

# Permit Fact Sheet

## General Information

Permit Number:	WI-0001571-10-0
Permittee Name:	Kewaunee Solutions, Inc.
Address:	N490 State Highway 42
City/State/Zip:	Kewaunee WI 54216-9511
Discharge Location:	Shore of Lake Michigan directly east of the facility (44°20'33.0"N 87°32'02.0"W)
Receiving Water:	Lake Michigan
StreamFlow (Q <sub>7,10</sub> ):	N/A
Stream Classification:	Cold Water, Public Water Supply
Discharge Type:	Existing

## Facility Description

Kewaunee Solutions operates a decommissioned nuclear-fueled steam electric power plant which was permanently shut down in May 2013.

About 300,000 gallons of reactor segmentation water is scheduled to be discharged to Outfall 001 over the course of approximately two weeks in 2027 which will be required to meet Nuclear Regulatory Commission (NRC) requirements. High purity deionized water will be trucked to the facility and used for component cleanup and reactor cavity shielding during disassembly. Hydrogen peroxide may be utilized to protect employees from radioactive material. Continual filtering will also be utilized while the water remains in place during the several years of reactor disassembly. Sodium hydroxide and sulfuric acid may also be used if it's necessary to adjust pH. Before the reactor segmentation water is discharged, it will be processed through mechanical filters, carbon filters, and resin beds.

This permit does not include numeric limits on radioactivity because applicable NRC regulations include restrictions on the amount of radionuclides in the discharge.

Changes from previous permit have been highlighted in grey.

## Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, and a site visit on **8/14/2023**, this facility has been found to be in substantial compliance with their current permit.

**Compliance determination entered by David Haas, Wastewater Specialist on September 19, 2023.**

<b>Sample Point Designation</b>		
<b>Sample Point Number</b>	<b>Discharge Flow, Units, and Averaging Period</b>	<b>Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)</b>
701	Maximum Day: 107 MGD <sup>1</sup>	INTAKE: Intake water sampling point for offshore intake in Lake Michigan
001	Maximum Day: 28.8 MGD <sup>2</sup> Maximum 7-Day Average: 28.8 MGD <sup>2</sup> Maximum 30-Day Average: 28.8 MGD <sup>2</sup> Maximum Annual Average: 28.8 MGD <sup>2</sup>	EFFLUENT: Process wastewater sampled prior to discharge to Lake Michigan
108	N/A	BLANK: Mercury Field Blank.

## **Changes from Previous Permit:**

Sample Points 005, 102, 103, 104, 702 – Sample points removed

## **Explanation of Changes from Previous Permit:**

### **Sample Point 103 and 005**

These sample points have been removed due to the service water lagoons having been abandoned and turned into a wildlife habitat.

### **Sample Points 104 and 102**

Nothing will be discharged through sample points 104 and 102 anymore and the building containing this sample point will be demolished before the end of this permit term and therefore this sample point has been removed.

### **Sample Point 702**

The requirements for sample point 702 have been moved to sample point 701 in order to make the permit more concise.

## **1 Influent – Monitoring Requirements**

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<sup>1</sup> Calculated based on the maximum flow rate that would give the facility a maximum design velocity of 0.5 fps

<sup>2</sup> Data is a future estimate submitted on “Wisconsin Pollutant Discharge Elimination System (WPDES) Wastewater Discharge Individual Permit Application” (Form 3400-178) by Kewaunee Solutions, Inc.

## Sample Point Number: 701- Intake Water

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate	Daily Maximum	107 MGD	Daily	Continuous	Monitoring only required when flow occurs
Arsenic, Total Recoverable		ug/L	Quarterly	Grab	Only required for the first year of the permit term

### Changes from Previous Permit:

**Flow Rate** – Daily maximum limit added

**Arsenic** – Quarterly monitoring added for the first year of the permit term

**Water Intake Structure (WIS):** The influent section includes the WIS description, authorization for use, and BTA (Best Technology Available) determination. The permittee is authorized to use the water intake structure which consists of the following:

- Location: Approximately 1,600 ft offshore of Lake Michigan at a depth of 15 ft. ( Lat/Long: 44°20'39" W 87°31'42" N)
- Source Waterbody Information: Lake Michigan is 118 miles wide and 307 miles long at its maximum. The average depth is 279 ft with a maximum depth of 925 ft and a total volume of 1,180 cubic miles. The depth at the intake is 15 ft. At this depth thermoclines do not form as the lake thermoclines form at depths of 30 to 50 ft.
- Major Components: Three vertical 22 ft diameter intakes with trash grilles 2 ft by 2 ft, two auxiliary intakes that have a 30 in opening rising vertically to 1 ft above the lake bottom, and four 10 ft by 36 ft long screens with a mesh size of 3/8 in.
- Maximum Design Intake Flow (DIF): 107 MGD
- Percent Used for Cooling: 0%

### Explanation of Limits and Monitoring Requirements

#### Water Intake Structure:

Since none of the water withdrawn through the MPU North Dock is used for cooling, the facility is exempt from the requirements of ch. NR 111, Wis. Adm. Code. In lieu of these requirements, under s. NR 283.31(6), Wis. Stats., a best professional judgment BTA determinations was made using the Department's 2020 *Guidance for Evaluating Intake Structures Using Best Professional Judgment*. For existing intake structures, the guidance advises that intakes deemed BTA should fulfill at least one of the following eight criteria:

