

NPDES Permit No. NH0100960

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND REGION
ONE CONGRESS STREET
BOSTON, MASSACHUSETTS 02114-2023**

FACT SHEET

**DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES**

NPDES PERMIT NO.: NH0100960

NAME AND MAILING ADDRESS OF APPLICANT:

Winnepesaukee River Basin Program Wastewater Treatment Plant
P.O. Box 68
Franklin, New Hampshire 03235

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Winnepesaukee River Basin Program Wastewater Treatment Plant
528 River Street
Franklin, New Hampshire 03235

The Towns listed below are co-permittees for activities required in Part I.B. (Unauthorized Discharges), Part I.C. (Operation and Maintenance of the Sewer System) and Part I.D. (Alternate Power Source).

Town of Belmont
P.O. Box 310
Belmont, NH 03220

Town of Gilford
Public Works Department
55 Cherry Valley Road
Gilford, NH 03249

Town of Northfield
Northfield Sewer Commission
123 Park Street
Northfield, NH 03276

Bay District Sewer Commission
P.O. Box 1527
Center Harbor, NH 03226

City of Laconia
Public Works Department
27 Bisson Avenue
Laconia, NH 03246

Town of Sanbornton
P.O. Box 124
Sanbornton, NH 03269

City of Franklin
Department of Municipal Services
43 West Bow Street
Franklin, NH 03235

Town of Meredith
41 Main Street
Meredith, NH 03253

Town of Tilton
Tilton Sewer Commission
257 Main Street
Tilton, NH 03276

RECEIVING WATER: Merrimack (Hydrologic Unit Code: 01070002)

CLASSIFICATION: B

TABLE OF CONTENTS

I. Proposed Action, Type of Facility, and Discharge Location.....3

II. Description of Discharge.....3

III. Limitations and Conditions.....3

IV. Permit Basis and Explanation of Effluent Limitation Derivation.....3

 a. General Regulatory Background.....3

 b. Introduction.....5

 i. Reasonable Potential.....5

 ii. Anti-Backsliding.....5

 iii. State Certification.....6

 c. Flow.....6

 d. Conventional Pollutants.....7

 i. CBOD₅ and TSS.....7

 ii. pH.....7

 iii. Escherichia coli.....7

 e. Non-Conventional and Toxic Pollutants.....8

 i. 7Q10 Flow and Available Dilution.....8

 ii. Total Residual Chlorine.....8

 iii. Ammonia Nitrogen as N.....8

 iv. Phosphorus.....9

 f. Whole Effluent Toxicity.....11

 g. Pretreatment.....12

 h. Operation and Maintenance.....13

 i. Sludge.....13

 j. Essential Fish Habitat and Endangered Species.....14

 i. Essential Fish Habitat.....14

 ii. Endangered Species.....15

V. Antidegradation.....15

VI. State Certification Requirements.....15

VII. Comment Period, Hearing Requests, and Procedures for Final Decision.....16

Attachment A - Plant Location.....18

Attachment B - Summary of Effluent Characteristics at Outfall 001.....19

Attachment C - CBOD₅ and TSS Effluent Mass Limit Calculations.....20

Attachment D - Dilution Factor Calculation.....21

Attachment E - Ammonia Calculations.....22

I. Proposed Action, Type of Facility, and Discharge Location.

The above named applicant has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of its NPDES permit to discharge treated effluent into the designated receiving water. The facility is involved in the collection and treatment of municipal, commercial, and industrial wastewaters. Secondary treatment is provided using an activated sludge system and disinfection is provided by ultraviolet light. Backup disinfection is provided by chlorination. The facility has a design flow of 11.5 mgd and discharges the treated wastewater from Outfall 001 to the Merrimack River.

The municipalities listed on page 1 of this Fact Sheet own and operate portions of the collection system and have therefore been added as co-permittees for portions of the permit relating to unauthorized discharges, operation and maintenance of the sewer system, and alternate power sources.

The previous permit was issued on March 30, 1998 and expired on March 30, 2003. The expired permit (“existing permit”) has been administratively extended because the applicant filed a complete application for permit reissuance pursuant to 40 Code of Federal Regulations (C.F.R.) Section 122.6.

The location of the facility, Outfall 001, and receiving water are shown in Attachment A.

II. Description of Discharge.

A quantitative description of significant effluent parameters based on Discharge Monitoring Reports (DMRs) is shown in Attachment B. The data are from January 2004 through July 2007.

III. Limitations and Conditions.

Effluent limitations and monitoring requirements are found in PART I of the draft NPDES permit.

IV. Permit Basis and Explanation of Effluent Limitation Derivation.

a. General Regulatory Background

Congress enacted the Clean Water Act (CWA) “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into waters of the United States from any point source, except as authorized by specified permitting sections of the CWA, one of which is Section 402. See CWA §§ 301(a) and 402(a). Section 402 establishes one of the CWA’s principal permitting programs, the National Pollutant Discharge Elimination System (NPDES). Under this section of the CWA, EPA may “issue a permit for the discharge of any pollutant or combination of pollutants” in accordance with certain conditions. See CWA § 402(a). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. See CWA § 402(a)(1)-(2).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: “technology-based” limitations and “water quality-based” limitations. See CWA §§ 301, 303,

304(b); 40 C.F.R. Parts 122, 125, 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted. See CWA § 301(b). As a class, POTWs must meet performance based requirements dependent on available wastewater treatment technology. CWA § 301(b)(1)(B). The performance level for POTWs is referred to as “secondary treatment”. Secondary treatment is comprised of technology-based requirements expressed in terms of BOD₅, TSS, and pH. 40 C.F.R. Part 133.

