UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I-NEW ENGLAND
ONE CONGRESS STREET
SUITE 1100
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.: **NH0100153**

NAME AND MAILING ADDRESS OF APPLICANT:

Town of Littleton
Town Hall
2 Union Street
Littleton, NH 003561

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Littleton Wastewater Treatment Plant
P.O. Box 413
323 Meadow Street
Littleton, NH 03561

RECEIVING WATER: **Ammonoosuc River (Hydrologic Basin Code: 01080101)**

CLASSIFICATION: **B**

Table of Contents

I. PROPOSED ACTION

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 Ammonoosuc River. The current permit was issued to the Town of Littleton, NH, authorizing the discharge of treated wastewater from the Littleton Wastewater Treatment Plant (WWTP) on May 12, 1999. This permit expired on June 11, 2004 and was administratively continued upon the timely submittal of a complete application by the permittee, pursuant to 40 CFR § 122.6

In response to the submission of the application for reissuance of the permit, EPA prepared and made available for public comment a draft permit and supporting fact sheet on May 30, 2007, and accepted comments on the proposed action through June 28, 2007. Since the close of the public comment period, the New Hampshire Department of Environmental Services (NHDES) notified EPA of a re-assessment of the available dilution in the receiving water in the vicinity of the Littleton WWTP's discharge outfall. The implication of this evaluation was the calculation of a lower dilution factor than the one used in the development of the draft permit released for public comment on May 30, 2007 (the "2007 draft permit"). Due to the extent to which the 2007 draft permit was modified as a result of applying the revised dilution factor, and also due to several other changes that were made to the 2007 draft permit, EPA has made a determination to re-notice the entire draft permit and fact sheet and re-open the public comment period. EPA will not respond to comments received on the 2007 draft permit in its final decision on this draft permit. The final permit and authorization to discharge shall expire at midnight, five (5) years from the effective date.

II. TYPE OF FACILITY AND DISCHARGE LOCATION

The Littleton WWTP is a publicly owned treatment works (POTW) which provides secondary treatment to sanitary wastewater collected from residences and a small number of industries in town through an activated-sludge process (specifically, through the use of oxidation ditches). The facility has a design flow of 1.5 million gallons per day (MGD). Raw wastewater enters the facility through a thirty-inch diameter interceptor. Bar screens and grit chambers provide preliminary treatment by removing any large, coarse objects from the waste stream that may damage treatment units further along the treatment process train. After passing a flow measurement device, wastewater is conveyed to the oxidation ditches where it mixes with microorganisms in the sludge and undergoes biological treatment. Aeration and mixing of the wastewater in the oxidation ditches facilitates contact between the wastewater and the activated sludge and provides the oxygen necessary to support the biological decay of the wastes. The wastewater is then conveyed from the oxidation ditches to one of two clariflocculators where the biological solids (sludge) settle out from the liquid portion (effluent) of the wastewater. Effluent then flows to an ultraviolet (UV) disinfection system and a flow measuring device prior to being discharged through outfall 001 to the Ammonoosuc River. Most of the settled sludge is returned to the oxidation ditches to seed the incoming wastewater, but a portion is wasted from the system and hauled off-site for disposal by New England Organics. The facility also has a hypochlorite (chlorine)

disinfection system which serves as a back-up to the UV system in the event of a system failure, or if the UV system is taken off-line for maintenance and/or repairs. The location of the Littleton WWTP and a process flow diagram are shown in **Figures 1** and **2**, respectively.

III. DESCRIPTION OF THE DISCHARGE

A quantitative description of the discharge in terms of significant effluent parameters can be found in **Appendices A, B, and C.**

IV. LIMITATIONS AND CONDITIONS

The draft permit contains effluent limitations for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), pH, *Escherichia coli* (*E. coli*), total residual chlorine, total recoverable copper, total recoverable lead, and whole effluent toxicity (WET). The proposed limitations and conditions, discussed in further detail in this fact sheet, can be found in Part I of the draft permit.

