the implementation of the PFOS and PFOA minimization plan. The report shall include a summary of all actions taken and analysis of trends in weekly, monthly, and annual average PFOS and/or PFOA effluent concentrations. If initial PMP actions were not successful enough to result in PFOS and/or PFOA reductions below the values in s. NR 102.04(8)(d)1., Wis. Adm. Code, the permittee shall be required to install PFAS	03/31/2032

treatment technologies to meet the calculated WQBELs.	
Submit Preliminary Engineering Report: The permittee shall submit a report outlining the various options for compliance with the applicable PFOS and/or PFOA WQBELs to the Department for review.	03/31/2033
Plan and Specification Submittal: The permittee shall submit final construction plans and specifications to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to achieve compliance with the applicable PFOS and/or PFOA WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below.	03/31/2034
Treatment Plant Upgrade to Meet Limitations: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of final constructions plans and schedule from the Department pursuant to s. 281.41, Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans/specifications and schedule by the Department, the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	03/31/2035
Complete Construction: The permittee shall complete construction of the wastewater treatment plant upgrades.	03/31/2036
Achieve Compliance: The permittee shall achieve compliance with the PFOS water quality-based effluent limit of 8 ng/L as a monthly average.	04/30/2036

5.5 Explanation of Schedules

The mercury PMP schedule is included to ensure the facility continues to take steps to address mercury in their effluent.

The service water use schedule is included for the facility to report any service water used that discharges to the ground. If a significant amount of data is gathered, changes may be made to the monitoring requirements at sample point 101.

PFAS/PFOA schedule is include because of NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. S. NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge. If the Department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

The department has made the determination that this facility has reasonable potential to cause or contribute to an exceedance of the PFOS standard in s. NR 102.04(8)(d)1., Wis. Adm. Code, based on the reasonable potential procedures and data collected under s. NR 106.98, Wis. Adm. Code. Pursuant to s. NR 106.985(1), Wis. Adm. Code, the department notified the permittee on 11/21/2025 of the requirement to develop a PFOS and PFOA Minimization Plan that satisfies the requirements in s. NR 106.99, Wis. Adm. Code. The permittee submitted a minimization plan on 2/18/2026; this plan was approved by the department on 03/02/2026.

The permittee is allowed up to 85 months to implement the minimization plan as outlined above. This schedule may be modified as more data is collected and the success of the proposed minimization plan is further evaluated. The permittee is required to submit annual progress reports every year, with a third progress report required to be submitted with the permit application. If necessary, a final progress report is required at the end of the next permit term.

If the minimization plan actions have not been successful enough to no longer have reasonable potential to cause or contribute to an exceedance of the applicable PFOS standards, then the permittee will be required to install a treatment system or otherwise take steps necessary to come into compliance with the applicable standard(s) by the final Due Date.

Special Reporting Requirements

None

Other Comments:

None

Attachments:

~~Water Quality Based Effluent Limits~~

PFOS and PFOA Water Quality-Based Effluent Limitations for the Wisconsin Public Service Corp – Fox Energy Center WPDES Permit No. WI-0061891 in Outagamie County, by Amy Garbe, PE, Wastewater Engineer, dated November 3, 2025

PFOS/PFOA Pollutant Minimization Program Plan, WPSC - Fox Energy Center, dated February 2026

Approval of PFOS Minimization Plan letter, by Nate Willis, PE, Wastewater Section Manager, dated 03/02/2026

Proposed Expiration Date:

June 30, 2028

Justification Of Any Waivers From Permit Application Requirements

Not applicable.

Prepared By:

Jonathan Hill Wastewater Engineer

Date: May 31, 2023

Revised By: Sarah Donoughe, Wastewater Specialist-Adv

Date: April 14, 2026

CORRESPONDENCE/MEMORANDUM

DATE: November 3, 2025

TO: Sarah Donoughe – NER

FROM: Kari Fleming – WY/3

SUBJECT: PFOS and PFOA Water Quality-Based Effluent Limitations for the Wisconsin Public Service Corp – Fox Energy Center WPDES Permit No. WI-0061891 in Outagamie County

This is in response to your request for an evaluation of the need for PFOS and PFOA limitations for the Wisconsin Public Service Corp – Fox Energy Center. This industrial facility discharges to the Lower Fox River, located in the Plum Creek-Fox River Watershed in the Lower Fox River Basin.