Water quality-based effluent limits are designed to ensure that state water quality standards are met regardless of the decision made with respect to technology and economics in establishing technology-based limitations. In particular, Section 301(b)(1)(C) requires achievement of, “any more stringent limitation, including those necessary to meet water quality standards...established pursuant to any State law or regulation...” See 40 C.F.R. §§ 122.4(d), 122.44(d)(1) (providing that a permit must contain effluent limits as necessary to protect State water quality standards, “including State narrative criteria for water quality”) (emphasis added) and 122.45(d)(5) (providing in part that a permit incorporate any more stringent limits required by Section 301(b)(1)(C) of the CWA).

The CWA requires that States develop water quality standards for all water bodies within the State. CWA § 303. These standards have three parts: (1) one or more “designated uses” for each water body or water body segment in the state; (2) water quality “criteria” consisting of numerical concentration levels and/or narrative statements specifying the amounts of various pollutants that may be present in each water body without impairing the designated uses of that water body; and (3) an antidegradation provision, focused on protecting high quality waters and protecting and maintaining water quality necessary to protect existing uses. CWA § 303(c)(2)(a); 40 C.F.R. § 131.12. The limits and conditions of the permit reflect the goal of the CWA and EPA to achieve and then to maintain water quality standards.

The applicable New Hampshire water quality standards can be found in Surface Water Quality Regulations, Chapter Env-Wq 1700 et seq. See generally, Title 50, Water Management and Protection, Chapter 485A, Water Pollution and Waste Disposal Section 485-A. Hereinafter, New Hampshire’s Surface Water Quality Regulations are referred to as the NH standards.

Receiving stream requirements are established according to numerical and narrative standards adopted under state law for each stream classification. When using chemical-specific numeric criteria from a State’s water quality standards to develop permit limits, both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable in-stream pollutant concentrations. Acute aquatic life criteria are generally implemented through maximum daily limits and chronic aquatic life criteria are generally implemented through average monthly limits. When a State has not established a numeric water quality criterion for a specific pollutant that is present in the effluent in a concentration that causes or has a reasonable potential to cause a violation of narrative water quality standards, the permitting authority must establish effluent limits in one of three ways: based on a “calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use”; on a “case-by-case basis” using CWA § 304(a) recommended water quality criteria, supplemented as necessary by other

relevant information; or in certain circumstances, based on an “indicator parameter”. 40 C.F.R. § 122.44(d)(1)(vi)(A-C).

All statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired. When technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective. See 40 C.F.R. § 125.3(a)(1). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by an NPDES permit. The regulations governing EPA’s NPDES permit program are generally found in 40 C.F.R. Parts 122, 124, and 136.

b. Introduction

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that causes or has “reasonable potential” to cause or contribute to an excursion above any water quality standard, including narrative water quality criteria. See 40 C.F.R. 122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion.

i. Reasonable Potential

In determining reasonable potential, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from permit applications, monthly discharge monitoring reports, and State and Federal water quality reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in *Technical Support Document for Water Quality-based Toxics Controls*, March 1991, EPA/505/2-90-001 in Section 3; and where appropriate, (5) dilution of the effluent in the receiving water. In accordance with New Hampshire Standards (RSA 485-A:8VI, Env-Ws 1705.02), available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10) for aquatic life and human health criteria for non-carcinogens, or the long-term harmonic mean flow for human health (carcinogens only) in the receiving water at the point just upstream of the outfall. Furthermore, 10 percent of the receiving water’s assimilative capacity is held in reserve for future needs in accordance with New Hampshire’s Surface Water Quality Regulations Env-Ws 1705.01.

ii. Anti-backsliding

Section 402(o) of the CWA generally provides that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. Unless certain limited exceptions are met, “backsliding” from effluent limitations contained in previously issued permits is prohibited. EPA has also promulgated anti-backsliding regulations which are found at 40 C.F.R. § 122.44(l). Unless applicable anti-backsliding requirements are met, the limits and conditions in the reissued permit must be at least as stringent as those in the previous permit.

iii. State Certification

Section 401(a)(1) of the CWA requires all NPDES permit applicants to obtain a certification from the appropriate state agency stating that the permit will comply with all applicable federal effluent limitation and state water quality standards. See CWA § 401(a)(1). The regulatory provisions pertaining to state certification provide that EPA may not issue a permit until a certification is granted or waived by the state in which the discharge originates. 40 C.F.R. § 124.53(a). The regulations further provide that, “when certification is required...no final permit shall be issued...unless the final permit incorporated the requirements specified in the certification under § 124.53(e).” 40 C.F.R. § 124.55(a)(2). Section 124.53(e) in turn provides that the State certification shall include “any conditions more stringent than those in the draft permit which the State finds necessary” to assure compliance with, among other things, State water quality standards, see 40 C.F.R. 124.53(e)(2), and shall also include “[a] statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of State law, including water quality standards,” see 40 C.F.R. 124.53(e)(3).

However, when EPA reasonably believes that a State water quality standard requires a more stringent permit limitation than that reflected in a state certification, it has an independent duty under CWA §301(b)(1)(C) to include more stringent permit limitations. See 40 C.F.R. §§ 122.44(d)(1) and (5). It should be noted that under CWA § 401, EPA’s duty to defer to considerations of State law is intended to prevent EPA from relaxing any requirements, limitations, or conditions imposed by State law. Therefore, “[a] State may not condition or deny a certification on the grounds that State law allows a less stringent permit condition.” 40 C.F.R. § 124.55(c). In such an instance, the regulations provide that, “The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification.” Id. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 C.F.R. § 122.4(d) and 40 C.F.R. § 122.44(d).

c. Flow

The Winnepesaukee River Basin Program Wastewater Treatment Plant has a design flow of 11.5 mgd. This flow rate is used to calculate available dilution as discussed below. If the effluent flow rate exceeds 80 percent of the 11.5 mgd design flow (9.2 mgd) for a period of three (3) consecutive months then the permittee must notify EPA and the NHDES-WD and implement a program to maintain satisfactory treatment levels.

d. Conventional Pollutants

i. CBOD₅ and TSS

The average monthly and average weekly concentration-based limits for CBOD₅ and TSS are based on requirements under Section 301(b)(1)(B) of the CWA as defined for Secondary Treatment Standards in 40 CFR Section 133.102(a) and (b). The average monthly and average weekly mass-based limits for

CBOD₅ and TSS corresponding to the respective concentration-based limits in the draft permit are based on 40 CFR Section 122.45(f) which requires the Agency to apply these Secondary Treatment Standards (concentration-based) as mass-based limits. The monitoring frequency for both CBOD₅ and TSS is two (2) times per week.