V. 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) and (2)).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits, technology-based effluent limitations and water quality-based effluent limitations (see CWA §§ 301, 303, and 304(b)). Also see 40 CFR § Parts 122, 125, and 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 which are based upon secondary treatment. The secondary treatment technology guidelines (effluent limits) consist of effluent limitations for BOD_5, TSS, and pH (see 40 CFR Part 133). Water quality-based effluent limitations are developed and incorporated into NPDES discharge permits to ensure that state water quality standards are met regardless of the decision made with respect to technology and economics

in establishing technology-based limits. In particular, Section 301(b)(1)(C) of the CWA 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 CFR §§ 122.4(d) and 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 40 CFR § 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 (see CWA § 303). Water quality standards consist of three elements: (1) one or more designated use for each waterbody or waterbody 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 waterbody without impairing the designated use(s) of that waterbody; and (3) an antidegradation provision focused on protecting high quality waters and protecting and maintaining the level of water quality necessary to protect existing uses (CWA § 303(c)(2)(a) and 40 CFR § 131.12). The limits and conditions contained within the draft permit reflect the goal of the CWA and EPA to achieve and then to maintain water quality standards within the receiving water.

The applicable state water quality standards can be found in the New Hampshire Surface Water Quality Regulations, Chapter Env-Ws 1700 et seq. See generally, Title 50, Water Management and Protection, Chapter 485A, Water Pollution and Waste Disposal Section 485-A. These regulations were adopted on December 3, 1999 and became effective on December 10, 1999.

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 permits limits, both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable instream pollutant concentrations. Acute and chronic aquatic life criteria are generally implemented through maximum daily limits and average monthly limits, respectively. 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 the reasonable potential to cause or contributes to a violation of a narrative criterion within a water quality standard, the permitting authority must establish limits in one or more of the following ways: (1) 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 uses; (2) on a case-by-case basis using water quality criteria published under CWA § 304(a), supplemented as necessary by other relevant information; or (3) in certain circumstances, based on an indicator parameter (40 CFR § 122.44(d)(1)(vi)(A-C)).

Under Section 301(b)(1) of the CWA, POTWs must have achieved effluent limitations based upon secondary treatment by July 1, 1977. Since all statutory deadlines for meeting technology-based effluent limitations established pursuant to the CWA have expired, the deadline for compliance with technology-based effluent limits for a POTW is the date of

permit issuance (40 CFR § 125.3(a)). Extended compliance deadlines cannot be authorized by a NPDES permit if statutory deadlines have passed. The federal regulations governing EPA's NPDES program are generally found in 40 CFR Parts 122, 124, and 136.

B. Introduction

Pursuant to 40 CFR § 122.44(d)(1), NPDES permits must contain any requirements in addition to technology-based limits necessary to achieve water quality standards established under Section 303 of the CWA, including state narrative criteria for water quality. In addition, limitations "must control any pollutant or pollutant parameter (conventional, non-conventional, or toxic) that the Director has determined are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including State narrative criteria for water quality (40 CFR § 122.44(d)(1)(i)). An excursion occurs if the actual or projected instream concentration exceeds the applicable criterion.

The Littleton WWTP discharges treated effluent to the Ammonoosuc River, which is classified by the State of New Hampshire as a Class B water. Class B waters shall be of the second highest quality and shall have no objectionable physical characteristics, and shall contain a dissolved oxygen content of at least 75 percent saturation (see RSA 485-A:8, II). Class B waters are classified as having the following designated uses: the protection and propagation of aquatic life and wildlife, for swimming and other recreational purposes, and, after treatment, for water supplies.

Sections 305(b) and 303(d) of the CWA require that states complete a water quality inventory and develop a list of impaired waters. Specifically, 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-based controls, and as such, require the development of a Total Maximum Daily Load (TMDL) for each pollutant that is prohibiting a designated use(s) from being attained. The results of the 305(b) assessments are used in the development of the State of New Hampshire's 303(d) lists, which are published every two years and identify the water bodies which are not meeting (or are not expected to meet) water quality standards, any designated use(s) which is impaired as well as the pollutant(s) causing the impairment(s).

The segment of the Ammonoosuc River in which the Littleton WWTP discharges treated wastewater (Assessment Unit ID: NHRIV801030403-11), is identified in the State of New Hampshire Final 2006 and 2008 Section 303(d) Surface Water Quality Lists (NHDES 2006 and 2008) as not meeting the primary contact recreation designated use (i.e., this use is impaired). The pollutant listed as causing the impairment and requiring the development of a TMDL is *Escherichia coli* (*E. coli*). The source of the pollutant is listed as unknown. A TMDL for *E. coli* for this segment of the Ammonoosuc River is scheduled for completion in the year 2016 (State of New Hampshire Final 2006 and 2008 Section 303(d) Surface Water Quality Lists (NHDES 2006 and 2008)). In the absence of a TMDL, EPA is required to use available information to establish water quality limits when issuing NPDES permits to

facilities which discharge to impaired waters. See generally 40 CFR §122.44 (d). The limitations and conditions in the draft permit have been developed to ensure protection of all of the designated uses in the receiving water.