The current permit, effective since September 2023, has monitoring only for PFOS and PFOA for Outfall 001. The following review is based on new regulations which are now in effect throughout the state of Wisconsin and recommendations are made in accordance with chapters NR 102, 104, 105, 106, 207, and 217 of the Wisconsin Administrative Code, where applicable.

Receiving Water Information

- Name: Lower Fox River
- Classification: Warm Water Sport Fish (WWSF) community, non-public water supply. (Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.)
- Flow: The following low flow and harmonic mean values are from USGS for the Fox River at Wrightstown (Station 04084500) based on data from 1969 to 2013. The annual low flows used in previous evaluations were calculated by USGS in November 2010 so the updated low flows incorporate additional gauge data collected since this date. The gauge station is located 0.4 mi downstream of Outfall 001.
  - 7-Q10 = 916 cfs (cubic feet per second)
  - 7-Q2 = 1340 cfs
  - 90-Q10 = 1249 cfs
  - Harmonic Mean Flow = 3098 cfs
- % of Flow used to calculate limits: 25%

Effluent Information

- Flow rate(s): Outfall 001
  - Max Annual average = 0.814MGD (Million Gallons per Day)
  - Peak daily = 0.930 MGD
  - Peak weekly = 0.900 MGD
  - Peak monthly = 0.899 MGD

  For reference, the actual average flow from January 2023 through September 2025 was 0.771 MGD.

- Water source: The Fox Energy Center utilizes treated effluent from the Heart of the Valley Metropolitan Sewerage District (HOV) as the primary source of process water for facility operations rather than withdrawing surface water. Fox Energy collected samples of the influent received from HOV for both PFOS and PFOA. The following table lists the statistics for the source water PFOS and PFOA levels from September 2023 through October 2025.

	PFOS ng/L	PFOA ng/L
1-day P_{99}	32.78	32.03
4-day P_{99}	19.58	21.79
30-day P_{99}	12.92	16.51
Mean	9.91	13.9
Std	6.38	5.66
Sample Size	24	24
Range	3.0-25.6	6.2-27.9

- Effluent characterization: This facility is categorized as a primary industrial discharge

The following table lists the statistics for effluent PFOS and PFOA levels for Outfall 001 from March 2021 and September 2023 through October 2025.

	PFOS ng/L	PFOA ng/L
1-day P_{99}	204.03	134.07
4-day P_{99}	118.88	77.61
30-day P_{99}	51.06	48.99
Mean	22.8	36.3
Std	48.8	26.5
Sample Size	26	26
Range	2.0-257	6.7-149

Water Quality Based Limit – PFOS and PFOA
Administrative rules for PFOS and PFOA took effect on August 1, 2022. These rule revisions include additions to ch. NR 102 (s. NR 102.05), Wis. Adm. Code, which establish PFOS and PFOA standards for surface waters. Revisions to ch. NR 106 (s. NR 106, Subchapter VIII), Wis. Adm. Code establish procedures for determining water quality based effluent limits for PFOS and PFOA, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

PFOS
Due to PFOS being a bioaccumulating compound of concern (BCC), no mixing zone is allowed pursuant s. NR 106.98(4), Wis. Adm. Code. Therefore, the effluent limit for PFOS is set equal to criteria (8 ng/L).