Average monthly, average weekly and maximum daily allowable mass-based (load) limitations for BOD₅ and TSS shown in the draft permit are based on the POTW's daily design flow of 11.5 mgd and the appropriate constituent concentration for the respective time period being limited. See Attachment C for the equation used to calculate each of these mass-based limits

The percent removal limits for CBOD₅ and TSS are based on the requirements of 40 CFR Section 133.102 (a) (3) and (b)(3), respectively.

ii. pH

The pH limit range of 6.5 – 8.0 S.U. in the draft permit remains unchanged from the existing permit. Language under State Permit Conditions (PART I.H.5) allows for a change in the pH limit under certain conditions. A change would be considered if the applicant can demonstrate to the satisfaction of NHDES-WD that the pH standard of the receiving water will be protected when the discharge is outside the permitted range, then the applicant or NHDES-WD may request (in writing) that the permit limits be modified by EPA to incorporate the results of the demonstration. Anticipating the situation where NHDES-WD grants a formal approval changing the pH limit to outside 6.5 to 8.0 Standard Units (S.U.), EPA has added a provision to the draft permit (see SPECIAL CONDITIONS section). That provision will allow EPA to modify the pH limit using a certified letter approach. This change will be allowed only if it is demonstrated that the revised pH limit range does not alter the naturally occurring receiving water pH. However, the pH limit range cannot be less restrictive than 6.0 to 9.0 S.U. found in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 C.F.R. Part 133) for the facility.

iii. Escherichia coli

The average monthly and maximum daily limitations for Escherichia coli bacteria are based upon limitations in the existing permit in accordance with Class B water quality standards established by the State of New Hampshire in RSA 485-A:8.II and the anti-backsliding requirements mentioned above. The average monthly discharge of Escherichia coli is determined by calculating the geometric mean. The monitoring frequency of Escherichia coli bacteria is three (3) times per week.

e. Non-Conventional and Toxic Pollutants

Water quality based limits for specific toxic pollutants were determined from numeric chemical specific criteria derived from extensive scientific studies. The EPA has summarized and published specific toxic pollutants and their associated toxicity criteria in *Quality Criteria for Water*, 1986, EPA440/5-86-001 as amended, commonly known as the federal "Gold Book". Each pollutant generally includes an acute aquatic life criteria to protect against short term effects, such as death, and a

chronic aquatic life criteria to protect against long term effects, such as poor reproduction or impaired growth. New Hampshire adopted these “Gold Book” criteria, with certain exceptions, and included them as part of the State’s Surface Water Quality Regulations adopted on December 10, 1999. EPA uses these pollutant specific criteria along with available dilution in the receiving water to determine a pollutant specific draft permit limit.

i. 7Q10 Flow and Available Dilution

The available dilution of the receiving water is determined by using the facility’s design flow of 11.5 mgd and the annual 7-day mean low flow at the 10 year recurrence interval (7Q10) in the receiving water just above the treatment plant’s outfall. The available dilution is reduced by 10 percent to account for the State’s assimilative capacity reserve rule.

The existing permit used a dilution factor of 28.8. This is based upon the treatment plant design flow of 11.5 mgd and a 7Q10 at the Franklin Junction Gage of 550.6 cfs. Since issuance of the existing permit, the dilution factor has been reexamined and was decreased slightly to 24.2. This is based on a 7Q10 at the Franklin Junction Gage of 477.83 cfs plus 0.34 cfs from the intervening area between the gage and the treatment plant (total flow equaling 478.17 cfs). The revised dilution factor has been used to calculate water quality based limits for the current draft permit. The calculation of the dilution factor can be found in Attachment D.

ii. Total Chlorine Residual

The New Hampshire water quality standards specify the chronic and acute aquatic-life criterion for chlorine as 0.011 mg/l and 0.019 mg/l, respectively, for freshwater; and 0.0075 mg/l and 0.013 mg/l, respectively, for marine water. Based upon available dilution, applicable total residual chlorine limits would be a monthly average limit of 0.27 mg/l ($0.011 \text{ mg/l} * 24.2$) and a daily maximum limit of 0.46 mg/l ($0.019 \text{ mg/l} * 24.2$). These limits are the same as those found in the existing permit.

iii. Ammonia Nitrogen as N

The existing permit requires twice per week monitoring for ammonia nitrogen as N and reporting the monthly average and daily maximum values. This monitoring requirement was included in the existing permit for two reasons. First, because of nitrification in the facility’s treatment system the BOD₅ effluent limit was changed to a CBOD₅ limit pursuant to 40 C.F.R 133.102(a)(4). To document the extent of the ammonia discharged in the effluent that is part of the nitrogenous oxygen demand, monitoring was required. The second reason was due to concerns about ammonia toxicity in the effluent. During the development of the existing permit there was a concern that ammonia levels in the effluent were causing toxicity.