1. Reasonable Potential

In determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion above a narrative or numeric criterion within a state water quality standard, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) the variability of the pollutant or pollutant parameter in the effluent; (3) the sensitivity of the species to toxicity testing; (4) where appropriate, the dilution of the effluent in the receiving water; and (4) the statistical approach outlined in the *Technical Support Document for Water Quality-based Toxics Control, Section 3* (USEPA, March 1991 [EPA/505/2-90-001]) (see also 40 CFR § 122.44(d)(1)(ii)). In accordance with New Hampshire's Water Quality Standards (RSA 485-A:8 VI, Env-Ws 1705.02), the 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 flow) for aquatic life and human health criteria for non-carcinogens, or the long-term harmonic mean flow for human health criteria (for carcinogens only) in the receiving water at the point just upstream of the outfall. Furthermore, ten 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).

2. 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. EPA has also promulgated anti-backsliding requirements which are found at 40 CFR § 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. The limitations and conditions contained within the draft permit satisfy the antibackslidding requirements of 40 CFR § 122.44(l).

3. 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 limitations 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 CFR § 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 CFR § 124.55(a)(2)).

C. Design Flow

The Littleton WWTP has a design flow of 1.5 MGD, which was used in the calculation of effluent limitations for total residual chlorine, total recoverable copper, total recoverable lead, whole effluent toxicity, and the mass-based limits for BOD_5 and TSS, in accordance with the requirements found at 40 CFR § 122.45(b).

The draft permit maintains the requirement in the current permit for the permittee to submit to EPA and NHDES a projection of loadings, a program for maintaining satisfactory treatment levels, and plans for facility improvements whenever the effluent flow exceeds 80 percent of the facility's design flow capacity for three consecutive months. The draft permit also includes a reporting requirement for the average monthly and maximum daily flows.

D. Conventional pollutants

1. Five-Day Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS)

The draft permit contains average monthly and average weekly effluent limitations for BOD_5 and TSS of 30 mg/l and 45 mg/l, respectively. These limitations are based on the secondary treatment regulations for POTWs found at 40 CFR § 133.102(a) and (b). The 50 mg/l maximum daily limitations for BOD_5 and TSS in the current permit have been maintained in the draft permit. In accordance with the requirements of 40 CFR 122.45(f), the draft permit also contains average monthly (375 lbs/day), average weekly (413 lbs/day), and maximum daily (459 lbs/day) mass-based limits for BOD_5 and TSS (see **Appendix E**). The concentration and mass limitations for BOD_5 and TSS in the draft permit are the same as those in the current permit and are therefore consistent with the antibacksliding requirements of 40 CFR § 122.44(l).

Effluent monitoring data submitted by the permittee from 2005-2008 indicate that the concentration and mass limitations for BOD_5 and TSS in the current permit have been consistently met (see **Appendix A**).

In accordance with the provisions of 40 CFR § 133.102(a)(4)(iii), the draft permit requires that the 30-day average percent removal of BOD_5 and TSS be no less than 85%.

2. pH

The limitations for pH in the draft permit are based upon state certification requirements and the state's water quality standards for Class B waters established at RSA 485-A:8 II, requiring that "The pH range for said (Class B) waters shall be 6.5-8.0 except when due to natural causes." The pH limitations in the draft permit are the same as those in the current permit in keeping with the antibacksliding requirements of 40 CFR § 122.44(l) and are at least as stringent as the requirements of 40 CFR § 133.102(c). The permittee shall continue to monitor the pH of the effluent once per day.

The current permit contains a special condition which allows for a change in the pH limitation to outside of 6.5 to 8.0 Standard Units (SU) when certain conditions are met (i.e., such a change would be considered if the permittee demonstrates to the satisfaction of the NHDES-WD that the instream water quality standard for pH would be protected when the discharge is outside of the permitted range). Because segments of the receiving water upstream and downstream from the segment in which the discharge occurs are listed as impaired due to pH in the State of New Hampshire Final 2008 Section 303(d) Surface Water Quality List (NHDES 2008)), the draft permit does not allow for any adjustment of the pH limit to outside of the range specified in the state water quality standards (6.5 – 8.0 SU).