- **Each water intake structure has a maximum design intake velocity of 0.5 feet per second (fps) OR a maximum actual intake velocity of 0.5 fps, demonstrated via measured or calculated values which show the maximum intake velocity as water passes through the intake system, measured perpendicular to the opening, does not exceed 0.5 fps at any point up until the first screen of mesh size 3/8" (or equivalent) or less. (The WIS has a maximum design velocity of 0.5 fps)**
- The facility operates a closed-cycle recirculating system that only requires make-up water with > 3 cycles of concentration on at least a daily basis. Cycles of concentration can be measured as the ratio of chloride levels in the recirculated water or blowdown relative to the chloride levels in the source water, or makeup water; or the make-up water volume divided by the blowdown volume (provided there aren't other water losses); or the blowdown water conductivity divided by the make-up water conductivity.

- The facility operates an intake structure that minimizes impingement rates by nature of its location (e.g. offshore velocity cap).
- The facility employs a system of technologies (e.g. wedge-wire screens, barrier nets; acoustic, light, or pH deterrent systems; variable speed pumps, etc.) that minimize impingement mortality rates.
- The facility operates a modified traveling screen in an optimal manner that does not promote re-impingement or predation of returned organisms.
- **The facility's intake withdraws water at > 0.25 fps less than or equal to 16% of the time. (The facility plans to withdraw water for less than a month over the permit term)**
- There is data indicating that the impingement mortality rate has been/will be reduced 80-95% compared to a once-through cooling system with 3/8" traveling screens;
- There is biological data that affirmatively demonstrates that: 1) the source water body does not include threatened or endangered species in the vicinity of the intake, and 2) there are no aquatic life and water quality problems partly or solely due to the presence or operation of the intake structure.

And at least one of the following five criteria:

- **The total water withdrawn (actual intake flow) is  $\leq$  5% of the mean annual flow of the river on which the intake is located (if on a river or stream) OR the total quantity of the water withdrawn is restricted to a level necessary to maintain the natural thermal stratification or turnover patterns (where present) except in cases where the disruption is beneficial (if on a lake or reservoir)**
- The facility operates at < 8% capacity utilization rate (with pumps turned off or, if variable frequency drives exist, down substantially during periods of non-operation) or at full capacity only for portions of days during a few months or less on an annual basis. If located in a spawning area, the period of water intake operation should not correspond with times when spawning, peak egg/larval abundance, or larval recruitment is occurring (depending on species present, usually between April – October).
- The facility operates a closed-cycle recirculating system that only requires make-up water with  $\geq$  3 cycles of concentration on at least a daily basis. Cycles of concentration can be measured as the ratio of chloride levels in the recirculated water or blowdown relative to the chloride levels in the source water, or makeup water; or the make-up water volume divided by the blowdown volume (provided there aren't other water losses); or the blowdown water conductivity divided by the make-up water conductivity.
- The facility utilizes other means such as variable speed pumps, unit retirements, etc. to decrease entrainment rates by greater than or equal to 60% compared to a once-through cooling system with 3/8" traveling screens. Flow rate may be used as a surrogate for entrainment rates when determining percent reduction.
- There is biological data that affirmatively demonstrates that: 1) the source water body does not include threatened or endangered species in the vicinity of the intake, 2) there are no aquatic life and water quality problems partly or solely due to the presence or operation of the intake structure, and 3) the department biologist concurs that operation of the intake during periods of spawning, peak egg/larval abundance, and larval recruitment will not substantially impact populations or prey bases for the fishery.

And the following criterion:

- **The facility-wide design intake flow (DIF) for all water intake structures is  $\leq$  2 MGD (all intake water, cooling and non-cooling, is included in the determination of whether this DIF threshold is met) OR < 25% of the total water withdrawn is used exclusively for cooling purposes (water from a public water system, treated effluents, process water, gray water, wastewater, reclaimed water, or water used in a manufacturing process before or after it is used for cooling is not considered cooling water for the purposes of this determination) (The facility uses less than 25% of the water withdrawn exclusively for cooling purposes)**

The facility meets the bolded criteria above, so the department has concluded that the existing WIS is considered BTA for minimizing entrainment and impingement mortality.

### Flow Rate

A flow rate limit was included in this reissuance in order to ensure that the maximum intake velocity remains at 0.5 feet per second or less.

### Intake Screen Discharges and Removed Substances

Floating debris and accumulated trash collected on the water intake trash rack shall be removed and disposed of in a manner to prevent any pollutant from the material from entering the waters of the State pursuant to s. NR 205.07 (3) (a), Wis. Adm. Code.

### Endangered Species Act

This permit does not authorize take of threatened or endangered species. Contact the state Natural Heritage Inventory (NHI) staff with inquiries regarding incidental take of state-listed threatened and endangered species and the US Fish and Wildlife Service with inquiries regarding incidental take of federally-listed threatened and endangered species.

### Arsenic

There is monitoring at the outfall to determine if there is reasonable potential to exceed the calculated arsenic limits. It is known that arsenic levels in Lake Michigan (and possibly wells in the area) exceed the human cancer criteria, so parallel monitoring of arsenic in the effluent and source well water is requested.