As shown in Attachment B the range of monthly averages for ammonia nitrogen as N is 12.3 to 30.9 mg/l with a maximum daily value of 43.4 mg/l. This is for the period January 2004 through July 2007. During this period the permittee has complied with the toxicity limits in the existing permit. Additionally, the ammonia levels in the effluent are below the acute and chronic thresholds (See

Attachment E) that would necessitate a permit limit. Therefore, the ammonia nitrogen as N monitoring requirement in the existing permit has been deleted from the draft permit.

iv. Phosphorus

Phosphorus and other nutrients (i.e. nitrogen) can promote the growth of nuisance algae and rooted aquatic plants. Typically, elevated levels of nutrients will cause excessive algal and/or plant growth resulting in reduced water clarity and poor aesthetic quality. Through respiration, and the decomposition of dead plant matter, excessive algae and plant growth can reduce in-stream dissolved oxygen concentrations to levels that could negatively impact aquatic life and/or produce strong unpleasant odors.

EPA has produced several guidance documents which contain recommended total phosphorus criteria for receiving waters. The 1986 Quality Criteria for Water (Gold Book) recommends in-stream phosphorus concentrations of 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharging directly to a lake or impoundment, and 0.025 mg/l within a lake or reservoir.

In December 2000, EPA released “Ecoregional Nutrient Criteria” (USEPA 2000), which was established as part of an effort to reduce problems associated with excess nutrients in water bodies located within specific areas of the country. The published criteria represent conditions in waters within each specific ecoregion which are minimally impacted by human activities, and thus are representative of waters without cultural eutrophication. The Winnepesaukee River Basin Program Wastewater Treatment Plant is within Ecoregion VIII, *Nutrient Poor, Largely Glaciated Upper Midwest and Northeast*. Recommended criteria for this ecoregion include a total phosphorus concentration of 10 ug/l (0.01 mg/l) and a chlorophyll *a* concentration of 0.63 ug/l (0.00063 mg/l). These recommended criteria are found in *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion VIII* (USEPA 2001).

More recently, Mitchell, Liebman, Ramseyer, and Card (in draft 2004), in conjunction with the New England States, developed potential nutrient criteria for rivers and streams in New England. Using several river examples representative of typical conditions in New England streams and rivers, they investigated several approaches for the development of river and stream nutrient criteria that would be dually protective of designated uses in both upstream and downstream impoundments. Based on this investigation an instream total phosphorus concentration of 0.020 – 0.022 mg/l was identified as protective of designated used for New England rivers and streams. The development of the New England-wide total phosphorus concentration was based on more recent data that the National Ecoregional nutrient criteria, and has been subject to quality assurance measures. Additionally, the development of the New England-wide concentration included reference conditions for waters presumed to be protective of designated uses.

The New Hampshire Surface Water Quality Regulations contain a narrative criterion which states that phosphorus contained in effluent shall not impair a water body’s designated use. Specifically, Env-Ws 1703.14(b) states that, “Class B waters shall contain no phosphorus or nitrogen in such concentrations

that would impair any existing or designated uses, unless naturally occurring.” Env-Ws 1703.14(c), further states that, “Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards.” Cultural eutrophication is defined in Env-Ws 1702.15 as, “... the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen.” Although numeric nutrient criteria have not yet been developed in New Hampshire, a total phosphorus concentration of 0.05 mg/l is considered by NHDES as a level of concern (NHVRAP).

Section 303(d) of the CWA requires States to identify those water bodies that are not expected to meet surface water quality standards after the implementation of technology-base controls and, as such, require the development of total maximum daily loads. The section of the Merrimack River to which the treatment plant discharges is identified by New Hampshire’s *Final List of Threatened or Impaired Water That Require a TMDL* (NHDES 2006) as assessment unit NHRIV700060101-14. At present, this stretch of the river is meeting the standards of its water quality classification. However, approximately 14.8 miles downstream assessment unit NHRIV700060302-24 of the Merrimack River located in Concord in not meeting water quality standards for aquatic life and fish. Parameters causing the impairments to aquatic life include aluminum, dissolved oxygen saturation, and pH. Fish impairments result from mercury concentrations. Because of these impairments a TMDL is scheduled for this section of the river however it is not expected until 2017.

Based upon information contained in the NPDES permit application for the Winnepesaukee River Basin Program Wastewater Treatment Plant the average daily discharge for total phosphorus from this facility is 1.78 mg/l. After applying the dilution factor of 24.2 an in-stream total phosphorus concentration of 0.074 mg/l is achieved (1.78 mg/l divided by 24.2). As discussed above, there are several recommended criteria for total phosphorus including the Gold Book (0.1 mg/l), the Ecoregional Criteria (0.01 mg/l), and the draft New England-wide criteria developed by Mitchell, Liebman, Ramseyer, and Card (0.020 – 0.022 mg/l). EPA has decided to determine the reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria using the Gold Book criteria of 0.1 mg/l for total phosphorus rather than the more stringent ecoregion and New England-wide criteria given that it was developed from an effects-based approach, versus the criteria that were developed on the basis of reference conditions. The effects-based approach is taken because it is often more directly associated with an impairment to a designated use (i.e. fishing, swimming). The effects based approach provides a threshold value above which adverse effects (i.e. water quality impairments) are likely to occur. It applies empirical observations of a causal variable (i.e. phosphorus) and a response variable (i.e. chlorophyll *a*) associated with designated use impairments. Reference-based values are statistically derived from a comparison within a population of rivers in the same ecoregion class. They are a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions.

Based upon available data the effluent causes in an instream total phosphorus concentration of 0.074 mg/l which is less than the Gold Book recommended criteria of 0.1 mg/l. Because the calculated concentration is less than the Gold Book recommended criteria and the river segment immediately downstream is not impaired because of nutrients, a total phosphorus limit is not proposed in the permit.