PFOA
The conservation of mass equation is described in s. NR 106.06(4)(b)1., Wis. Adm. Code, and includes variables of water quality criterion (WQC), receiving water flow rate (Qs), effluent flow rate (Qe), and upstream PFOA concentrations (Cs) provided below.

$$\text{Limitation} = [(WQC)(Qs+(1-f)\,Qe) - (Qs-f\,Qe)\,(Cs)]/Qe$$

Where:

WQC = 95 ng/L for the Lower Fox River
Qs = 25% of the harmonic mean pursuant s. NR 106.06(4)(c)10., Wis. Adm. Code = 775 cfs
Cs = background concentration of PFOA in the receiving water pursuant to s. NR 106.06(4)(e), Wis. Adm. Code

Qe = effluent flow rate = 0.814 MGD = 1.26 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

After substituting the appropriate variables, the calculated PFOA limit is 58,514 ng/L.

Reasonable Potential Determination
In accordance with s. NR 106.98(4)(a), Wis. Adm. Code, **the discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion for PFOS** because the 30-day P_{99} of reported effluent PFOS data is greater than the calculated WQBEL (8 ng/L). Therefore, **a WQBEL is required for Outfall 001.**

The discharge does not have reasonable potential to cause or contribute to an exceedance of the water quality criterion for PFOA because the 30-day P_{99} of reported effluent PFOA data is less than the calculated WQBEL (58,514 ng/L). Therefore, **a WQBEL is not required.**

Conclusions
The following is a summary of limits recommended by this evaluation:

- Monthly average PFOS limit of 8 ng/L

If there are any questions or comments on these recommendations, please contact Amy Garbe by telephone at (608) 716-9968 or by email at Amy.Garbe@wisconsin.gov.

Attachments (2) – P99 Calculations

PREPARED BY: _____ date: 11/3/25
Amy Garbe, P.E., Wastewater Engineer

cc: Barti Oumarou , Basin Engineer – NER/Oshkosh
Nate Willis, P.E., PFAS Implementation Coordinator – CO

Attachment 1 – PFOS P99 Calculation

EFFLUENT VARIABILITY ANALYSIS -				
=	= =	=	=	
SUBSTANCE:				
NUMBER OF VALUES:	------			
TOTAL	26			
DETECTED	26			
NON-DETECTED				
d	0			
m	22.80385			
mean of all data	22.80385			
s	48.80898			
	------	------	------	
n	1	4	30	
d^n	0	0	0	
p	0.99	0.99	0.99	
Z_p	2.326785	2.326785	2.326785	
1+(s/m)^2	5.581242	5.581242	5.581242	
(sigma_d)^2	1.719411	1.719411	1.719411	
mu_d	2.267224	2.267224	2.267224	
(sigma_dn)^2	1.719411	0.763284	0.142114	
mu_dn	2.267224	2.745287	3.055872	
P_99 exponent	5.318252	4.77811	3.933024	
	-------	-------	-------	
P_99	204.03	118.88	51.06	
	-------	-------	-------	

Data Summary	
Mar-21	14.4
Sep-23	6.4
Oct-23	30.7
Nov-23	27.4
Dec-23	16.1
Jan-24	11.3
Feb-24	9.7
Mar-24	9.5
Apr-24	22.3
May-24	9.2
Jun-24	11.6
Jul-24	49.9
Aug-24	20.2
Sep-24	9.5
Oct-24	10.6
Nov-24	8.6
Dec-24	8.8
Jan-25	11.4
Feb-25	6.3
Mar-25	3.5
May-25	257
Jun-25	2
Jul-25	8.3
Aug-25	6.4
Sep-25	8.2
Oct-25	13.6

Attachment 2 – PFOA P99 Calculation

EFFLUENT VARIABILITY ANALYSIS -			
=	= =	=	=
SUBSTANCE:			
NUMBER OF VALUES:	------		
TOTAL	26		
DETECTED	26		
NON-DETECTED	0		
d	0		
m	36.30385		
mean of all data	36.30385		
s	26.48167		
	------	------	------
n	1	4	30
d^n	0	0	0
p	0.99	0.99	0.99
Z_p	2.326785	2.326785	2.326785
1+(s/m)^2	1.53209	1.53209	1.53209
(sigma_d)^2	0.426633	0.426633	0.426633
mu_d	3.378607	3.378607	3.378607
(sigma_dn)^2	0.426633	0.124889	0.017581
mu_dn	3.378607	3.529479	3.583133
P_99 exponent	4.898397	4.351757	3.891649
	-------	-------	-------
P_99	134.07	77.61	48.99
	-------	-------	-------