## 2 Inplant - Monitoring and Limitations

### Sample Point Number: 108- Mercury Field Blank

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Mercury, Total Recoverable		ng/L	Quarterly	Grab	

### Changes from Previous Permit:

The department has determined that no changes are needed

### Explanation of Limits and Monitoring Requirements

#### Mercury

The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, effluent, or other samples all collected on the same day) as required by NR 106.145 Wis. Adm. Code.

## 3 Surface Water - Monitoring and Limitations

### Sample Point Number: 001- Process Wastewater

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Monthly	Estimated	
Phosphorus, Total	6-Month Avg	0.6 mg/L	Monthly	Grab	Monitoring only required in months where flow occurs

<b>Monitoring Requirements and Limitations</b>					
<b>Parameter</b>	<b>Limit Type</b>	<b>Limit and Units</b>	<b>Sample Frequency</b>	<b>Sample Type</b>	<b>Notes</b>
Arsenic, Total Recoverable		ug/L	Quarterly	Grab	Monitoring only required in the quarters where flow occurs
Mercury, Total Recoverable		ng/L	Quarterly	Grab	Monitoring only required in the quarters where flow occurs
pH (Maximum)	Daily Max	9.0 su	Monthly	Grab	Monitoring only required in months where flow occurs
pH (Minimum)	Daily Min	6.0 su	Monthly	Grab	Monitoring only required in months where flow occurs
Boron, Total Recoverable	Daily Max	18 mg/L	3/Week	Grab	Monitoring only required when discharge occurs.
Boron, Total Recoverable	Weekly Avg	11 mg/L	3/Week	Grab	Monitoring only required when discharge occurs.
Boron, Total Recoverable	Monthly Avg	11 mg/L	3/Week	Grab	Monitoring only required when discharge occurs.

## **Changes from Previous Permit**

**Acute WET and Temperature** – Parameters removed

**Boron** – Daily max, weekly average, and monthly average limits added

## **Explanation of Limits and Monitoring Requirements**

**Refer to the QBEL memo for the detailed calculations, prepared by the Water Quality Bureau dated 1/5/2024 and updated 3/13/2024 used for this reissuance.**

### **Phosphorus**

Phosphorus requirements are based on the Phosphorus Rules that became effective 12/1/2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. The code categorically limits industrial dischargers of more than 60 pounds of phosphorus per month to 1.0 mg/L unless an alternative limit is approved. NR 217 also specifies QBELs (water quality based effluent limits) for discharges of phosphorus to surface waters of the state from publicly and privately owned wastewater facilities, noncontact cooling water discharges which contain phosphorus, concentrated animal feeding operations that discharge through alternative treatment facilities and a facility/site that is regulated under NR 216 where the standards in NR 151 and 216 are not sufficient to meet phosphorus criteria. QBELs for phosphorus are needed whenever the discharge contains phosphorus at concentrations or loadings that will cause or contribute to an exceedance of the water quality standards.

### **Arsenic**

Discharge from this outfall is not anticipated to contain levels of arsenic above the calculated limits and therefore no limits for arsenic have been included in this reissuance.

### **Mercury**

Discharge from this outfall is not anticipated to contain levels of mercury above the calculated limits and therefore no limits for arsenic have been included in this reissuance.

**pH**

NR 290, Wis. Adm. Code, requires all discharges except for once through cooling water have a pH within the range of 6.0 to 9.0.

**Boron**

Discharge through this outfall will contain an unknown concentration of boric acid from the component cooling water heat exchanger. Since the concentration of boric acid is unknown reasonable potential could not be calculated and thus a limit for boron has been included as part of this reissuance.

**Temperature**

Temperature monitoring was included in the last reissuance in order to determine if there was reasonable potential for the facility to exceed the temperature WQBEL for Lake Michigan at 44°20'33.0"N 87°32'02.0"W. From the available data it was determined that this facility did not have reasonable potential to exceed the applicable WQBEL.

**Acute WET**

Based on the criteria listed in the WET checklist it was determined that this discharge has a low potential for effluent toxicity and therefore no Acute WET testing requirements are included in this reissuance.

## 4 Schedules

### 4.1 Wastewater Operator Certification

Required Action	Due Date
Obtain Subclass U Certification: Within 60 days of commencing operation of the treatment system the operator in charge must obtain the subclass u certification.	

### Explanation of Schedules

#### Wastewater Operator Certification

As part of the decommissioning processes at this facility a new treatment system is being installed. This treatment system will be unique and therefore will require a subclass U certified operator.

### Attachments:

Attachment #1: Water Quality Based Effluent Limits

### Expiration Date:

August 31, 2029

Prepared By: Sawyer Hanson, Wastewater Engineer

Date: [Enter Date](#)

Notice of reissuance was published in the Green Bay Press Gazette, 435 E Walnut Street, PO Box 23430, Green Bay, WI 54305.





**CORRESPONDENCE/MEMORANDUM**

DATE: 01/05/2024 – updated 03/13/2024 to add boron limit  
TO: Sawyer Hanson – WY/3  
FROM: Nicole Krueger – SER *Nicole Krueger*  
SUBJECT: Water Quality-Based Effluent Limitations for Kewaunee Solutions, Inc.  
WPDES Permit No. WI-0001571-10

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from Kewaunee Solutions, Inc. in Kewaunee County. This industrial facility discharges to Lake Michigan. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
Phosphorus					0.6 mg/L	2
pH	9.0 s.u.	6.0 s.u.				2
Arsenic						1
Mercury						1
Boron	18 µg/L		11 µg/L	<b>11 µg/L</b>		3

Footnotes:

1. Monitoring only.
2. No changes from the current permit.
3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, are included in bold.