However, a total phosphorus monitoring requirement of once per month has been included in the permit to ensure that total phosphorus levels in the effluent remain at the present levels and to determine if total phosphorus effluent limitations will be needed in the future.

f. Whole Effluent Toxicity

EPA's Technical Support Document for Water Quality Based Toxics Control, EPA/505/2-90-001, March 1991, recommends using an "integrated strategy" containing both pollutant (chemical) specific approaches and whole effluent (biological) toxicity approaches to control toxic pollutants in effluent discharges from entering waters of the U.S.. EPA-New England adopted this "integrated strategy" on July 1, 1991, for use in permit development and issuance. These approaches are designed to protect aquatic life and human health. Pollutant specific approaches such as those in the Gold Book and State Regulations address individual chemicals, whereas whole effluent toxicity (WET) approaches evaluate interactions between pollutants thus rendering an "overall" or "aggregate" toxicity assessment of the effluent. Furthermore, WET measures the "additive" and/or "antagonistic" effects of individual chemical pollutants which pollutant specific approaches do not, thus the need for both approaches. In addition, the presence of an unknown toxic pollutant can be discovered and addressed through this process.

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts and New Hampshire law states that, "all waters shall be free from toxic substances or chemical constituents in concentrations or combinations that injure or are inimical to plants, animals, humans, or aquatic life;" (NH RSA 485-A:8, VI and the NH Code of Administrative Rules, PART Env-Ws 1703.21). The federal NPDES regulations at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when a discharge has a "reasonable potential" to cause or contribute to an excursion above the State's narrative criteria for toxicity. Inclusion of the whole effluent toxicity limit in the draft permit will demonstrate the compliance with narrative water quality criteria of "no toxics in toxics amounts" found in both the CWA and State of New Hampshire regulations.

The existing permit contains an LC50 limit of 100 percent. These permit limits have been carried forward in the draft permit. Toxicity test samples shall be collected and the tests completed each year during the quarters ending March 31st, June 30th, September 30th, and December 31st of each year. Toxicity test results shall be submitted by the 15th day of the month following the end of the quarter sampled.

Toxicity testing frequency may be reduced, to not less than once per year, after the completion of a minimum of the most recent four successive toxicity tests of effluent, all of which must be valid tests and demonstrate compliance with the permit limits for whole effluent toxicity. Any requests for toxicity testing frequency reduction must be made to EPA-New England in writing. If toxicity persists in the effluent, monitoring frequency and testing requirements may be increased. The permit may also be modified, or alternatively revoked and reissued, to incorporate additional toxicity testing requirements or chemical specific limits. These actions will occur if the Regional Administrator determines the NH standards are not adequately enforced and uses of the receiving water are not adequately protected during the remaining life of the permit. Results of these toxicity tests are

considered “new information not available at the permit development”, therefore, the permitting authority is allowed to use said information to modify an issued permit under authority in 40 C.F.R. §122.62(a)(2).

g. Pretreatment

The permittee is required to administer a pretreatment program based on authority granted under 40 C.F.R. Part 403 and Section 307 of the CWA. The permittee’s pretreatment program received EPA approval on July 1, 1984 and, as a result, appropriate pretreatment program requirements were incorporated into the existing permit which were consistent with the approval and federal pretreatment regulations in effect when the permit was issued.

Periodically, the Federal Pretreatment Regulations in 40 C.F.R. Part 403 are amended. Those amendments establish new requirements for implementation of the pretreatment program. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with the current Federal regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer use ordinance or regulation, as appropriate, to be consistent with Federal regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users. These requirements are necessary to ensure continued compliance with the NPDES permit.

On October 14, 2005 EPA published in the Federal Register final changes to the General Pretreatment Regulations. The final “Pretreatment Streamlining Rule” is designed to reduce the burden to industrial users and provide regulatory flexibility in technical and administrative requirements of industrial users and POTWs. Within 60 days of the effective date of this permit, the permittee must submit to EPA all required modifications of the Streamlining Rule in order to be consistent with the provisions of the newly promulgated Rule. To the extent that the POTW legal authority is not consistent with the required changes, they must be revised and submitted to EPA for review.

In addition to the requirements described above, the draft permit requires the permittee to submit to EPA in writing, within 180 days of the effective date of the permit, a description of proposed changes to the permittee’s pretreatment program deemed necessary to assure conformity with current federal pretreatment regulations. These requirements are included in the draft permit to ensure that the pretreatment program is consistent and up to date with all pretreatment requirements in effect. Lastly, the permittee must continue to submit, annually on May 1st a pretreatment report detailing the activities of the program for the twelve month period ending 60 days prior to the due date.

h. Operation and Maintenance

Regulations regarding proper operation and maintenance are found at 40 C.F.R. § 122.41(e). These regulations require, “that the permittee shall at all times operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to

achieve compliance with the conditions of the permit.” The treatment plant and the collection system are included in the definition “facilities and systems of treatment and control” and are therefore subject to proper operation and maintenance requirements.

Similarly, a permittee has a “duty to mitigate” pursuant to 40 C.F.R. § 122.41(d), which requires the permittee to “take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment.”

General requirements for proper operation and maintenance and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.B., I.C., and I.D. of the draft permit. These requirements include mapping of the wastewater collection system, reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to the extent necessary to prevent SSOs and I/I related effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary.

i. Sludge

Section 405(d) of the CWA requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations were signed on November 25, 1992, published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. Domestic sludge, which is land applied, disposed of in a surface disposal unit or fired in a sewage sludge incinerator, is subject to Part 503 technical standards. Part 503 regulations have a self implementing provision, however, in that the CWA requires implementation through permits. Domestic sludge, which is disposed of in a municipal solid waste landfill, is in compliance with Part 503 regulations, provided that the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 C.F.R. Part 258.

The draft permit requires that sewage sludge use and disposal practices meet Section 405(d) Technical Standards of the CWA. In addition, the EPA Region I – NPDES Permit Sludge Compliance Guidance document dated November 4, 1999 is included with the draft permit for use by the permittee in determining their appropriate sludge conditions for their chosen method of sludge disposal. The permittee is required to submit to EPA and to NHDES-WD annually, by February 19th, the various sludge reporting requirements as specified in the guidance document for the chosen method of sludge disposal.