Data Summary	
Mar-21	35.3
Sep-23	18.7
Oct-23	69.6
Nov-23	42.9
Dec-23	49.4
Jan-24	27.8
Feb-24	22.2
Mar-24	22.8
Apr-24	53.4
May-24	23.8
Jun-24	37.8
Jul-24	41.6
Aug-24	45.2
Sep-24	30.5
Oct-24	30.6
Nov-24	30.9
Dec-24	25.2
Jan-25	26.5
Feb-25	29.8
Mar-25	17.1
May-25	149
Jun-25	6.7
Jul-25	21
Aug-25	18
Sep-25	32.7
Oct-25	35.4

Wisconsin Public Service Corporation
P.O. Box 19001
Green Bay, WI 54307-9001
www.wisconsinpublicservice.com

February 18, 2026
Mr. Barti Oumarou
Wisconsin Department of Natural Resources
625 E County Road Y
Suite 700
Oshkosh, WI 54901-9731

RE: Fox Energy Center – PFOS/PFOA Pollutant Minimization Plan

Dear Mr. Oumarou,

As part of the of the Wisconsin Pollutant Discharge Elimination System Permit (WPDES Permit No WI-0061891-04) for the WPS Fox Energy Center, the facility is conducting monitoring for two PFAS compounds in the plant discharge: perflourooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). On October 24, 2025, WPS submitted a request for determination of need for a PFOS/PFOA Minimization Plan. In a letter dated November 21, 2025, the Department determined there is a reasonable potential for the facility to discharge PFOS above the narrative standard for PFOS and that a PFOS/PFOA minimization plan is required.

Enclosed please find a proposed PFOS/PFOA pollutant minimization plan for the Fox Energy Center for Department review and approval. Should you have questions or need additional information, please feel free to me at (920) 433-1833 or via email at mark.metcalf@wecenergygroup.com.

Sincerely,

Mark Metcalf

Mark Metcalf
Principal Environmental Consultant

PFOS/PFOA Pollutant Minimization Program Plan

WPSC - Fox Energy Center

WPDES Permit No. WI-0061891-04-0

February 2026

PFOS/PFOA Pollutant Minimization Plan
Fox Energy Center
February 2026

Purpose

The purpose of this plan is to describe how Wisconsin Public Service Corporation (WPSC) will implement a Pollutant Minimization Program Plan (PMP) for poly- and perfluoroalkyl substances (PFAS) to comply with the requirements in s. NR 106.99, Wis. Adm. Code, and the Wisconsin Pollutant Discharge Elimination System (WPDES) Permit issued to the Fox Energy Center. This PMP is anticipated to be implemented with the issuance of a modified WPDES permit and updated with subsequent WPDES permit reissuances.

Background

The Fox Energy Center (FEC) is a natural gas-fired combined-cycle power generating facility with two combustion turbines and associated electric generators. The two combustion turbines exhaust hot gases to a heat recovery steam generator and steam turbine to produce additional power. The facility is capable of generating approximately 650 MW of electricity under peak conditions. A mechanical draft, wet cooling tower is used to condense the low pressure, low temperature steam after the heat recovery steam generator. Operation of the generating units at the Fox Energy Center fluctuates depending on market conditions and consumer demand.

The Fox Energy Center utilizes treated effluent from the Heart of the Valley Metropolitan Sewerage District (HOV) as the primary source of process water for facility operations rather than withdrawing surface water. Treated effluent from HOV receives additional treatment at the Fox Energy Center through a lime softening clarification system. Clarified water used for recirculating cooling water is sent to a water storage pond to be used as makeup water in the cooling tower. Some of the water receives further treatment through multimedia filters, demineralizers and reverse osmosis for use in plant processes, such as boiler water makeup. In 2025, WPS installed a high capacity well as a backup water supply in the event the supply line from HOV is insufficient or unavailable. Wastewater generated at the facility is discharged to the lower Fox River in Outagamie County.