Effluent monitoring data submitted by the permittee from August 2005 – August 2008 indicate that the pH of the effluent has consistently been within the range of 6.5 – 8.0 S.U. (see **Appendix A**).

3. *Escherichia coli (E. coli)*

The *E. coli* limitations in the current permit have been maintained in the draft permit, in keeping with the antibacksliding requirements of 40 CFR § 122.44(l). The limitations for *E. coli* in the draft permit are a geometric monthly mean (average monthly limit) of 126 colony forming units per 100 milliliters (cfu/ml) and a maximum daily limit of 406 cfu/100 ml, which are based on the water quality standards for Class B waters (non-designated beach areas) found at RSA 485-A:8 II.

The primary contact recreation designated use for the segment of the Ammonoosuc River into which the Littleton WWTP discharges treated effluent (NHRIV801030403-11) is listed as impaired due to *E. coli* in the State of New Hampshire Final 2006 and 2008 Section 303(d) Lists (NHDES 2006 and 2008). The source(s) of the pollutant are listed as unknown. Effluent monitoring data submitted by the permittee from August 2005 - August 2008 indicate that the *E. coli* limitations in the current permit were violated on one occasion (September 2006), when the average monthly quantity of *E. coli* in the effluent was 135 cfu/ml (therefore exceeding the 126 cfu/ml average monthly limit in the current permit. See **Appendix A**). The limitations and conditions in the draft permit are sufficiently stringent so as to ensure that discharges of treated effluent from the Littleton WWTP do not cause or contribute to this impairment.

The permittee shall continue to monitor the effluent for *E. coli* at a frequency of three times per week. The draft permit also requires *E. coli* samples to be collected concurrently with total residual chlorine samples when the chlorination system is in use.

E. Available Dilution, Non-conventional and Toxic Pollutants

Water quality-based effluent limitations for specific toxic pollutants are based on numeric chemical-specific criteria derived from extensive scientific studies. EPA has summarized and published toxicity criteria for specific toxic pollutants in the *Quality Criteria for Water* (USEPA 1986 [EPA440/5-86-001]), commonly referred to as the "Gold Book". The Gold

Book includes acute aquatic life criteria (to protect against the effects of short-term exposure, such as death) and chronic aquatic life criteria (to protect against the effects of long-term exposure, such as impaired growth). The State of New Hampshire adopted the Gold Book criteria (with certain exceptions) into the state's surface water quality regulations on December 3, 1999 (see Env-Ws 1703.21). EPA uses the pollutant-specific criteria contained within the Gold Book (and adopted by the State of New Hampshire) along with the available dilution in the receiving water in the development of water quality-based effluent limitations.

1. Available Dilution

Water quality-based effluent limitations are established based on a calculated dilution factor derived from the available dilution in the receiving water at the point of discharge. The dilution factor is derived from the design flow of the facility and the mean low flow over seven consecutive days, with a recurrence interval of once in every ten years (the 7Q10 flow) in the receiving water. The available dilution is then reduced by 10% to account for the state's assimilative capacity reserve rule (see Env-Ws 1705.01).

The dilution factor used to calculated water quality-based limitations in the current permit was 8.2. A dilution factor of 6.14, based upon the updated calculation of the 7Q10 flow in the receiving water, was used in the development of the draft permit, as described below.

7Q10 Flow

The Littleton WWTP is located about 10 miles downstream of a United States Geological Survey (USGS) stream flow gaging station (gage No. 01137500, Ammonoosuc River at Bethlehem Junction) and approximately three miles downstream of the Apthorp Dam (a Federal Energy Regulatory Commission (FERC) licensed hydroelectric facility (NH00611). The FERC license was reissued on October 17, 1995, with a specified minimum flow requirement of 90 cubic feet per second (cfs) or at least 90 percent of the inflow. In situations where "at least 90 percent of inflow" appears in a FERC license, EPA and the NHDES use 90 percent of the 7Q10 inflow to determine a corresponding flow value with the lower flow being used to determine the available dilution for the development of permit limits.

