

Facility Specific Standard Variance Data Sheet

Directions: Please complete this form electronically. Record information in the space provided. Select checkboxes by double clicking on them. Do not delete or alter any fields. For citations, include page number and section if applicable. Please ensure that all data requested are included and as complete as possible. Attach additional sheets if needed.

Section I: General Information

A. Name of Permittee: Village of East Troy

B. Facility Name: East Troy Wastewater Treatment Facility

C. Submitted by: Wisconsin Department of Natural Resources

D. State: Wisconsin **Substance:** Chloride **Date completed:** March 31, 2016

E. Permit #: WI-0020397-09-0 **WQSTS #:** (EPA USE ONLY)

F. Duration of Variance **Start Date:** August 1, 2016 **End Date:** June 30, 2021

G. Date of Variance Application: January 7, 2016

H. Is this permit a: First time submittal for variance
 Renewal of a previous submittal for variance (Complete Section IX)

I. Description of proposed variance: The proposed variance is for chloride from the chronic water quality standard of 400 mg/L to an interim limit of 482 mg/L. The permit contains source reduction measures along with a target value of 430 mg/L.

J. List of all who assisted in the compilation of data for this form

Name	Email	Phone	Contribution
Laura Dietrich	Laura.Dietrich@wisconsin.gov	414-263-8651	EPA data sheet
Amy Garbe	Amy.Garbe@wisconsin.gov	262-574-2135	Parts II, IV, VIII, IX and X
Nick Lent	Nicholas.Lent@wisconsin.gov	414-263-8623	Parts II D-H and J
Jim Schmidt	Jamesw.schmidt@wisconsin.gov	608-267-7658	Environmental Analysis portions of datasheet

Section II: Criteria and Variance Information

A. Water Quality Standard from which variance is sought: Chloride

B. List other criteria likely to be affected by variance: No other variances were requested

C. Source of Substance: Primarily from winter road salt application and home water softeners

D. Ambient Substance Concentration: 0 mg/L Measured Estimated
 Default Unknown

If measured or estimated, what was the basis? Include Citation. The receiving water (Perennial Stream B) has a 7Q10 low flow = 0 cfs, so the ambient concentration does not affect limit calculation. For informational purposes, the ambient concentration of Honey Creek just upstream of Perennial Stream B is 24.5 mg/L, which is the geometric mean of data collected by the permittee in 2012.

E. Average effluent discharge rate: 0.81 MGD (annual average design) **Maximum effluent discharge rate:** 1.28 MGD (annual average design)

F. Effluent Substance Concentration: Peak Weekly = 563 mg/L Measured Estimated
Peak Daily = 614 mg/L Default Unknown

H. If measured or estimated, what was the basis? Include Citation. Based on evaluation of East Troy's effluent data reported on discharge monitoring reports from July 2008 through November 2015.

I. Level currently achievable (LCA): 487 mg/L

J. Variance Limit: 482 mg/L

K. What data were used to calculate the LCA, and how was the LCA derived? (Immediate compliance with LCA is required.)
The WQBEL memo dated January 26, 2016 calculated the 4-day P99 using effluent data reported from July 2008 through November 2015. The 4-day P99 was 487.6 mg/L.

L. Explain the basis used to determine the variance limit (which must be ≤ LCA). Include citation.

Chapter NR 106, Subchapter IV, Wis. Adm. Code, allows for a variance; the imposition of a less restrictive interim limit; a compliance schedule that stresses source reduction and public education; and allowance for a target value or limit to be a goal for reduction.

Typically, the 4-day P99 of effluent data is used as the variance interim limit. However, the calculated 4-day P99 is 487 mg/L, which is greater than the current variance limit of 482 mg/L. It is considered inappropriate to increase the current variance limit since this would be counterproductive to achieving the ultimate objective of meeting the WQBEL. Hence the current variance limit of 482 mg/L will remain as the variance limit in the proposed permit.