On August 1, 2022, the Wisconsin Department of Natural Resources (WDNR) established new water quality criterion for two poly- and perfluoroalkyl substances (PFAS): perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). For PFOS, the water quality criterion for surface waters was established at 8 ng/L. For surface waters that do not supply public drinking water, the water quality criterion for PFOA is 95 ng/L. Pursuant to s. NR 106.98(2), Condition 3.2.1 of the permit included monitoring for PFOS and PFOA for a period of 2 years. After the two year monitoring period the permit-required submittal of the monitoring data obtained during the initial monitoring period for a Minimization Plan Determination of Need.

A "PFOS/PFOA Minimization Plan Determination of Need" compliance report was submitted to the WDNR on October 24, 2025. As part of this report, the permit required reporting concentrations of

PFOS/PFOA Pollutant Minimization Plan
Fox Energy Center
February 2026

PFOS and PFOA, an analysis of data trends, and a comparison of the results to the applicable narrative standard in s. NR 102.04 (8)(d), Wis. Adm. Code. In a letter dated November 21, 2025, WDNR determined that analysis of the monitoring data provided indicates there is a reasonable potential for the facility to discharge PFOS above the narrative standard in s. NR 102.04 (8)(d), Wis. Adm. Code. As a result, the facility is required to develop and implement a Pollutant Minimization Plan.

While the emphasis of the plan is to minimize the concentration of PFOS present in the plant discharge it is assumed through the implementation of this plan that a reduction in PFOS will also result in a reduction in PFOA and other PFAS compounds.

Current Operation - Water Treatment & Discharge

The Fox Energy Center beneficially reuses treated effluent from HOV as the source water for the facility. WPS is authorized to receive up to 5.34 million gallons per day (MGD) of water from HOV and discharges approximately 0.9 MGD to the Fox River. Prior to use at the facility, the water is treated in a clarification system that utilizes a cold lime softening process to further remove pollutants in the water received. Treatment of the water serves as a means of removing contaminants. The clarification system introduces lime, ferric chloride and polymer to create a low solubility precipitate that is removed through a sludge wasting and dewatering process.

After the cold lime softening process, the clarified water goes to storage in a 5 million gallon, on-site service water storage pond. The clarified water is used to replace water lost from the condenser cooling system due to blowdown and evaporation from the cooling tower. As water evaporates from the cooling tower, the dissolved solids concentration increases in the recirculated cooling water system. When needed to control dissolved solids concentrations, the facility discharges a portion of the cooling system water to the Fox River.

Clarified water receives additional treatment through multi-media filters for use in service and fire water systems. Service water is further treated via reverse osmosis and Mixed Bed ion exchange to make demineralized water for use in the boilers or combustion turbine air inlet cooling system. The reverse osmosis reject water and the filter backwash are typically returned to the intake water lime softening clarifier for solids removal and water reuse. Boiler blowdown is cooled and routed to the recirculating cooling system, while small amounts of service water from floor and sink drains and groundwater seepage into underground vaults are directed to an oil/water separator before being directed to the cooling tower basin and mixed with recirculating cooling water.

PFAS Reduction Activities Previously Implemented

PFAS compounds are known to have been used in some firefighting foams, including aqueous film forming foam (AFFF). In 2020, WPSC investigated whether PFAS containing chemicals were present at the facility. Through the investigation it was determined that the fire suppression systems for the fuel oil storage tanks and steam turbine generator (STG) building used AFFF containing PFAS. Upon

discovery that PFAS foam was present at the facility, floor drains in the buildings with the fire suppression systems were blocked to prevent an accidental release of foam into floor drains and subsequently the oil/water separator and cooling water system.

