EPA's Review of Wisconsin Department of Natural Resources
Request for Approval of a Variance from Chloride Water Quality Standards
Delafield Hartland Pollution Control Commission
WPDES WI-0032026-08
Under Section 303(c) of the Clean Water Act.
WQSTS # WI2014-611

Date:

I. Summary

A. Date received by EPA: December 4, 2014

B. Submittal History:

On December 3, 2014 the Wisconsin Department of Natural Resources (WDNR) submitted a request to EPA for approval of a variance from the water quality standard for chloride for a discharge from the Delafield Hartland Pollution Control Commission wastewater treatment facility, WPDES Permit Number WI-0032026-08, to the Bark River, a tributary to the Rock River, in Waukesha County, Wisconsin (Figure 1).

C. Documents included in the submittal:

- Delafield Hartland Pollution Control Commission Chloride Variance Application, dated September 4, 2014;
- Attachment to Variance Application for Municipal Facilities, dated September 14, 2012;
- Transmittal letter, Request for Approval of a Variance from Water Quality Standards for Chloride, from WDNR to EPA, dated November 26, 2014 and received on December 4 2014;
- Certification Statement for Approval of a Variance to Water Quality Standards, Delafield Hartland Pollution Control Commission, WPDES Permit No. WI-0032026-08, dated November 25, 2014 and received December 4, 2014;
- Facility Specific Standard Variance Data Sheet, undated;
- Trend Date for Chloride, mass and concentration for Delafield Hartland Pollution Control Commission;
- Delafield Hartland Map;
- Public Notice of Intent to Reissue, issued October 16, 2014;
- Notice of Final Determination to Reissue, undated;
- Substantial Compliance Determination, dated September 16, 2014;
- Delafield Hartland Chloride Source Reduction Measures List;
- Municipal Preliminary Screener Calculation for Use of RO in Wisconsin;
- Permit Fact Sheet, dated December 2, 2014;
- Proposed Permit, undated;
- Draft Permit, undated;
- Water Quality-Based Effluent Limitations for Delafield Hartland WWTP,

WPDES Permit No. WI–0032026-08, dated October 2, 2014;

- 2007 Annual Report;
- 2008 Annual Report;
- 2009 Annual Report; and
- 2010 Final Progress Report.

D. Other supporting documents:

- N/A

E. Description of Action:

WDNR is proposing a variance to the water quality standard for chloride for the Delafield Hartland Pollution Control Commission wastewater treatment facility which discharges into the Bark River in Waukesha County Wisconsin. The acute criterion for chloride in Wisconsin is 757 mg/L and the chronic criterion is 395 mg/L (weekly average) for all aquatic life use designations. The proposed variance limits are 615 mg/l as the interim limit and 490 mg/L as the target value at the end of the next permit term (12/31/2019).

F. Basis of Action:

NR 106.05(4) specifies that a limit for a toxicant applies if the 4-day 99th percentile (P99) is greater than the chronic toxicity criterion (CTC) based limit. The 4-day P-99 for Delafield Hartland is 614.92 mg/l. Since the 4-day P-99 is greater than the CTC-based effluent limit of 395 mg/L, WDNR determined that a water quality-based effluent limit (WQBEL) is needed for Delafield Hartland to protect aquatic life.

The Delafield Hartland wastewater treatment facility has an annual average design flow of 3.23 MGD. Delafield Hartland is seeking renewal of the variance, which previously had a limit of 640 mg/L and a target of 500 mg/L. This target value was not achieved. The previous variance was not submitted to EPA.

Trend data for chloride concentrations in the Delafield Hartland effluent for the period January 2010 through August 2014 generally indicate a slight increase in mass and concentration, however both measures fell slightly over the latter three years of this period (Figures 2-5). This decline is timed with the closure of Triad Industries in 2011, which was contributing wastewater with a chloride concentration of 625 mg/L prior to that time.

As indicated in Figures 2 and 4, Delafield Hartland remains unable to comply with the water quality-based effluent limit of 466 mg/L that is necessary to attain the 395 mg/L water quality standard for chloride. Accordingly, on November 26, 2014 Delafield Hartland submitted a variance request per NR 106.83(2)(b).