The Winnepesaukee River Basin Program Wastewater Treatment Plant generates approximately 550 dry metric tons of sludge each year. The sludge from the facility is land applied.

j. Essential Fish Habitat and Endangered Species

i. Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable

Fisheries Act of 1996 (Public Law 104267), established a new requirement to describe and identify (designate) “essential fish habitat” (EFH) in each federal fishery management plan. Only species managed under a federal fishery management plan are covered. Fishery Management Councils determine which area will be designated as EFH. The Councils have prepared written descriptions and maps of EFH, and include them in fishery management plans or their amendments. EFH designations for New England were approved by the Secretary of Commerce on March 3, 1999.

The 1996 Sustainable Fisheries Act broadly defined EFH as “waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Waters include aquatic areas and their associated physical, chemical, and biological properties. Substrate includes sediment, hard bottom, and structures underlying the waters. Necessary means the habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers all habitat types utilized by a species throughout its life cycle. Adversely affect means any impact which reduces the quality and/or quantity of EFH. Adverse impacts may include direct (i.e. contamination, physical disruption), indirect (i.e. loss of prey), site specific or habitat wide impacts including individual, cumulative, or synergistic consequences of actions.

According to the National Marine Fisheries Service (NMFS), the Merrimack River is EFH for Atlantic salmon (*Salmo salar*). According to the New Hampshire Department of Fish and Game, Atlantic salmon are stocked further upstream in the Merrimack River watershed but not in this area. This stretch of the river is used primarily for downstream passage. Adult Atlantic salmon returning to the river from the ocean do not make it up this far because they are trapped at a dam in Lawrence, Massachusetts.

EPA has concluded that the limits and conditions contained in the draft permit minimize adverse effects to EFH for the following reasons:

- The permit prohibits the discharge to cause a violation of State water quality standards.
- The permit prohibits the discharge of pollutants or combinations of pollutants in toxic amounts.
- The permit requires toxicity testing four (4) times each year to ensure that the discharge does not present toxicity problems.
- The facility utilizes ultraviolet light disinfection for disinfection but also has water quality based limits for total residual chlorine when necessary.

EPA believes the draft permit adequately protects EFH and therefore additional mitigation is not warranted. NMFS will be notified and EFH consultation will be reinitiated if adverse impacts to EFH are detected as a result of this permit action or if new information becomes available that changes the basis for these conclusions.

ii. Endangered Species

The Endangered Species Act (16 U.S.C. 1451 et seq), Section 7, requires the EPA to ensure, in consultation with the U.S. Fish and Wildlife Service (USFWS) and/or NMFS, as appropriate, that any action authorized by EPA is not likely to jeopardize the continued existence of any endangered or threatened species, or adversely affect its critical habitat.

EPA believes that the authorized discharge from this facility is not likely to adversely affect the federally listed species or their habitats. EPA is informally consulting with USFWS to confirm this determination.

V. Antidegradation.

Except for ammonia, for which monitoring is no longer being required, the draft permit includes allowable wasteloads and parameter coverages at least as stringent as the existing permit. There is no anticipated new or increased activity pursuant to Env-Wq 1708.02(a). Since the State of New Hampshire has indicated that there will be no lowering of water quality and no loss of existing uses, no additional antidegradation review is needed.

VI. State Certification Requirements.

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violation NH standards or waives its right to certify as set forth in 40 C.F.R. §124.53.

Upon public noticing of the draft permit, EPA is formally requesting that the State's certifying authority make a written determination concerning certification. The State will be deemed to have waived its right to certify unless certification is received within 60 days of receipt of this request.

The NHDES-WD, Wastewater Engineering Bureau is the certifying authority. EPA has discussed this draft permit with the staff of the Wastewater Engineering Bureau and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 C.F.R. §§ 124.53 and 124.55.

The State's certification should include the specific conditions necessary to assure compliance with applicable provisions of the CWA, Sections 208(e), 301, 302, 303, 306, and 307 and with the appropriate requirements of State law. In addition, the State should provide a statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of State law. Since the State's certification is provided prior to permit issuance, any failure by the State to provide this statement waives the State's right to certify or object to any less stringent condition. These less stringent conditions may be established by EPA during the permit issuance process based on information received following the public notice of the draft permit. If the State believes that any conditions more stringent than those contained in the draft permit are necessary to meet the requirements of either the CWA or State law, the State should include such conditions and, in each case, cite the CWA or State law reference upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition.

Reviews and appeals of limitations and conditions attributable to State Certification shall be made through the applicable procedures of the State and may not be made through the applicable procedures set forth in 40 C.F.R. Part 124.

VII. Comment Period, Hearing Requests, and Procedures for Final Decisions.

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to:

Dan Arsenault
U.S. Environmental Protection Agency
One Congress Street
Suite 1100 (Mail Code CMP)
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1562
Fax: (617) 918-1505

Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issue proposed to be raised at the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after a public hearing (if applicable), the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