No WET testing is required because information related to the discharge indicates low to no risk for toxicity.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at [Nicole.Krueger@wisconsin.gov](mailto:Nicole.Krueger@wisconsin.gov) or Diane Figiel at [Diane.Figiel@wisconsin.gov](mailto:Diane.Figiel@wisconsin.gov).

Attachments (3) – Narrative, Outfall Map, & Thermal Table

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

E-cc: Dave Haas, Wastewater Engineer – NER  
Heidi Schmitt Marquez, Regional Wastewater Supervisor – NER  
Diane Figiel, Water Resources Engineer – WY/3  
Nate Willis, Wastewater Engineer – WY/3



Attachment #1  
**Water Quality-Based Effluent Limitations for  
 Kewaunee Solutions, Inc.**

**WPDES Permit No. WI-0005171-10**

Prepared by: Nicole Krueger

**PART 1 – BACKGROUND INFORMATION**

**Facility Description**

Kewaunee Solutions operates a decommissioned nuclear-fueled steam electric power plant which was permanently shut down in May 2013.

Currently, the flows to Outfall 001 include rainwater and groundwater from the Turbine Building Sump (about 400 gallons, once per week). A cleaning agent DC-13 is sometimes used to remove potentially radioactive material. Some stormwater from roof drains is also discharged through Outfall 001 but is expected to decrease as buildings are demolished. Dust suppressant water will be used during demolition which is sourced from Lake Michigan.

About 300,000 gallons of reactor segmentation water is scheduled to be discharged to Outfall 001 over the course of two weeks in 2027 which will be required to meet Nuclear Regulatory Commission (NRC). High purity deionized water will be trucked to the facility and used for component cleanup and reactor cavity shielding during disassembly. Hydrogen peroxide may be utilized to protect employees from radioactive material. Continual filtering will also be utilized while the water remains in place during the several years of reactor disassembly. Sodium hydroxide and sulfuric acid may also be used if it's necessary to adjust pH. Before the reactor segmentation water is discharged, it will be processed through mechanical filters, carbon filters, and resin beds.

There are approximately 200 gallons of additional water from the Auxiliary Building tank system that will be diluted with the reactor segmentation water and discharged through Outfall 001. This water contains boric acid which was used several years ago for the component cooling water (CCW) heat exchanger. Boric acid is assumed to still be in these 200 gallons of water and not expected to be removed with filtration or resin beds. Other additives were previously used in the CCW (sodium nitrite, sodium tolyltriazole, sodium molybdate, glutaraldehyde, and sodium hydroxide) but these are likely to either have been completely degraded and/or will be removed with in the resin beds.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

**Existing Permit Limitations**

The current permit, expiring on 12/31/2023, includes the following effluent limitations and monitoring requirements.

**Outfall 001 – Process Wastewater**

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
Temperature						1

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Phosphorus					0.6 mg/L	
pH	9.0 s.u.	6.0 s.u.				2
Arsenic						1
Mercury						1
Acute WET						3

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. Acute WET testing is required once every other year.

**Receiving Water Information**

- Name: Lake Michigan
- Waterbody Identification Code (WBIC): 20
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Cold Water, Public Water Supply.
- Flow: A ten-to-one dilution ratio will be used for calculating effluent limitations based on chronic or long-term impacts, in accordance with s. NR 106.06(4)(b)2, Wis. Adm. Code, because the receiving water does not exhibit a unidirectional flow at the point of discharge.
- Hardness = 138 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of data from chronic WET testing from 07/16/2013 – 09/13/2016.
- Source of background concentration data: Arsenic and mercury data is from the intake water sampling points (701 and 702) which were previously used. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: There are several other dischargers to Lake Michigan, however they are not in the immediate vicinity and the mixing zones do not overlap due to low effluent flows. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: Lake Michigan is 303(d) listed as impaired for PCBs.

**Effluent Information**

- Flow rate(s):  
 Maximum annual average = 0.02 MGD (Million Gallons per Day)  
 This is the estimated maximum intake flow rate the facility anticipates during the decommissioning process. Most of the time, the effluent flow will consist of stormwater and groundwater and will be less than this. Since 2019, the actual average of effluent flow was reported as 0.00076 MGD.
- Hardness = 419 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of data 07/13/2016 – 08/03/2016 from the previous permit reissuance application.
- Water source: Rainwater, groundwater, and high purity deionized water from local utility.
- Additives: DC-13 and hydrogen peroxide are used to clean and remove radioactive material. Sodium hydroxide and sulfuric acid may be used intermittently for pH control. These additives will be used in the segmentation water of the reactor.

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- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation. This data is from the previous permit application and from 2019 which is assumed to have greater concentrations of toxics than the future discharge which will be using DI water.