Section NR 106.82(9) defines a "Weekly average interim limitation" as follows:

> "(9) 'Weekly average interim limitation' means an effluent limitation calculated by the department which may be either:
> (a) The upper 99th percentile of the permittee's 4–day average of the representative data available to the department (4-day P99), or
> (b) A value no greater than 105% of the permittee's calculated highest weekly average of the representative effluent data."

The proposed *interim* limit for Delafield Hartland of 615 mg/l is equal to the 4-day P99. The proposed *target* limit of 490 mg/l represents the level to which Delafield Hartland estimates that it can achieve by the end of the five-year variance term given the source reduction measures (SRMs) that have been identified in its proposal.

Wisconsin statutes at s. 283.15 authorize WDNR to grant variances from water quality standards, if, among other things, it is demonstrated that, "The standard, as applied to the permittee, will cause substantial and widespread adverse social and economic impacts in the area where the permittee is located" (s. 283.15(4)(f)). Following EPA's draft interim economic guidance (EPA, 1995), WDNR evaluated information from Delafield Hartland's variance application, along with supplemental economic information, to determine whether the additional cost of providing wastewater treatment to remove chlorides from the effluent will result in substantial and widespread impacts on Delafield Hartland customers. The Municipal Preliminary Screener calculation for Delafield Hartland shows that the total annual pollution control cost per household for chloride removal would be $1,580, or 2 % of the median household income (MHI). Based on this analysis, WDNR has concluded that complying with the chloride criterion at the end of pipe would cause substantial and widespread adverse social and economic impacts and thus the granting of a variance for Delafield Hartland is consistent with Wisconsin's statutes at s. 283.15.

Subchapter VII of ch. NR 106 provides that a variance from water quality standards for chloride may be granted subject to the following conditions:

1) the permit shall include an "Interim" limitation intended to prevent an increase in the discharge of chlorides;
2) the permit shall include a "Target Limit" or "Target Value" to gauge the effectiveness of the SRMs, and progress toward the water quality-based effluent limitation; and
3) the permit shall specify SRMs to be implemented during the course of the permit term, with periodic progress reports.

Delafield Hartland has met these conditions, with an interim limit of 615 mg/l, a target limit of 490 mg/l.

Source Reduction Measures (SRMs)

Delafield Hartland indicates that most of its chloride is from water softeners. Road salt is a contributing source but is considered to be minor given that infiltration does not seem to be as significant as in other systems in the region. The following SRMs are being proposed:

1. Amend Delafield-Hartland's wastewater facility's sewer use ordinance to require high efficiency demand initiated regeneration (DIR) type softeners for both newly installed and replacement softeners for residences, commercial and industrial businesses.

2. Evaluate the imposition of installation restrictions so that outside hose bibs for gardening, etc. are on unsoftened water.

3. Investigate the possibility of brine leaching or being washed to the plant via run-off from the five municipalities' salt storage facilities and wash bays. Investigate also the structural conditions of all sewer manholes located close to these salt storage facilities.

4. Require the new industrial entity that will open up business in the building formerly occupied by Triad Industries to evaluate its process and operation with regard to chloride discharge. This evaluation should include softened water requirements and optimization of softener operation; chemicals used in its operation; and any other potential measures to reduce chloride discharge to the minimum possible - not to exceed 400 mg/L. Track chloride and flow as soon as production starts.

5. Evaluate chloride discharges from schools, hospitals, commercial institutions and other large water users, including laundromats and car washes. Require high chloride contributors to implement measures to ensure implementation of all feasible strategies to reduce chloride discharge.
The proposed permit also includes a requirement for annual progress reports during the permit term.

6. Identify areas in the collection system, including all contributing communities that may be experiencing high infiltration and inflow. Implement and/or require implementation of measures to address potential I/I problems.