The foam system associated with the fuel oil storage tanks was removed in October 2020. In October 2023, WPS removed the STG building foam system, product, storage tanks, and portions of the fire suppression system that were exposed to the firefighting foam. This action resulted in the removal of approximately 1,000-gallons of AFFF foam concentrate from the facility. As part of this decommissioning effort, water samples from the fire suppression system were collected to evaluate whether the sprinkler distribution piping was contaminated with foam. A review of the sampling results concluded that the STG building foam system distribution piping was not likely exposed to AFFF foam.

PFAS Source Identification and Inventory

Two main sources could directly contribute PFAS to the wastewater discharge from the facility: PFAS present in the process wastewater received from the HOV and PFAS introduced through chemical additives and water treatment.

Cooling and Process Water

As required by the WPDES permit, WPS monitored the effluent from the facility for PFOA and PFOS during the first two years of the WPDES permit. In addition to monitoring the discharge, samples were also collected from the treated effluent received from HOV. This monitoring has shown both PFOS and PFOA are present in the treated effluent received from HOV for process water use at FEC. The monitoring data shows the concentration of PFOS in the water obtained from HOV has varied between 3.0 ng/L and 25.6 ng/L. The concentrations in the water from HOV fluctuate with no obvious seasonal trend. Concentrations of PFOS at Outfall 001 have been comparable to that of the intake. At this time the water received from HOV is believed to be the primary source of PFAS compounds at the facility. WPS will continue to monitor the influent from HOV at the same monitoring frequency required at Outfall 001.

Chemical Additives

There are no known sources of PFOS/PFOA in chemical additives used at the site. During the first year of the PMP implementation, WPS will review the safety data sheets of the process chemicals used in the water treatment and water quality additives at the facility to verify whether the products contain PFOS/PFOA. If a product is found to contain PFOS/PFOA, WPS will investigate finding a suitable alternative. New boiler water and process chemicals proposed for use at the plant will be reviewed for the presence of PFAS prior to submittal to WDNR for use at the facility.

As the chemical manufacturer periodically updates safety data sheets, WPS will review safety data sheets for the boiler water and process chemical additives used at the site on an annual basis. This process is a proactive tool to monitor chemicals purchased for the presence of PFAS.

Additional Monitoring

In November 2024 WPS collected samples at varying locations at the facility in conjunction with collecting samples of the influent and discharge from the facility. The purpose of the additional sampling was to evaluate the concentration of PFOS/PFOA at various locations in an attempt to identify if there are additional sources that contribute flow to the cooling tower basin that may contain PFAS prior to being discharged. The additional sampling locations, along with the observed PFOS/PFOA concentrations, are shown in Table 1:

Table 1: Additional Monitoring Location Data

Location	PFOA (ng/L)	PFOS (ng/L)
HOV Influent	13.8	8.1
Outfall 001	9.3	2.3
Clarifier discharge	9.4	10.1
Cooling tower makeup water	15.5	13.1
Heat Recovery Steam Generator (HRSG) discharge	8.1	6.0
Oil/Water separator discharge	82.5	14.9
High capacity well water	<0.28	<0.54

On the day of the sampling, the influent from HOV, clarifier treatment discharge, and cooling tower makeup water have very similar concentrations of PFOA and PFOS. The water utilized in the HRSG is treated influent that goes through a demineralizer system and reverse osmosis system for additional treatment. While PFOA and PFOS compounds were present, the HRSG discharge water does not appear to be a significant source of the pollutants.

Discharge from the oil/water separator, which receives flow from the various sumps and drains across the facility, showed an elevated concentration of PFOA and slightly higher concentrations of PFOS. This suggests there may be a source contributing PFAS compounds to the cooling tower basin and the plant discharge. During the first year of the PMP, WPS will collect samples of the oil/water separator discharge on a quarterly basis to estimate the amount of PFOS being contributed to the plant discharge. If elevated levels of PFOS above the background levels observed in the HOV influent are noted, WPS will collect samples from wastewater streams contributing flow to the oil/water separator in an effort to determine the water source(s) contributing PFOS. If discharge from the oil/water separator is not determined to be a significant source of PFOS, the monitoring frequency may be reduced.