**Mercury Effluent Data**

Sample Date	Mercury ng/L	Sample Date	Mercury ng/L	Sample Date	Mercury ng/L
01/24/2019	0.70	05/01/2019	1.89	09/03/2019	1.37
02/07/2019	0.95	06/03/2019	2.62	10/01/2019	1.71
03/01/2019	0.82	07/01/2019	1.51	11/01/2019	0.87
04/01/2019	0.91	08/01/2019	2.13	12/02/2019	1.11
1-day P <sub>99</sub> = 3.3 ng/L					
4-day P <sub>99</sub> = 2.2 ng/L					

**Arsenic Effluent Data**

Sample Date	Arsenic µg/L	Sample Date	Arsenic µg/L	Sample Date	Arsenic µg/L
01/24/2019	<8.30	05/01/2019	0.47	09/03/2019	0.49
02/07/2019	<8.30	06/03/2019	0.61	10/01/2019	0.70
03/01/2019	<8.30	07/01/2019	0.60	11/01/2019	0.84
04/01/2019	0.47	08/01/2019	0.61	12/02/2019	0.98
Average = 0.48 µg/L					

“<” means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected results.

The following table presents the average concentrations and loadings at Outfall 001 from 01/01/2018 – 10/31/2023 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

**Parameter Averages with Limits**

	Average Measurement
pH field	7.7 s.u.
Phosphorus	0.03 mg/L*

\*Results below the level of detection (LOD) were included as zeroes in calculation of average.

**PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN**

**Acute Limits based on 1-Q<sub>10</sub>**

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q<sub>10</sub> receiving water low flow to determine if more restrictive effluent

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limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(\text{WQC}) (Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)}{Q_e}$$

Where:

WQC = Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Q<sub>s</sub> = average minimum 1-day flow which occurs once in 10 years (1-day Q<sub>10</sub>)  
 if the 1-day Q<sub>10</sub> flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q<sub>10</sub>).

Q<sub>e</sub> = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

C<sub>s</sub> = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q<sub>10</sub> method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Kewaunee Solutions and the limits are set based on two times the acute toxicity criteria.

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**

10:1 dilution

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P <sub>99</sub>	1-day MAX. CONC.
Arsenic		340	1.8	680	136	0.48		
Cadmium	419	22.5		45.1	9.01	<1		
Chromium	301	4446		8892	1778	<1.5		
Copper	419	60.0		120	24.0	2.18		
Lead	356	365		729	145.9	<1.6		
Mercury (ng/L)		830	0.79	1660			3.3	2.62
Nickel	268	1080		2161	432	<1.3		
Zinc	333	345		689	138	<5.8		
Chloride (mg/L)		757		1514	303	12.5		
Boron***		18		18				

\* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

\*\* The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q<sub>10</sub> flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

\*\*\* The limit for this substance is based on a secondary value. Acute limits are set equal to the secondary value rather than two times or using the 1-Q<sub>10</sub> s. NR 106.06(3)(b)2 and s. NR 105.05(2)(f)6, Wis. Adm Code.

**Weekly Average Limits based on Chronic Toxicity Criteria (CTC)**

10:1 dilution

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P <sub>99</sub>
Arsenic		148	1.8	1610	322	0.48	
Cadmium	138	3.17		34.9	6.97	<1	
Chromium	138	112		1235	247	<1.5	
Copper	138	13.6		150	30.0	2.18	
Lead	138	38.2		421	84.1	<1.6	
Mercury (ng/L)		440	0.79	440			2.2
Nickel	138	68.5		754	151	<1.3	
Zinc	138	159.5		1755	351	<5.8	
Chloride (mg/L)		395		4345	869	12.5	
Boron**		1.0		11			

\* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

\*\* The limit for this substance is based on a secondary value.

**Monthly Average Limits based on Wildlife Criteria (WC)**

10:1 dilution

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P <sub>99</sub>
Mercury (ng/L)	1.3	0.79	1.3			<b>1.66</b>

**Monthly Average Limits based on Human Threshold Criteria (HTC)**

10:1 dilution

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P <sub>99</sub>
Cadmium	4.4		48.4	9.68	<1	
Chromium (+3)	100		1100	220	<1.5	
Lead	10		110	22.0	<1.6	
Mercury (ng/L)	1.5	0.79	1.5			<b>1.66</b>
Nickel	100		1100	220	<1.3	
Boron*	2.5		28			

\* The limit for this substance is based on a secondary value.

**Monthly Average Limits based on Human Cancer Criteria (HCC)**

10:1 dilution

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P <sub>99</sub>
Arsenic	0.2	1.8	0.2	0.04	<b>0.48</b>	

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In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

**Conclusions and Recommendations**

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are considered for mercury and arsenic.

Mercury – The previous permits required city water intake monitoring of mercury. Below is the table to summarize the previous city water intake data and effluent data from the current permit for comparison.

**Mercury Data**

	Raw Water Intake ng/L	Effluent Mercury ng/L
1-day P <sub>99</sub>	4.02	3.34
4-day P <sub>99</sub>	2.29	2.23
30-day P <sub>99</sub>	1.35	1.66
Mean	0.95	1.38
Std	0.82	0.60
Sample size	16	12
Range	<0.54 - 3.07	0.704 - 2.62
Dates	07/14/2008 – 04/01/2012	01/24/2019 – 12/02/2019

Section NR 106.06(6), Wis. Adm. Code, allows a facility to demonstrate that a pollutant present in intake water, which is passed through the facility and discharged does not cause, have the reasonable potential to cause, or contribute to the excursion of water quality criteria in the receiving water. The demonstration has five conditions, all of which must be met:

1. The permittee withdraws 100 percent of its intake water containing the substance from the same body of water into which the discharge is made;
2. The permittee does not contribute any additional mass of the substance to the wastewater;
3. The permittee does not alter the substance chemically or physically in a manner that would cause adverse water quality impacts to occur that would not occur if the pollutants were left in-stream;
4. The permittee does not increase the concentration at the edge of the mixing zone, or at the point of discharge if a mixing zone is not allowed, as compared to the concentration in the intake water, unless the increased concentration does not cause or contribute to an excursion above an applicable water quality standard; and
5. The timing and location of the discharge would not cause adverse water quality impacts to occur that would not occur if the identified intake pollutant were left instream.