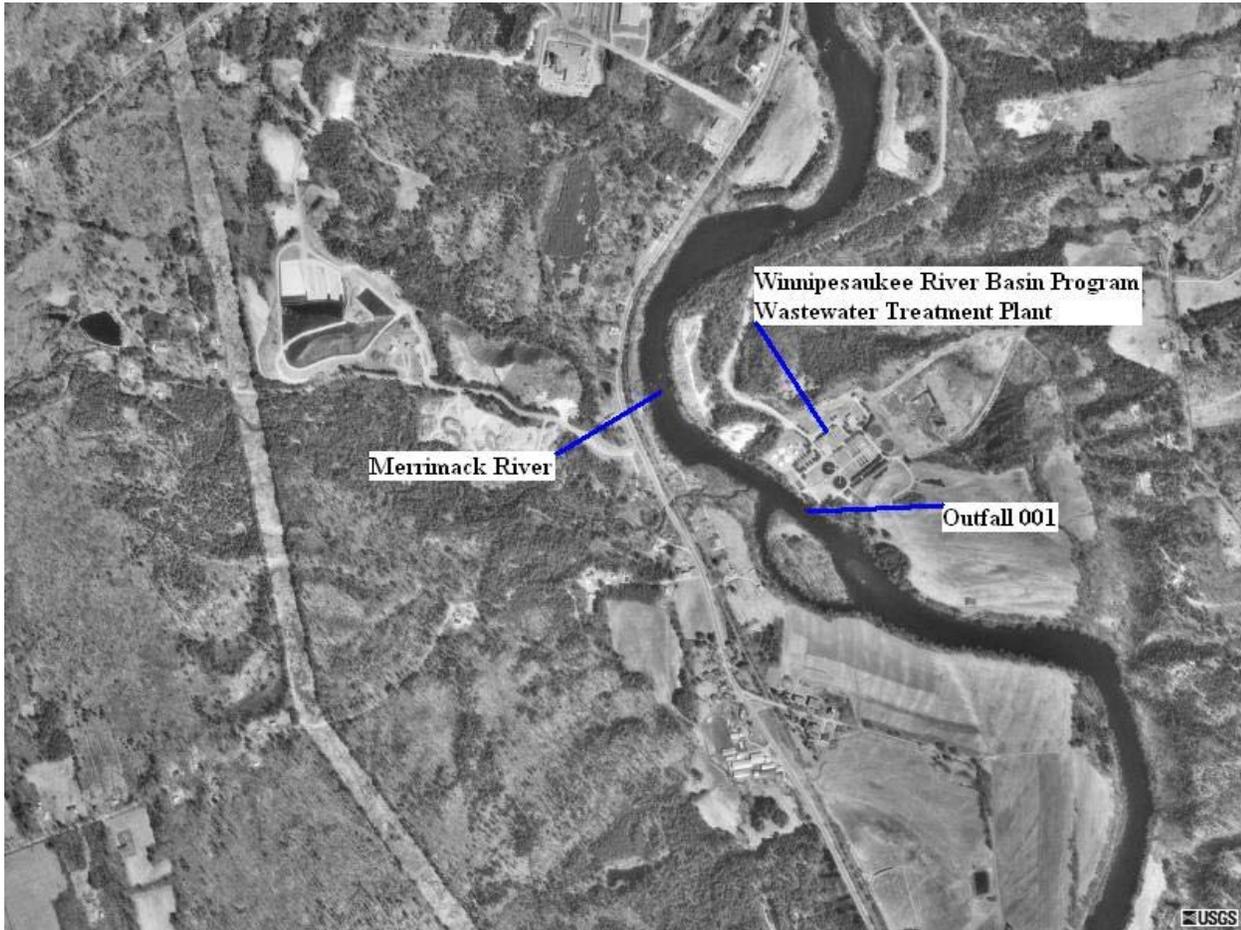
Information concerning the draft permit may be obtained between the hours of 9:00 am and 5:00 pm, Monday through Friday, excluding holidays.

Date

Stephen S. Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

ATTACHMENT A

**WINNIPESAUKEE RIVER BASIN PROGRAM WASTEWATER
TREATMENT PLANT LOCATION**



* Aerial photo taken April 12, 1998. Photo obtained through <http://www.terraserver.microsoft.com>.

ATTACHMENT B

SUMMARY OF EFFLUENT CHARACTERISTICS AT OUTFALL 001

The following effluent characteristics were derived from analysis of discharge monitoring data collected from Outfall 001 from January 2004 through July 2007. All data are taken from the monthly Discharge Monitoring Reports as retrieved from EPA's Integrated Compliance Information System (ICIS). These effluent values characterize the treated wastewater discharged from this facility.

Effluent Parameter	Average of Monthly Averages	Range of Monthly Averages	Maximum of Daily Maximums ¹
Flow (mgd)	6.598	4.466 – 11.114	27.008, 23.006, 16.531
CBOD ₅ (mg/l)	10	6 - 21	29, 27, 26
CBOD ₅ (lb/day)	560	307 - 1302	4664, 1825, 1542
TSS (mg/l)	12.9	7 – 24.9	33, 32.5, 31
TSS (lb/day)	698	315 - 1462	6315, 3270, 3041
pH (standard units) ²	---	6.4 – 7.7	---
<i>Escherichia coli</i> Bacteria (colonies/100ml)	15	2 – 67	651, 400, 337
Total Residual Chlorine (mg/l)	0.103	0.02 – 0.19	0.51, 0.44, 0.42
CBOD ₅ Removal (percent)	93.5	87 – 96	---
TSS Removal (percent)	94	89 – 97	---
LC50 (percent effluent) <i>Ceriodaphnia dubia</i>	---	---	100
LC50 (percent effluent) <i>Pimephales promelas</i>	---	---	100
Ammonia Nitrogen as Nitrogen (mg/l)	20.3	12.3 – 30.9	43.4, 35.7, 35.6
Hardness (mg/l)	---	---	140, 130, 120
Total Recoverable Cadmium (mg/l)	---	---	0.002, 0.001
Total Recoverable Chromium (mg/l)	---	---	0.004, 0.002
Total Recoverable Copper (mg/l)	---	---	0.035, 0.024, 0.023
Total Recoverable Nickel (mg/l)	---	---	0.027, 0.011, 0.008
Total Recoverable Lead (mg/l)	---	---	0.012, 0.011, 0.009
Total Recoverable Zinc (mg/l)	---	---	0.069, 0.059, 0.055

1. More than one value represents the second and third highest values.
2. Numbers listed are the minimum and maximum daily readings.