7. Continue to educate the public about softener efficiency and chloride reductions.

II. Areas Affected and Environmental Impacts

A. Area Affected:

The area affected by this variance is the Bark River from the discharge to a distance roughly four miles downstream, which is the distance below which WDNR estimates the chronic chloride criterion of 395 mg/L will be met assuming that the concentration of chloride in the effluent is set equal to the limit of 615 mg/L (and also a design flow of 3.23 MGD and an ambient chloride concentration of 59 mg/L). Given that the effluent chloride concentration has not reached this level in several years, the area affected will be less than four miles downstream most of the time.

B. Environmental Impacts:

1. Aquatic Life

The chronic chloride criterion of 395 mg/L is much lower than the acute criterion and is the most difficult for a POTW in Wisconsin to meet, thus this is the most relevant benchmark for the

analysis of impacts to aquatic life. Following procedures in Section NR 105.06(5), Wis. Adm. Code, Wisconsin DNR evaluated the potential impact to aquatic organisms from the interim and target chloride limits (615 and 490 mg/l, respectively) by accessing available data on chronic chloride toxicity for thirteen freshwater aquatic genera found in the Great Lakes and Mississippi River basins.

The Bark River is designated as a Warmwater Sportfish Community. Under Wisconsin's procedures, criteria are set to protect 95% of all representative organisms. *Ceriodaphnia*, the most sensitive of the thirteen genera, experiences chronic toxicity at chloride concentrations greater than 417 mg/l. While the genus may be impacted under the interim limit of 615 mg/l, it is expected that any adverse impacts to *Ceriodaphnia* in these waters would occur only down to the point where adequate mixing occurs, four or fewer miles downstream. WDNR indicated that no other test organisms would experience chronic toxicity under the interim limit.

2. Human Health

Wisconsin has no water quality criterion for chloride related to human health. Aquatic and aquatic-dependent organisms would be much more sensitive to chloride toxicity than humans given their direct and constant exposure, thus the focus on source reduction and eventual attainment with the chronic chloride criterion of 395 mg/L, designed to be protective of aquatic life, will be protective of humans.

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

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

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

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

Section 101(a)(2) of the CWA specifies that designated uses "provide for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water." Section 303(c)(2) of the CWA requires that standards shall protect the public health and shall

take into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational, agricultural, industrial, and navigational purposes.

EPA is required to review and approve new and revised water quality standards submitted by States and Tribes. Possible EPA actions include:

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

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

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

WDNR issued a public notice for the proposed variance on October 16, 2014. Delafield Hartland questioned the dates for annual reporting on the chloride variance, which led Wisconsin WDNR to correct the date for the first annual report to December 31, 2014 from September 30, 2015. EPA asked WDNR two questions, one pertaining to the assumptions that went into the cost analysis of reverse osmosis (RO, which resulted in a 2% MHI cost burden on residents were RO to be installed to bring the plant into compliance), and one pertaining to the planned re-opening of the facility formerly home to Triad Industries, a major source of chloride loading to Delafield Hartland WWTP.

On the RO cost analysis, WDNR informed EPA that it typically uses a 10-mile brine hauling distance assumption. Given that the nearest facility that could accept brine from Delafield is Milwaukee, which is much further, the cost of RO as a percentage of MHI would actually be higher, were a more realistic travel distance included in calculating the cost of RO. Thus, the 10-mile assumption used by WDNR is actually conservative. EPA encourages WDNR to go with a more realistic brine hauling distance where the MHI percentage is near 2%.

Regarding the former Triad facility, WDNR explained that Medline will move in to the facility and will begin production in spring, 2015. Medline is expected to discharge 2,000-4,000 GPD to the Delafield Hartland plant as compared with 3,000-5,000 GPD for Triad. Also, Triad was allowed a chloride concentration of 600 mg/L in its effluent while Medline will be given 500 mg/L in its first year, and Delafield hopes to lower that to 400 mg/L eventually.

The issues raised by EPA have thus been resolved based on WDNR's information.