All conditions are demonstrated for Kewaunee Solutions, so mercury limits are not recommended in the reissued permit.

This discharge currently includes majority groundwater and rainwater. The addition of DI water during the reissued permit term is not anticipated to contain levels of mercury above the calculated limits.

**Therefore, no limits are recommended but monitoring is recommended to be continued in the reissued permit.**

Arsenic – The current permit requires city water intake monitoring of arsenic. Below is the table to summarize the city water intake and effluent data from the current permit for comparison.

**Arsenic Data**

	Raw Water Intake µg/L	Effluent Arsenic µg/L
Mean	3.15	0.48
Std	4.11	0.17
Sample size	4	12
Range	0.7 – 9.3	<8.3 – 0.98
Dates	01/24/2019 – 10/01/2019	04/01/2019 – 12/02/2019

Section NR 106.06(6), Wis. Adm. Code, allows a facility to demonstrate that a pollutant present in intake water, which is passed through the facility and discharged does not cause, have the reasonable potential to cause, or contribute to the excursion of water quality criteria in the receiving water. The demonstration has five conditions, all of which must be met:

1. The permittee withdraws 100 percent of its intake water containing the substance from the same body of water into which the discharge is made;
2. The permittee does not contribute any additional mass of the substance to the wastewater;
3. The permittee does not alter the substance chemically or physically in a manner that would cause adverse water quality impacts to occur that would not occur if the pollutants were left in-stream;
4. The permittee does not increase the concentration at the edge of the mixing zone, or at the point of discharge if a mixing zone is not allowed, as compared to the concentration in the intake water, unless the increased concentration does not cause or contribute to an excursion above an applicable water quality standard; and
5. The timing and location of the discharge would not cause adverse water quality impacts to occur that would not occur if the identified intake pollutant were left instream.

All conditions are demonstrated for Kewaunee Solutions, so arsenic limits are not recommended in the reissued permit.

This discharge currently includes majority groundwater and rainwater. The addition of DI water during the reissued permit term is not anticipated to contain levels of arsenic above the calculated limits.

**Therefore, no limits are recommended but monitoring is recommended to be continued in the reissued permit.**

Boron – The discharge will contain an unknown concentration of boric acid from the component cooling water (CCW) heat exchanger which will be diluted with the reactor segmentation water before being



discharged through Outfall 001. Because Kewaunee Solutions will contain pH limits, the boric acid may be regulated through secondary boron limits.

There are calculated secondary limits for daily maximum based on ATC, weekly average based on CTC, and monthly average based on HTC. Because there is an unknown concentration of boron that will be in the effluent, reasonable potential cannot be determined. **Therefore, the daily maximum, weekly average, and monthly average limits are recommended in the reissued permit.**

Because the monthly average limit based on HTC is less stringent than the weekly average limit based on CTC, **the monthly average limit is recommended to be equal to the weekly average limit of 11 µg/L for expression of limits requirements** per s. NR 106.07(4)(e)2., Wis. Adm. Code.

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of discharge, PFOS and PFOA monitoring is not recommended. The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

### PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. Given the fact that Kewaunee Solutions does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

**Ammonia Nitrogen Effluent Data**

Sample Date	Ammonia Nitrogen mg/L
07/13/2016	<0.25
07/20/2016	0.49
07/27/2016	<0.25
08/03/2016	<0.25
Average*	0.12

\*Values lower than the level of detection were substituted with a zero

These concentrations are low, and well below any of the calculated QBELs based on the applicable acute and chronic ammonia criteria for the receiving water. Therefore, **no ammonia QBELs are necessary. No ammonia limits or monitoring are recommended in the reissued permit.**

### PART 4 – PHOSPHORUS

**Technology-Based Effluent Limit**

Subchapter II of Chapter NR 217, Wis. Adm. Code, requires industrial facilities that discharge greater than 60 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Kewaunee Solutions currently has a limit of 0.6 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent QBEL is given.

**Water Quality-Based Effluent Limits (WQBEL)**

Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to s. NR 102.06, Wis. Adm. Code, which establish phosphorus standards for surface waters. Subchapter III of NR 217, Wis. Adm. Code, establishes procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

Section NR 102.06(5)(b) specifies that a total phosphorus criterion of 7 µg/L (0.007 mg/L) applies for the open and nearshore water of Lake Michigan. For direct discharges to Lake Michigan such as Kewaunee Solutions, s. NR 217.13(4), Wis. Adm. Code, states that the Department shall set effluent limits consistent with nearshore or whole lake models approved by the Department. In the absence of an approved model, **a WQBEL of 0.6 mg/L as a six-month average is recommended. This limit is already effective in the current permit so is recommended to continue.**

**Effluent Data**

The following table summarizes effluent total phosphorus monitoring data from 11/05/2018 – 10/05/2023, for informational purposes.