ATTACHMENT C

CBOD₅ AND TSS EFFLUENT MASS LIMIT CALCULATIONS

Concentration limits for CBOD₅ and TSS:

	Monthly Average	Weekly Average	Daily Maximum
CBOD₅	25 mg/l	40 mg/l	45 mg/l
TSS	30 mg/l	45 mg/l	50 mg/l

Plant Design Flow = 11.5 mgd = 11,500,000 g/d

Average Monthly CBOD₅ Mass Limit:

$$(25 \text{ mg/l})(11,500,000 \text{ g/d})(1 \text{ gram}/1000 \text{ mg})(1 \text{ lb}/ 454 \text{ gram})(3.785 \text{ l/g}) = \mathbf{2,400 \text{ lb/d}}$$

Average Weekly CBOD₅ Mass Limit:

$$(40 \text{ mg/l})(11,500,000 \text{ g/d})(1 \text{ gram}/1000 \text{ mg})(1 \text{ lb}/ 454 \text{ gram})(3.785 \text{ l/g}) = \mathbf{3,840 \text{ lb/d}}$$

Maximum Daily CBOD₅ Mass Limit:

$$(45 \text{ mg/l})(11,500,000 \text{ g/d})(1 \text{ gram}/1000 \text{ mg})(1 \text{ lb}/ 454 \text{ gram})(3.785 \text{ l/g}) = \mathbf{4,320 \text{ lb/d}}$$

Average Monthly TSS Mass Limit:

$$(30 \text{ mg/l})(11,500,000 \text{ g/d})(1 \text{ gram}/1000 \text{ mg})(1 \text{ lb}/ 454 \text{ gram})(3.785 \text{ l/g}) = \mathbf{2,880 \text{ lb/d}}$$

Average Weekly TSS Mass Limit:

$$(45 \text{ mg/l})(11,500,000 \text{ g/d})(1 \text{ gram}/1000 \text{ mg})(1 \text{ lb}/ 454 \text{ gram})(3.785 \text{ l/g}) = \mathbf{4,320 \text{ lb/d}}$$

Maximum Daily TSS Mass Limit:

$$(50 \text{ mg/l})(11,500,000 \text{ g/d})(1 \text{ gram}/1000 \text{ mg})(1 \text{ lb}/ 454 \text{ gram})(3.785 \text{ l/g}) = \mathbf{4,800 \text{ lb/d}}$$

ATTACHMENT D

DILUTION FACTOR CALCULATION

7Q10 Flow:

USGS Gage No. 01081500 on the Merrimack River at Franklin Junction, NH

Drainage Area = 1507 mi²

7Q10 Flow (Based upon data from 1943 – 2006) = 477.825 cfs

7Q10 Flow from USGS Gage to the plant outfall (Based upon Dingman Equation) = 0.341 cfs

7Q10 Flow Just Downstream of the plant outfall = 477.825 + 0.341 = 478.17 cfs

Dilution Factor:

$$\frac{Q_{001}}{(Q_{\text{Plant}} \times 1.547)} \times 0.9$$

where:

Q_{001} = 7Q10 flow of the Merrimack River at just downstream of Outfall 001 = 478.17 cfs

Q_{Plant} = Design flow of the treatment plant = 11.5 mgd

1.547 = Factor to convert mgd to cfs

0.9 = Factor to reserve 10% of the receiving water assimilative capacity

$$\frac{(478.17)}{(11.5 \times 1.547)} \times 0.9 = \mathbf{24.2}$$

ATTACHMENT E**AMMONIA CALCULATIONS**Acute Criteria and Limit:

Salmonids present:

$$\text{CMC} = \frac{0.275}{1 + 10^{7.204 - \text{pH}}} + \frac{39.0}{1 + 10^{\text{pH} - 7.204}}$$

Receiving water pH = 7.3 (from toxicity tests)

$$\text{CMC} = \frac{0.275}{1 + 10^{7.204 - 7.3}} + \frac{39.0}{1 + 10^{7.3 - 7.204}} = 0.15 + 17.35 = 17.5 \text{ mg/l}$$

Dilution Factor = 24.2

$$(17.5)(24.2) = 423.5 \text{ mg/l} \Rightarrow \text{acute threshold}$$

Highest discharge concentration = 43.4 mg/l => No limit necessary

Summer Chronic Criteria and Limit:

Early life stages present:

$$\text{CCC} = [(0.0577/1 + 10^{7.688 - \text{pH}}) + (2.487/1 + 10^{\text{pH} - 7.688})] \times \text{Min}(2.85, 1.45 \times 10^{0.028 \times (25 - T)})$$

Use summer time temperature of 25°C

$$\text{CCC} = [(0.0577/1 + 10^{7.688 - 7.3}) + (2.487/1 + 10^{7.3 - 7.688})] \times \text{Min}(2.85, 1.45 \times 10^{0.028 \times (25 - 25)})$$

$$\text{CCC} = [0.017 + 1.76] \times 1.45$$

$$\text{CCC} = 2.58 \text{ mg/l}$$

Dilution Factor = 24.2

$$(2.58)(24.2) = 62.4 \text{ mg/l} \Rightarrow \text{Summer chronic threshold}$$

Highest monthly average summer time concentration = 30.9 mg/l => No limit necessary

Winter Chronic Criteria and Limit:

Early life stages present:

$$CCC = [(0.0577/1 + 10^{7.688 - \text{pH}}) + (2.487/1 + 10^{\text{pH} - 7.688})] \times \text{Min}(2.85, 1.45 \times 10^{0.028 \times (25 - T)})$$

Use summer time temperature of 10°C

$$CCC = [(0.0577/1 + 10^{7.688 - 7.3}) + (2.487/1 + 10^{7.3 - 7.688})] \times \text{Min}(2.85, 1.45 \times 10^{0.028 \times (25 - 10)})$$

$$CCC = [0.017 + 1.76] \times 2.85$$

$$CCC = 5.08 \text{ mg/l}$$

Dilution Factor = 24.2

$$(5.06)(24.2) = 122.9 \text{ mg/l} \Rightarrow \text{Winter chronic threshold}$$

Highest monthly average winter time concentration = 25.9 mg/l => No limit necessary