In determining the available dilution in the Ammonoosuc River at the point of discharge, the 7Q10 flow in the river at the Bethlehem Junction USGS gaging station was calculated using Log-Pearson Type III statistics, based on the full period of record for the station (1941 to 2006). The results are as follows:

Bethlehem Junction Gage 7Q10 = 26.97 cfs

Next, an empirical equation developed by Dingman[1], which estimates 7Q10 stream flows in un-gaged, unregulated streams in New Hampshire and Vermont as a function of watershed

[1] Dingman, S.L., and S.C. Lawlor, 1995. Estimating Low-Flow Quantiles from Drainage-Basin Characteristics in New Hampshire and Vermont, American Water Resources Association, Water Resources Bulletin, pp. 243-256.

characteristics, was used to calculate the 7Q10 streamflow for the watershed area downstream from the gaging station. The formula variables are watershed (basin) area, mean basin elevation, and the percent of the basin underlain by coarse-grained stratified drift in contact with streams. The "Dingman" equation was used to estimate the 7Q10 stream flows for the following two sub watershed areas[2]:

Sub-watershed	7Q10 Flow
a. Between the Bethlehem Junction gage and Apthorp Dam	2.167 cfs
b. Between the Bethlehem Junction gage and the Littleton WWTP (ungaged area)	3.082 cfs

In considering consumptive water uses, the NHDES Registered Water User Database indicates there is one surface water withdrawal and one surface water discharge in the watershed between the Bethlehem Junction gage and Apthorp Dam:

Withdrawal - Pinetree Power Water Withdrawal	0.43 cfs
Discharge - Bethlehem WWTF Discharge (source is outside the watershed)	0.32 cfs
Net withdrawal	0.11 cfs

The Water User database indicates that there are no active water withdrawals between the Apthorp Dam and the Littleton WWTP.

The Apthorp Dam is required by its FERC license to release at least 90 percent of the inflow into the reservoir. The 7Q10 flow in the Ammonoosuc River downstream from the Apthorp Dam was calculated as follows:

90 % of the inflow [Bethlehem Gage 7Q10 + Ungaged Area 7Q10 – Net Water Withdrawals] = 0.9 x [26.97 cfs + 2.167 cfs – 0.11 cfs] = 26.12 cfs

Discounting the requirement for the release of at least 90 % of the inflow into the reservoir by the Apthorp Dam, the 7Q10 flow at this location would be calculated as follows:

Bethlehem Gage 7Q10 + Ungaged Area 7Q10 – Net Water Withdrawals
= 26.97 cfs + 2.167 cfs – 0.11 cfs = 29.03 cfs

Based on the above, when the reservoir is being filled, it is estimated that the Apthorp Dam can result in a net flow reduction of 2.91 cfs under 7Q10 flow conditions.

---

[2] The 7Q10 values calculated using USGS gaging station records indicate that under 7Q10 conditions there is a significant difference between the yields (cfs per square mile, or cfsm) for the Bethlehem Junction Gage watershed, which is 0.31 cfsm, compared to the yield in the entire Bath Gage watershed, which is 0.16 cfsm. Given this difference, using the Dingman equation to calculate the 7Q10 for the sub-watershed between the upstream gage and the Littleton WWTP is more appropriate than using simple watershed area ratios because the Dingman equation includes additional watershed variables, which allows for more accurate estimation of 7Q10 stream flow. [For example, the Dingman equation predicts a 7Q10 at the Bath Gage equal to 65.9 cfs, while the gaging records indicate that the 7Q10 there is 63.5 cfs. Conversely, using watershed area ratios and the Bethlehem Junction Gage 7Q10 would result in an estimated Bath Gage 7Q10 of 122 cfs.]

The 7Q10 flow of the Ammonoosuc River at the Littleton WWTP was then calculated as follows:

> Bethlehem Gage 7Q10 + Ungaged Area 7Q10 – Flow Reduction due to Apthorp Dam – Net Water Withdrawals
>
> = (26.97 cfs + 3.082 cfs) – 2.91 cfs – 0.11 cfs = 27.03 cfs

In accordance with the 7Q10 policy, Littleton's water supply is from outside the watershed, so the above 7Q10 is assumed to be upstream of the WWTP's discharge outfall.

Dilution Factor

An island near the Littleton WWTP essentially divides the flow of the Ammonoosuc River in half. Based on the assumption that one half (0.5) of the 7Q10 flow passes by the WWTP outfall, the 1.5 MGD (1.5 MGD * 1.547 = 2.3205 cfs) design flow of the facility, and accounting for 90% (0.9) of the river's assimilative capacity (therefore reserving 10 % for future needs, in accordance with the requirements of Env-Ws 1705.01), a dilution factor of 6.14 was calculated as shown below.