**Total Phosphorus Effluent Data**

	<b>Phosphorus mg/L</b>
1-day P <sub>99</sub>	0.18
4-day P <sub>99</sub>	0.10
30-day P <sub>99</sub>	0.05
Mean*	0.03
Std	0.04
Sample size	70
Range	<0.052 – 0.28

\*Values lower than the level of detection were substituted with a zero

**PART 5 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL**

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

Due to the amount of upstream flow available for dilution in the limit calculation (Q<sub>s</sub>:Q<sub>e</sub> >20:1), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code). The table below summarizes the maximum temperatures reported during monitoring from 01/03/2022 – 12/01/2022.

**Monthly Temperature Effluent Data & Limits**

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	53	53	NA	120
FEB	51	51	NA	120
MAR	49	49	NA	120
APR	45	45	NA	120
MAY	46	46	NA	120
JUN	49	49	NA	120
JUL	52	52	NA	120
AUG	53	53	NA	120
SEP	57	57	NA	120
OCT	57	57	NA	120
NOV	56	56	NA	120
DEC	55	55	NA	120

**Reasonable Potential**

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
  - (a) The highest recorded representative daily maximum effluent temperature
  - (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub-lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  - (a) The highest weekly average effluent temperature for the month.
  - (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Based on the available effluent data, **no effluent limits or monitoring are recommended for temperature.** The complete thermal table used for the limit calculation is attached.

**PART 6 – WHOLE EFFLUENT TOXICITY (WET)**

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency

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and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (2022)*.

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC<sub>50</sub> (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC<sub>25</sub> (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 9% shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

The IWC is 9% based on dilution of 10 parts lake water to 1-part effluent, as specified in s. NR 106.06(4)(b)2, Wis. Adm. Code, or a factor of 1 in 11 to calculate the IWC.

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations. WET data prior to 2014 was not included in this evaluation because it is not representative of current conditions since the plant was decommissioned.

**WET Data History**

Date Test Initiated	Acute Results LC <sub>50</sub> %				Chronic Results IC <sub>25</sub> %			
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Pass or Fail?	Use in RP?
04/29/2014	>100	>100	Pass	Yes	>100	>100	Pass	Yes
01/20/2015					>100	>100	Pass	Yes
09/13/2016	>100	>100	Pass	Yes	>100	>100	Pass	Yes
01/14/2020	>100	>100	Pass	Yes	>100			

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- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

$$\text{Acute Reasonable Potential} = [(TUa \text{ effluent}) (B)(AMZ)]$$

$$\text{Chronic Reasonable Potential} = [(TUc \text{ effluent}) (B)(IWC)]$$

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC<sub>50</sub>, IC<sub>25</sub> or IC<sub>50</sub> ≥ 100%).

Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

Chronic Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: <https://dnr.wisconsin.gov/topic/Wastewater/WET.html>.