C. EPA's Review of Final Rules:

1. Review of Submittal for Completeness

Regulatory Requirement:	Wisconsin Variance Submittal for Delafield Hartland:
Use designations consistent with the provisions of section 101(a)(2) and 303(c)(2) of the Act (40 CFR 131.6(a))	The receiving water is designated as Warm Water Sport Fish. As such, the stream is designated for an aquatic life use that is consistent with the CWA 101(a)(2)/303(c)(2) level of protection. The stream is not classified as a public water supply. No change in use designations is being proposed.
Methods used and analyses conducted to support WQS revisions (40 CFR 131.6(b))	Documents submitted by WDNR in support of this variance include all items listed above under submittal history.
Water quality criteria sufficient to protect the designated uses of Wisconsin surface waters (40 CFR 131.6(c))	The acute chloride criterion is 757 mg/L and the chronic criterion is 395 mg/L. These criteria are not being changed by this action.
An antidegradation policy consistent with §131.12 (40 CFR 131.6(d))	Not applicable. This variance does not affect Wisconsin's existing antidegradation policy.
Certification by the State Attorney General or other appropriate legal authority within the State that the WQS were duly adopted pursuant to State law. (40 CFR 131.6(e))	WDNR's General Counsel certified the variance in a letter from Timothy A. Andryk to Tinka Hyde, dated November 25, 2014 and received December 4, 2014.
General information which will aid the Agency in determining the adequacy of the scientific basis of the standards which do not include uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to State standards which may affect their application and implementation. (40 CFR 131.6(f))	WDNR and Delafield Hartland submitted sufficient information to demonstrate that the likely harm to aquatic life from the chloride effluent will be limited spatially and temporally and will be reduced over time through the implementation of source reduction measures. Delafield will be required to submit annual progress reports documenting progress in meeting the target source reduction value. This information will then be available to inform future chloride attainment determinations and variance negotiations between WDNR and Delafield.

2. EPA action on the final variance submitted by Wisconsin

This variance application is based on substantial and widespread adverse social and economic impacts that would occur if the facility was required to comply with the applicable chloride water quality standard, as provided in S. NR 106.83(2)(a)(4) of Wisconsin's administrative rules. EPA reviewed the economic data provided by Delafield in the application for a variance from Wisconsin's water quality standards for chloride, and WDNR's analysis of the impacts of the costs of wastewater treatment to remove chloride from the effluent. Given a median household income for the community of $79,152, the total annualized cost per household of all pollution

control, expressed as a percentage of median household income, is 2 %. This percentage equals the percentage above which a "substantial economic impact" is considered to occur (U.S. EPA 1995). This economic impact may also be considered to be widespread given its applicability to all households served by Delafield Hartland.

Based on this review, EPA concludes that compelling this community to comply with the effluent limits necessary to attain water quality standards would result in substantial and widespread adverse social and economic impacts on the community. Therefore, the chronic chloride water quality standard is not attainable for the duration of the proposed variance and a variance from the water quality standard for chloride is consistent with the CWA and federal regulations. As conditions of the variance, WDNR and Delafield have agreed upon an interim limit of 615 mg/l as a weekly average limit, source reduction measures, and a target value of 490 mg/L. Based upon the foregoing considerations EPA approves the variance from Wisconsin's chloride water quality standard for Delafield Hartland.

While Delafield Hartland is rightfully concerned with the impact of water softening on chloride levels, EPA appreciates that Delafield Hartland is also concerned with salt storage facilities, and we encourage the community to be vigilant on reducing the impacts of road salt on area waterways, such as calibration of salt trucks and pre-wetting, although some local roads may be under the jurisdiction of the county or other road maintenance authorities.

IV. Endangered Species Act (ESA) Requirements

As required under section 7 of the ESA and federal regulations at 50 CFR Part 402, EPA is required to consult with the U.S. Fish and Wildlife Service (FWS) on any action taken by EPA that may affect federally-listed threatened or endangered species or their critical habitat. Actions are considered to have the potential to affect listed species if listed species are present in the action area. The action area for the Delafield Hartland chloride variance is from the Delafield Hartland treatment plant outfall then continuing downstream to where chloride concentrations are sufficiently diluted by mixing with river flow. WDNR estimates that the chloride concentration falls to the level of the chronic criterion of 395 mg/L in about four miles downstream of the Delafield Hartland wastewater treatment plant. Based on previous EPA work in Ohio, EPA has adopted a ten mile distance as a conservative distance for estimating the downstream end of the action area, although as indicated previously, chloride levels are unlikely to pose a problem beyond about four miles below the outfall.