M. Select all factors applicable as the basis for the variance provided under 40 CFR 131.10(g). Summarize justification below: 1 2 3 4 5 6

The use of a reverse osmosis system was evaluated. The cost of the system was estimated to an average cost per household that would result in a MHI of 4.93%. Without a variance, meeting the water quality standard of 400 mg/L would result in substantial and widespread economic and social impacts.

Section III: Location Information

A. Counties in which water quality is potentially impacted: Walworth and Racine Counties

B. Receiving waterbody at discharge point: Perennial Stream B

C. Flows into which stream/river? Honey Creek and eventually the Fox (IL) River

How many miles downstream? Approx. ¼ mile to Honey Creek, approx. 12 miles to the Fox (IL) River

D. Coordinates of discharge point (UTM or Lat/Long): Lat: 42°46.99'N/Long: 88°23.82'

E. What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the chronic criterion of the substance for aquatic life protection?

Less than ¼ mile

F. Provide the equation used to calculate that distance (Include definitions of all variables, identify the values used for the clarification, and include citation):

Since Perennial Stream B has zero flow, there is no dilution available during dry-weather periods to reduce the instream concentration,. In Honey Creek, the 7Q10 is 6.5 cfs with an estimated ambient concentration of 50 mg/L (based on nearby streams). This water body provides more than enough dilution to reduce the chloride concentration below the 395 mg/L chloride criterion after mixing with East Troy's effluent.

G. What are the designated uses associated with the direct receiving waterbody, and the designated uses for any downstream waterbodies until the water quality standard is met?

Warmwater sport fish community (default), non-public water supply

H. Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody: None

I. Please attach a map, photographs, or a simple schematic showing the location of the discharge point as well as all variances for the substance currently draining to this waterbody on a separate sheet

J. Is the receiving waterbody on the CWA 303(d) list? If yes, please list the impairments below. Yes No Unknown

Perennial Stream B is not on the CWA 303(d) list. However, Honey Creek which is less than ¼ mile downstream from Perennial Stream B is on the 303(d) list for biological impairment from an unknown pollutant.

K. Please list any contributors to the POTW in the following categories:

Food processors (cheese, vegetables, meat, pickles, soy sauce, etc.)	Contract Comestibles – 2004 Beulah Ave, East Troy, WI 53120
Metal Plating/Metal Finishing	None
Car Washes	Marathon Food Mart – 2711 Main Street, East Troy, WI 53120

	BP Gas Station – 1880 Main Street, East Troy, WI 53120
Municipal Maintenance Sheds (salt storage, truck washing, etc.)	None (salt is stored at the County Facility)
Laundromats	East Troy Laundry – 3264 Main Street, East Troy, WI 53120
Other presumed commercial or industrial chloride contributors to the POTW	Sanitary District #2 and all East Troy public schools
Section IV: Pretreatment (complete this section only for POTWs with DNR-Approved Pretreatment Programs. See w:\Variances\Templates and Guidance\Pretreatment Programs.docx)	
A. Are there any industrial users contributing chloride to the POTW? If so, please list. N/A – No approved Pretreatment program	
B. Are all industrial users in compliance with local pretreatment limits for chloride? If not, please include a list of industrial users that are not complying with local limits and include any relevant correspondence between the POTW and the industry (NOVs, industrial SRM updates and timeframe, etc) N/A	
C. When were local pretreatment limits for chloride last calculated? N/A	
D. Please provide information on specific SRM activities that will be implemented during the permit term to reduce the industry’s discharge of the variance pollutant to the POTW N/A	
Section V: Public Notice	
A. Has a public notice been given for this proposed variance? <input type="checkbox"/> Yes <input type="checkbox"/> No	
B. If yes, was a public hearing held as well? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
C. What type of notice was given? <input checked="" type="checkbox"/> Notice of variance included in notice for permit <input type="checkbox"/> Separate notice of variance	
D. Date of public notice: <u>May 2016</u> Date of hearing: <u>June 27, 2016</u>	
E. Were comments received from the public in regards to this notice or hearing? (If yes, please attach on a separate sheet) <input type="checkbox"/> Yes <input type="checkbox"/> No	
Section VI: Human Health	
A. Is the receiving water designated as a Public Water Supply? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
B. Applicable criteria affected by variance: No human health criteria are available for chloride	
C. Identify any expected impacts that the variance may have upon human health, and include any citations: None	
Section VII: Aquatic Life and Environmental Impact	
A. Aquatic life use designation of receiving water: <u>Warmwater sport fish community</u>	
B. Applicable criteria affected by variance: Chronic toxicity criterion for chloride is 395 mg/L (rounded to 400 mg/L) from ch. NR 105, Wis. Adm. Code, applicable in all Wisconsin waters regardless of use designation	
C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations: The proposed interim limit of 482 mg/L results in an instream concentration of 482 mg/L after mixing since Perennial Stream B has zero background flow. This result exceeds only the genus mean chronic value for <u>Ceriodaphnia</u> (417 mg/L).	
D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations: None that would affect the water quality criterion, as the chronic toxicity criterion for chloride is more stringent than all genus mean chronic values for organisms with chloride toxicity data. As a result, no	