Improvement in Operational Controls or Maintenance

Another potential source that could contribute PFAS to the plant discharge are lubricating greases and oils utilized at the facility. PFAS are found in fluorinated greases and oils. While oil is not added directly to wastewater, it may be present due to drips, leaks or spills that occur. Utilization of an oil/water

separator is a useful tool to mitigate oil from being present in the plant discharge; however, an active inspection and maintenance program to prevent oil from entering the wastewater treatment system is the best practice. In year 2 of the plan, WPS will review safety data sheets for lubricating oils and grease used at the facility to determine if PFAS compounds are reported or are likely to be present. If PFAS containing oil is noted, then WPS will evaluate options to mitigate PFAS from lubricating oils being released to the cooling tower basin. This may include such as the use of an alternative lubricating oil that does not contain PFAS, increased oil/water separator cleanout, the installation of spill controls or containment near equipment, or the installation of additional wastewater treatment capabilities for PFAS removal.

Cleanup of Historical Contamination

PFAS compounds are known to be present in the water received from HOV; therefore, the compounds are present in the tanks, piping, and process equipment throughout the facility. Therefore, cleaning or replacing all of the piping, tanks, etc. is not a cost effective or feasible alternative to addressing PFAS.

As noted above, WPS is aware that PFAS containing firefighting foam was present at the facility. WPS researched the operation of the fire suppression system and concluded that the system had not actuated in the past. However, it is not known if leaks or spills from the system may have occurred over the life of the system. As the fire suppression systems are located within buildings it is possible a leak or spill from the system could have entered a floor drain. During the first year of the PMP, WPS will review drawings to identify the drains, piping and sumps that have the highest potential to have been impacted by a leak or spill from the fire protection systems. In year 2, WPS will evaluate appropriate options to address the potential for contamination in the piping, including, but not limited to, flushing, slip lining, chemical or mechanical cleaning, or plugging/abandonment. In year 3, WPS will implement the selected corrective action(s).

Institution of Alternative Processes

The facility currently utilizes two technologies for treatment of process water: the cold lime clarification system to treat the water received from HOV and an oil/water separator for treatment of low volume wastewater. These technologies are not specifically designed to remove PFAS compounds. There are few technologies proven to reduce PFAS compounds, such as reverse osmosis (RO), granular activated carbon (GAC), and ion exchange resins. Implementation of one of these technologies to treat the influent from HOV is not economically feasible. Through the implementation of the PMP, WPS will evaluate whether the installation of one of these treatment systems in conjunction with the oil/water separator is a feasible and cost effective tool for the removal of PFAS. An evaluation of alternative wastewater treatment processes will occur in Year 3 of the PMP following source identification and additional source monitoring activities.

PFOS/PFOA Pollutant Minimization Plan
Fox Energy Center
February 2026

Plan Implementation and Efficacy Documentation

WPSC will review the PMP on an annual basis. The review will be used to document implementation and evaluate progress of the PMP at reducing PFAS in the facility's discharge. Actions taken during the previous year will be reviewed and summarized. The review will include a summary of PFOS concentrations and comparison of the results to historical data in graphical and tabular form. In addition, PFOS mass calculations will be performed to estimate the mass of the pollutants in the influent to the facility compared to the effluent from the facility will be utilized to measure the effectiveness of the PFOS minimization plan.

Annual Review

WPSC will provide information on the progress of the PMP reduction efforts in Annual Status Reports to the Department as required by the WPDES permit.