EPA checked the USFWS-Midwest Region's Section 7 Consultation website (www.fws.gov/midwest/endangered/lists/pdf/WisconsinCtyListMatch2012.pdf) on December 11, 2014 and determined that the following species are listed for Waukesha County:

Eastern prairie fringed orchid, *Platanthera leucophaea*, threatened;
Northern long-eared bat, *Myotis septentrionalis* (proposed endangered); and
Poweshiek skipperling, *Oarisma poweshiek* (proposed endangered, proposed critical habitat).

According to FWS, the eastern prairie fringed orchid does not occur in proximity to the Delafield Hartland wastewater treatment facility (FWS pers. comm. December 1, 2014). FWS further confirmed that long-eared bat is a terrestrial species (FWS pers. comm. February 26, 2014). Additionally, the Delafield Hartland wastewater treatment facility is located in north-central Waukesha County, well north of the area designated as critical habitat for the Poweshiek skipperling in the southern Kettle Moraine Forest in southwest Waukesha County (FWS pers. comm. May 8, 2014). As the Bark River flows southwest from the Delafield Hartland plant it passes well to the north of the Poweshiek critical habitat. Thus, given that no listed or proposed listed species, or critical habitat, is located in the action area, there will be **no effect** on any federally-listed species or critical habitat, and consultation is not required.

V. Tribal Consultation Requirements

On May 4, 2011, EPA issued the "EPA Policy on Consultation and Coordination with Indian Tribes" to address Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments." The EPA Tribal Consultation Policy states that "EPA's policy is to consult on a government-to-government basis with federally recognized tribes when EPA actions and decisions may affect tribal interests." EPA reviewed the location of tribal lands in Waukesha County southward and concluded that no tribal lands were located within the project area (see Figure 1). Thus, consultation is not necessary as tribal interests are not affect by the proposed variance.