endangered species with data would need more protection than already provided by the existing criterion.

Citation: U.S. Fish & Wildlife Service – Environmental Conservation Online System (<http://www.fws.gov/endangered/>) and National Heritage Index (<http://dnr.wi.gov/topic/nhi/>)

Section VIII: Economic Impact and Feasibility

A. What modifications would be necessary to comply with the current limits? Include any citations.

Upgrades including reverse osmosis (RO) will be needed to comply with the WQBEL of 400 mg/L.

B. How long would it take to implement these changes?

The ultimate objective is that the permittee comply with the water quality based effluent limit, and allow reduction activities to extend through more than one permit term if needed.

C. Estimate the capital cost (Citation): \$1,032,750

D. Estimate additional O & M cost (Citation): \$335,070

E. Estimate the impact of treatment on the effluent substance concentration, and include any citations:

An interim limit of 482 mg/L with a target value of 430 mg/L, an 11% reduction in chloride discharged. To the final water quality effluent based limit of 400 mg/L, there would be a 17% reduction in chloride discharged.

F. Identify any expected environmental impacts that would result from further treatment, and include any citations:

There would be some impacts based on disposal of brine from RO. These include air pollution impacts from trucking brine and increased chloride impacts at the point where brine is discharged.

G. Is it technically and economically feasible for this permittee to modify the treatment process to reduce the level of the substance in the discharge? Yes No Unknown
(Provide the basis for this conclusion, including citations. If treatment is technically infeasible, provide an analysis of the factors that demonstrates technical infeasibility. If treatment is economically infeasible, provide an analysis of the economic cost to ratepayers that demonstrate economic infeasibility. Attach additional sheets if necessary.)

It is not economically feasible for this permittee to modify the treatment process because of the limited funds available to them. Instead, they plan to evaluate sewer use ordinances and add additional provisions in the ordinances in order to stimulate water softening initiatives in residences and industry. Installation of RO would result in a sewer rate of 4.93% of median household income.

H. If treatment is possible, is it possible to comply with the limits on the substance? Yes No Unknown

I. If yes, what prevents this from being done? Include any citations.

End of pipe Reverse Osmosis (RO) treatment could reduce effluent chloride concentrations to chronic toxicity criterion. However, attaining the applicable water quality standards specified in chs. NR 102 to 105, Wis. Adm. Code, may cause substantial and widespread adverse social and economic impacts in the community where the discharger is located.

J. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations:

Reverse Osmosis (RO) – not economically feasible

Section IX: Compliance with Water Quality Standards

A. Describe all activities that have been, and are being, conducted to reduce the discharge of the substance into the receiving stream. This may include existing treatments and controls, consumer education, promising centralized or remote treatment technologies, planned research, etc. Include any citations.

The Village of East Troy has put forth considerable effort to educate the community as well as the contributing sanitary district and industries. The Village has also implemented a water softener replacement program within the village and sanitary district. The WWTP no longer accepts hauled in septage waste and manholes are evaluated and tightened during street maintenance.

B. Describe all actions that the permit requires the permittee to complete during the variance period to ensure reasonable progress towards attainment of the water quality standard. Include any citations.

From East Troy's proposed permit:

2.2.1.7 Chloride Variance – Implement Source Reduction Measures

This permit contains a variance to the water quality-based effluent limit (WQBEL) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code. The target value for 2021 is 430 mg/L. As conditions of this

variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) implement the chloride source reduction measures specified below, (c) follow the approved Source Reduction Plan and (d) perform the actions listed in the compliance schedule. (See the Schedules of Compliance section of the permit). A five year compliance schedule was given in order to provide the permittee adequate time to complete the items outlined below.

- Continue to educate homeowners, commercial establishments, and installers by sending them a copy of the Chloride Reduction Letter that has been developed in the past. Update the letter as needed.
- Investigate streets and other areas that require high salt use in winter whereby salt is entering the collection system and conduct appropriate maintenance.
- Continue to inspect manholes during street maintenance activities. Upgrade manholes as needed.
- Test collection system by zones to identify reductions or sources of Chlorides based on original 2008 testing.
- Require Significant Commercial and Industrial Users contributors to evaluate their water treatment systems with regard to softened water requirements, with the result of that evaluation being the basis for potential restrictions to chloride inputs.
- Mandate a DIR and high salt efficiency standard for new residential softeners
- Request voluntary reductions in chloride from other industrial and commercial contributors and investigate chloride sources from car washes.
- Revise the agreement between the Village and dischargers outside the Village to include additional items to reduce chloride discharges.
- Investigate lab protocols for Chloride Analyses.
- Investigate the feasibility (technical and economic) of implementing lime softening as a means of achieving the WQBEL for chloride. The investigation may include an assessment of the existing infrastructure of the drinking water treatment plant, feasibility of installing a centralized lime softening system, applicability of lime softening and a cost analysis to determine expenses associated with centralized lime softening.
- Evaluate the elimination of discharge to “perennial stream B” by constructing force main from the current outfall locations to Honey Creek.

Submit annual chloride reduction progress reports (a total of four) indicating which chloride source reduction measures have been implemented and a calculated annual mass discharge of chloride. Also, submit a Final Chloride Report documenting the success in meeting the chloride target value of 430 mg/L.

Section X: Compliance with Previous Permit (Variance Reissuances Only)

A. Date of previous submittal: <u>2008</u>	Date of EPA Approval: <u>State Approved</u>
B. Previous Permit #: <u>WI-0020397-08-0</u>	Previous WQSTS #: _____ (EPA USE ONLY)
C. Effluent substance concentration: <u>516 mg/L (4-day P99)</u>	Variance Limit: <u>482 mg/L</u>
D. Target Value(s): <u>430 mg/L</u>	Achieved? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Partial

E. For renewals, list previous steps that were to be completed. Show whether these steps have been completed in compliance with the terms of the previous variance permit. Attach additional sheets if necessary.

Condition of Previous Variance	Compliance
Identify sources of chloride to the sewer system.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Educate homeowners on the impact of chloride from residential softeners, discuss options available for increasing softener salt efficiency, and request voluntary reductions.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Recommend residential softener tune-ups on a voluntary basis.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Request voluntary support from local water softening businesses in the efforts described above.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Educate licensed installers and self-installers of softeners on providing optional hard water for outside	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

faucets for residences.	
Request voluntary reductions in chloride input from industrial and commercial contributors.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No