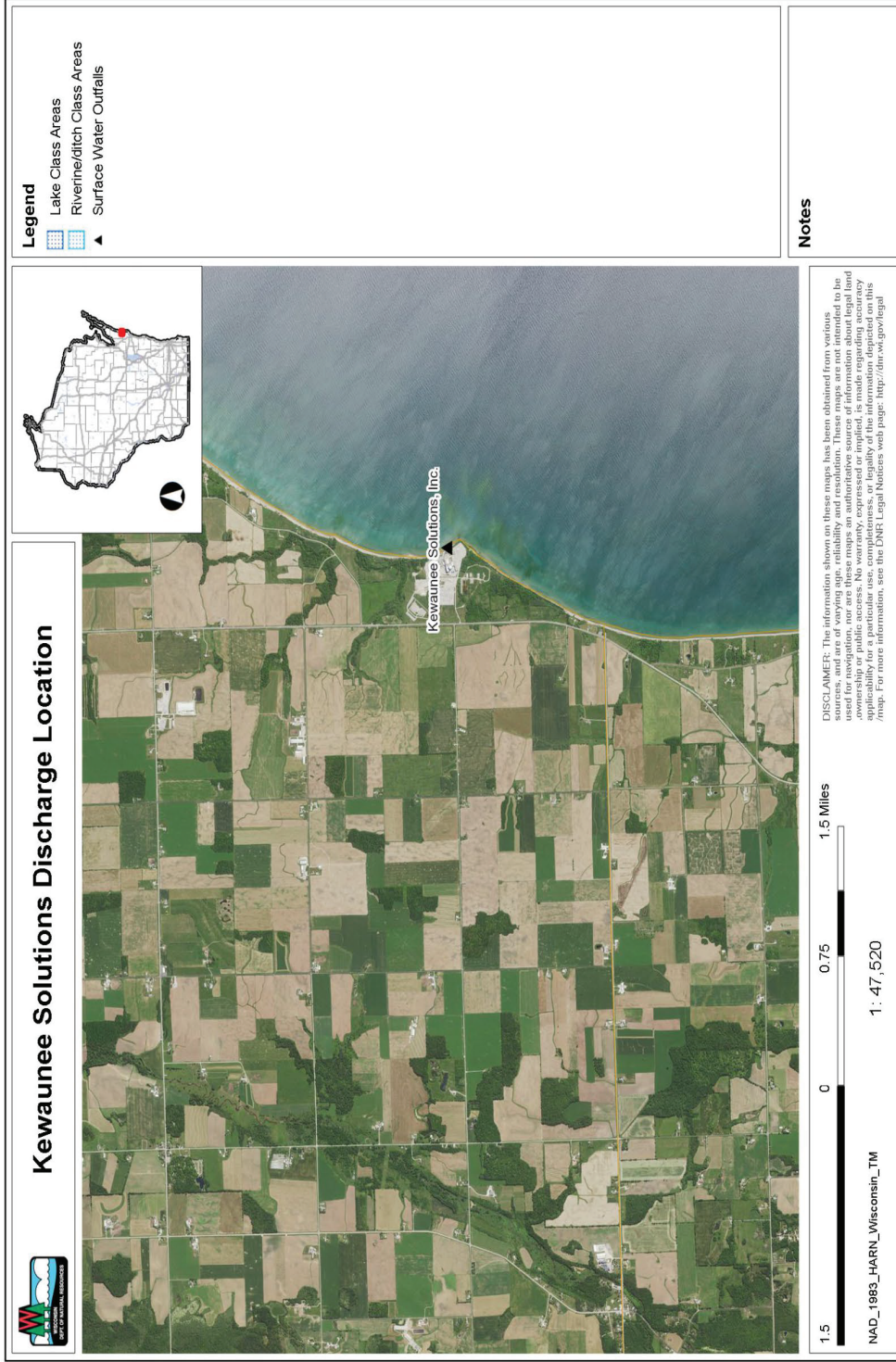
**WET Checklist Summary**

	<b>Acute</b>	<b>Chronic</b>
<b>AMZ/IWC</b>	Not Applicable. <b>0 Points</b>	IWC = 9%. <b>0 Points</b>
<b>Historical Data</b>	4 tests used to calculate RP. No tests failed. <b>0 Points</b>	4 tests used to calculate RP. No tests failed. <b>0 Points</b>
<b>Effluent Variability</b>	Little variability, no violations or upsets, consistent WWTF operations are expected. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Receiving Water Classification</b>	Coldwater classification. <b>5 Points</b>	Same as Acute. <b>5 Points</b>
<b>Chemical-Specific Data</b>	Reasonable potential for limits for no substances based on ATC; Arsenic, ammonia, mercury, and chloride detected. Additional Compounds of Concern: None.	Reasonable potential for limits for no substances based on CTC; Arsenic, ammonia, mercury, and chloride detected. Additional Compounds of Concern: None.

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	Acute	Chronic
	<b>3 Points</b>	<b>3 Points</b>
<b>Additives</b>	0 Biocides and 4 Water Quality Conditioners added. <b>4 Points</b>	All additives not used more than once per 4 days. <b>0 Points</b>
<b>Discharge Category</b>	Deionized water and stormwater. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Wastewater Treatment</b>	No treatment necessary. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Downstream Impacts</b>	No impacts known. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Total Checklist Points:</b>	<b>12 Points</b>	<b>8 Points</b>
<b>Recommended Monitoring Frequency (from Checklist):</b>	No tests recommended	No tests recommended
<b>Limit Required?</b>	No	No
<b>TRE Recommended? (from Checklist)</b>	No	No

- No WET testing is required because information related to the discharge indicates the potential for effluent toxicity is believed to be low.



### Temperature limits for receiving waters without unidirectional flow (calculation using default ambient temperature data)

**Facility:** Kewaunee Solutions  
**Outfall(s):** 001  
**Date Prepared:** 12/18/2023  
**Design Flow (Qe):** 5.11 MGD

**Lake Type:** Lake Michigan waters - N.  
**Discharge Type:** Great Lakes off-shore discharge

**Start:** 01/03/22  
**End:** 12/01/22  
**Flow Dates:** 01/01/18  
**Temp Dates:** 10/28/23

**Maximum area of mixing zone allowed (coefficient "A"):** 3,141,593 ft<sup>2</sup>

Month	Water Quality Criteria		Representative Highest Effluent Flow Rate (Qe)		B (for SL- WQBEL)	e <sup>a</sup> (for A- WQBEL)	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit		
	Ta (default) (°F)	Sub-Lethal WQC (°F)	Acute WQC (°F)	7-day Rolling Average (Qesl) (MGD)			Daily Maximum Flow Rate (Qea) (MGD)	Weekly Average (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	34	43	69	0.00022	0.00022	0.405	0.000	53	53	NA	120
FEB	33	47	69	0.00018	0.00072	0.405	0.033	51	51	NA	120
MAR	35	52	69	0.00053	0.00102	0.405	0.048	49	49	NA	120
APR	39	58	70	0.00018	0.00127	0.405	0.047	45	45	NA	120
MAY	44	64	71	0.02175	0.02263	0.405	0.043	46	46	NA	120
JUN	48	69	72	0.00536	0.00536	0.405	0.041	49	49	NA	120
JUL	53	71	73	0.00227	0.00227	0.405	0.005	52	52	NA	120
AUG	56	69	73	0.00039	0.00039	0.405	0.000	53	53	NA	120
SEP	53	64	73	0.01392	0.01392	0.405	0.000	57	57	NA	120
OCT	48	55	72	0.00793	0.00793	0.405	0.000	57	57	NA	120
NOV	42	47	70	0.00006	0.00006	0.405	0.000	56	56	NA	120
DEC	36	44	69	0.00008	0.00008	0.405	0.000	55	55	NA	120