VI. Documents Considered by EPA

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

Tribal Consulation for Permit WI0032026

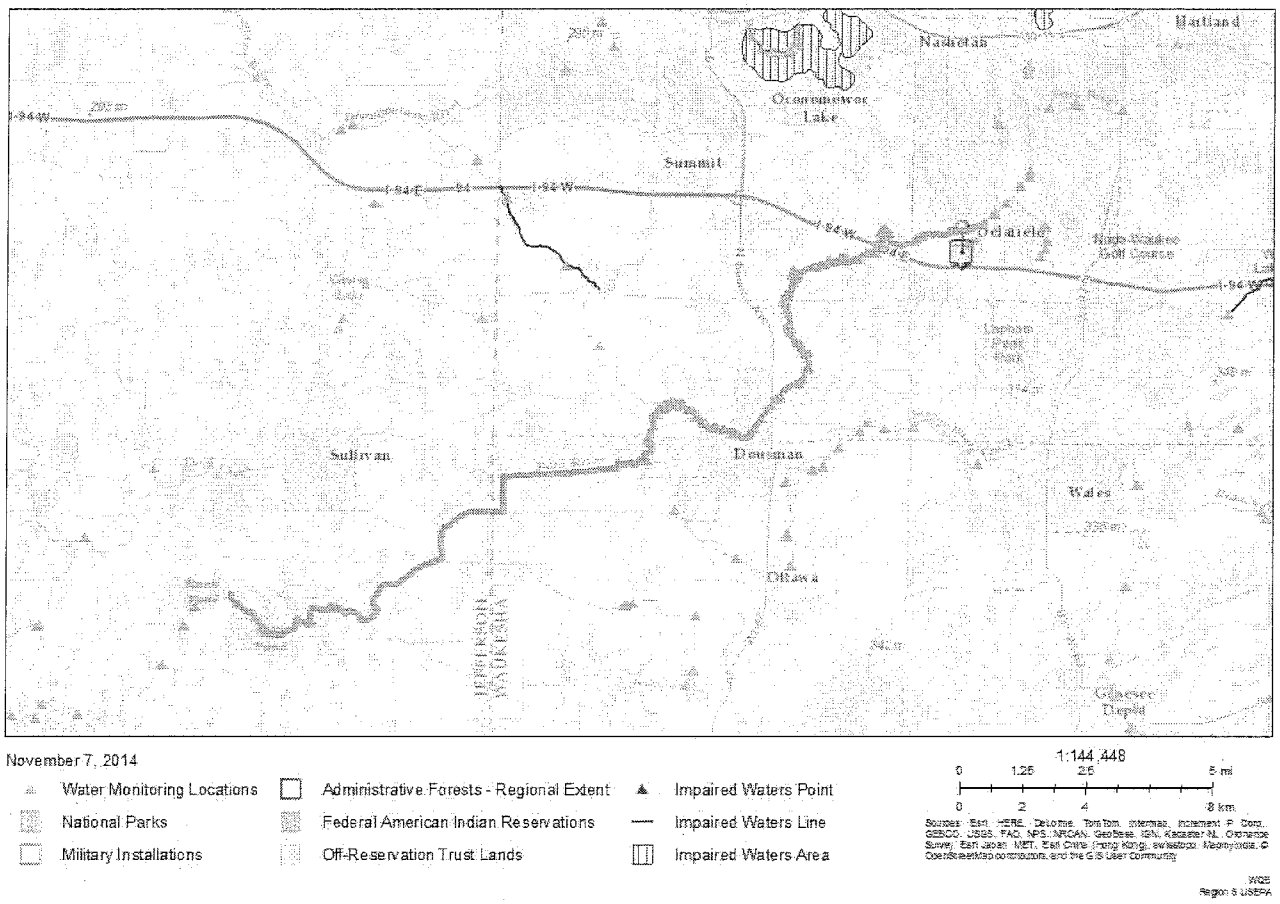

Figure 1. Map showing location of Delafield Hartland WWTP on the Bark River. Purple line shows bark River for a distance of 20 miles downstream from Delafield Hartland WWTP.