Summary of PMP Activities

PMP Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Monitoring – Intake and effluent (Monthly)	X	X	X	X	X
Monitoring – Oil/Water Separator (Quarterly)	X				
Chemical Additive - SDS review	X	X	X	X	X
Lubricating Oils & Greases – SDS Review		X			
Drain and Piping Diagram Review	X				
Evaluate options to address potential contamination in drain piping where PFAS foam was stored.		X			
Implement Piping corrective action			X		
Evaluation of alternative wastewater treatment methods			X		
PMP Status Report	X	X	X	X	X

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
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Tony Evers, Governor
Karen Hyun, Ph.D., Secretary
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03/02/2026

Kyle Hoops, Senior VP Power Generation
Wisconsin Public Service Corp – Fox Energy Center
310 E Frontage Rd
Kaukauna, WI 54130-9674

Subject: Approval of PFOS Minimization Plan

Dear Kyle Hoops:

The Wisconsin Department of Natural Resources (hereafter department) is conditionally approving the PFOS minimization plan (PMP) for the Wisconsin Public Service Corp – Fox Energy Center (FEC) facility in Kaukauna, Wisconsin, received for approval on 02/18/2026.

The FEC does not intentionally add or use PFOS or other PFAS compounds in the operating or treatment processes at the facility, but two years of effluent sampling data shows reasonable potential to exceed the calculated water quality-based effluent limit for PFOS (8 ng/L). The FEC utilizes treated effluent from the Heart of the Valley Metropolitan Sewerage District as the primary source of process water for facility operations rather than withdrawing surface water. In 2025, a high capacity well was installed as a backup water supply in the event the supply line from the Heart of the Valley is insufficient or unavailable.

To date, investigations into potential PFAS inputs into the facility have already commenced. In 2023, the steam turbine generator building foam system and portions of the fire suppression system that were exposed to firefighting foam were removed. In addition to the monthly ongoing effluent PFOS monitoring, the FEC has sampled the treated effluent from Heart of the Valley, showing that both PFOS and PFOA are present, with PFOS concentrations varying from 3.0 – 25.6 ng/L. While this is anticipated to be the primary source of PFAS which is ultimately discharged, the FEC is also proposing to continue sampling at different internal points to determine additional inputs.

The PMP is hereby approved in accordance with s. 283.31, Wis. Stats. and s. NR 106.985(2)(a), Wis. Adm. Code, subject to the following conditions:

1. That if modifications to the approved PMP are necessary, a revised PMP shall be submitted to the department for its approval prior to commencement of the modifications.
2. That the PMP be followed in accordance with the requirements of WPDES Permit No. WI-0061891-04-0 and subsequent approved modifications to the PMP and the permit.

Per s. NR 106.985(2)(b), Wis. Adm. Code, the department will modify the FEC WPDES permit to include the PFOS minimization plan, and other related terms and conditions, including annual progress reporting requirements and a schedule of compliance to meet applicable water quality based effluent limitations. As part of the modification, the approved PMP will be available for public comment as part of the public noticed package.

This conditional approval is not to be construed as a department determination on the issuance of a WPDES permit or an opinion as to the ability of the proposed PMP to comply with effluent limitations in such a permit. Also, this letter is not to be construed as an approval for activities requiring approval under other Wisconsin administrative codes or statutes or by other federal, state or local agencies.

If you believe you have a right to challenge this decision, the Wisconsin statutes and administrative codes establish time periods which requests to review department decisions must be filed. For judicial review of a decision pursuant to ss. 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the department, to file your petition with the appropriate circuit court and serve the petition on the department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to s. 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. All requests for contested case hearings must be made in accordance with s. NR 2.05(5), Wis. Adm. Code, and served on the Secretary in accordance with s. NR 2.03, Wis. Adm. Code. The filing of a request for a contested case hearing does not extend the 30-day period for filing a petition for judicial review. The filing of a request for a contested case hearing is not prerequisite for judicial review.

Please contact Nate Willis by phone (608) 535-2369 or email: nathaniel.willis@wisconsin.gov if you have any questions regarding this letter.

Digitally signed by Nate Willis, P.E.
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Nate Willis, P.E.
Wastewater Section Manager
Bureau of Water Quality

e-cc: Mark Metcalf - WPSC
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