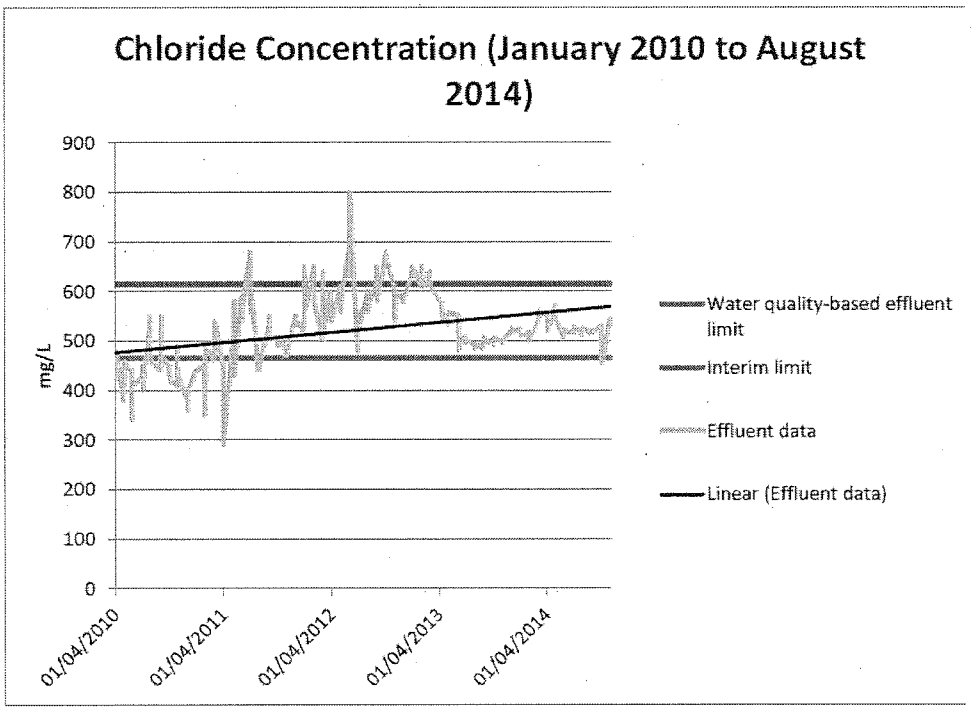

Figure 2. Chloride effluent concentration levels for Delafield Hartland from January 1, 2010 through August 31, 2014.

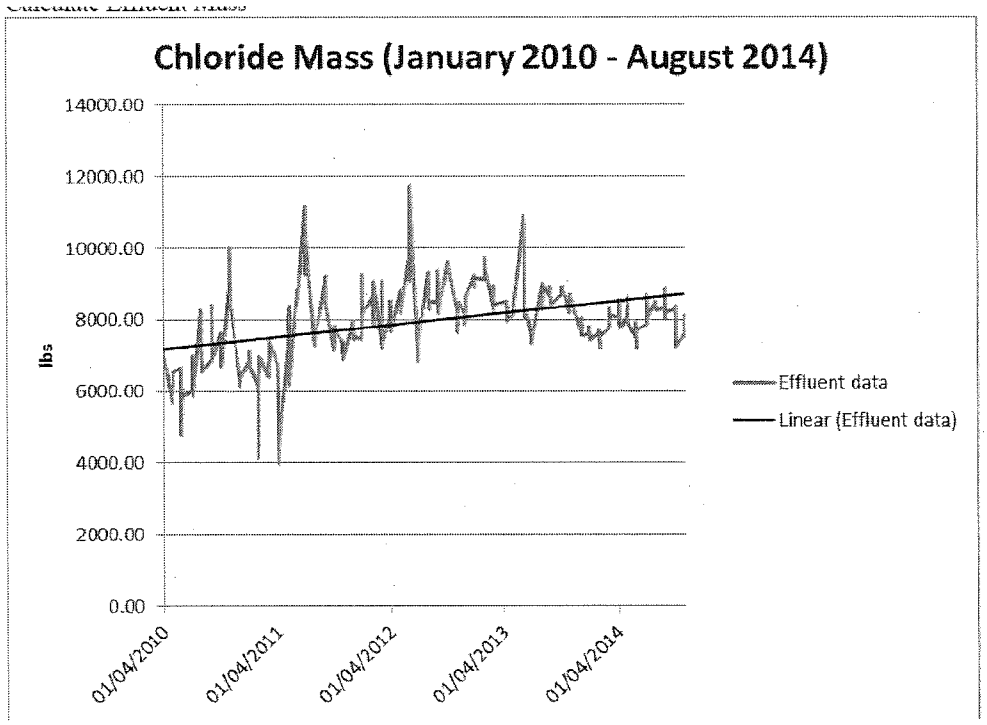

Figure 3. Chloride effluent mass levels for Delafield Hartland from January 1, 2010 through August 31, 2014.

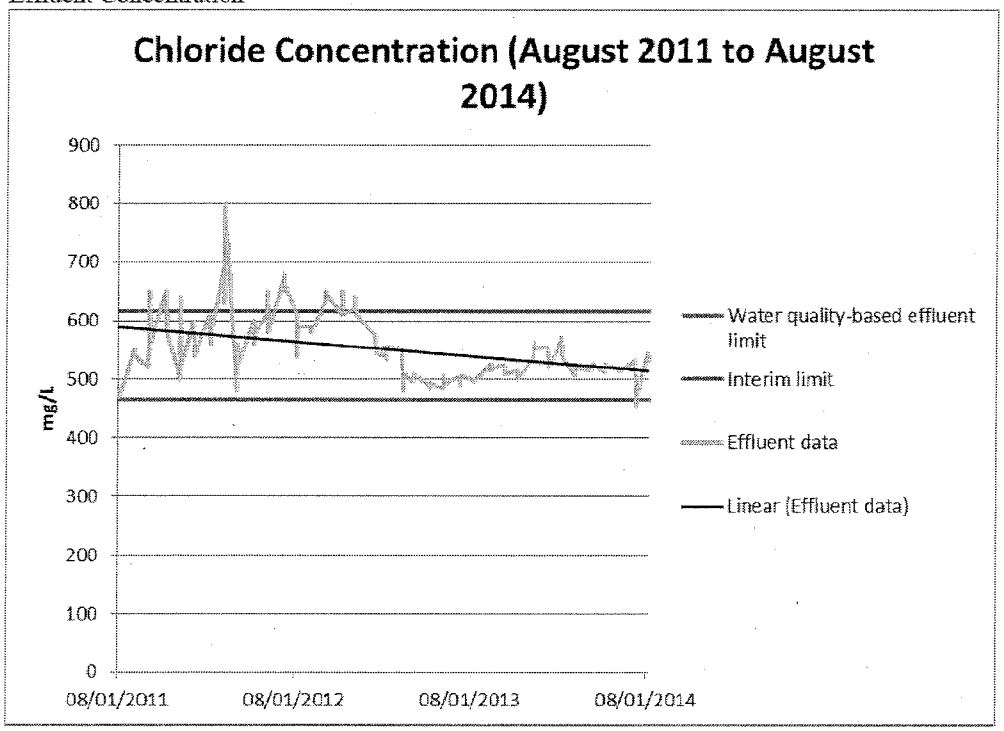

Figure 4. Chloride effluent concentration levels for Delafield Hartland from August 1, 2011 through August 31, 2014.

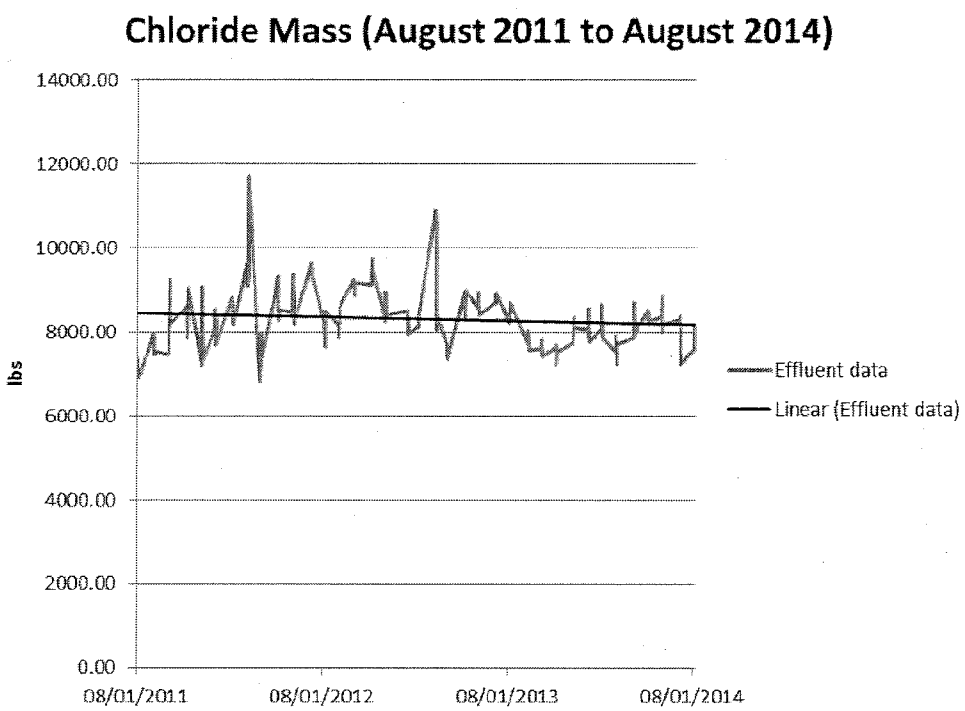

Figure 5. Chloride effluent mass levels for Delafield Hartland from August 1, 2011 through August 31, 2014.