> Dilution Factor = 0.9 [0.5 (27.03 cfs) + 2.3205 cfs)]/(2.3205 cfs) = 6.14

2. Total Residual Chlorine

The average monthly and maximum daily limitations for total residual chlorine (TRC) in the current permit (0.090 mg/l and 0.156 mg/l, respectively) were based upon the acute and chronic aquatic life criteria specified in the state's water quality standards and a dilution factor of 7.75. As a result of the revised dilution factor, the maximum daily and average monthly limits for TRC proposed in the draft permit are 67 µg/l and 117 µg/l, respectively. These limits were determined by multiplying the acute and chronic aquatic life criteria for TRC specified in the State's water quality standards (19 µg/l and 11 µg/l, respectively [see Env-Ws. 1703.21, Table 1703.1]) by the dilution factor, as shown below.

Maximum Daily Limit (acute) = 19 µg/l * 6.14 = 117 µg/l

Average Monthly Limit (chronic) = 11 µg/l * 6.14 = 68 µg/l

Because the facility's hypochlorite disinfection system will only be used when the UV disinfection system fails or needs to be taken out of service for maintenance or repair, the TRC limitations and monitoring requirements in the draft permit are only in effect when the hypochlorite system is in use.

3. Lead

The risk of toxicity posed by lead in freshwater systems is related to the hardness of the water, with increasing hardness resulting in decreased toxicity. Therefore, water quality criteria for lead are dependent upon the hardness of the water in which the criteria are being applied.

The acute and chronic freshwater aquatic life criteria for lead specified in the New Hampshire Water Quality Standards are 14 µg/l and 0.54 µg/l, respectively (see Env-Ws 1703.21, Table 1. Also see **Appendix F**). The results of analyses conducted on samples of the receiving water in conjunction with whole effluent toxicity (WET) tests from 2005-2008 indicate that the ambient hardness is less than 25 mg/l calcium carbonate ($CaCo_3$). Therefore, in accordance with the state water quality standards, a hardness value of 25 mg/l was used in the determination of water quality criteria in the receiving water (see Env-Ws 1703.21, Table 1703.1, footnote f).

Metals can be present in both dissolved and particulate forms in the water column. However, extensive studies suggest that it is the dissolved fraction that is biologically available, and therefore presents the greatest risk of toxicity to aquatic life inhabiting the water column. This conclusion is widely accepted by the scientific community both within and outside of EPA (*Water Quality Standards Handbook: Second Edition*, Chapter 3.6 and Appendix J, EPA 1994 [EPA 823-B-94-005a]). Also see http://www.epa.gov/waterscience/standards/handbook/chapter03.html#section6). As a result, water quality criteria are established in terms of dissolved metals. Although many inorganic components of domestic wastewater, including metals, are in the particulate form, differences in the chemical composition between effluent and receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007])[3]. Therefore, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Therefore, effluent limits for metals are expressed as total recoverable metals in accordance with the requirements of 40 CFR § 122.45(c). The total recoverable concentration of a metal is a measure of both the dissolved and particulate fraction. In order to establish total recoverable limits that will ensure attainment of dissolved aquatic life criteria, conversion factors have been developed to reflect the partitioning of

[3] *The MetalsTranslator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]) was used as the basis for the use of the criteria conversion factor (CF). National Guidance requires that permits limits for metals are to be expressed in terms of total recoverable metal and not dissolved metal. As such, conversion factors are used to develop total recoverable limits from dissolved criteria. The conversion factor reflects how the discharge of a particular metal partitions between the particulate and dissolved form after mixing with the receiving water. In the absence of site-specific data describing how a particular discharge partitions in the receiving water, a default assumption equivalent to the criteria conversion factor is used in accordance with guidance.

metals as the effluent mixes with the receiving water, allowing for the translation between a dissolved criterion and a total recoverable limit (and vice-versa). These conversion factors are the fraction of the total recoverable metal in the effluent that will be in the dissolved form in the receiving water (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]). Conversion factors for translating dissolved criteria into total recoverable limits are found in the New Hampshire water quality standards at Env-Ws 1703.21, Table 1703.2 (also see *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]. Also see **Appendix F**). Dividing the dissolved acute and chronic criteria for lead by the applicable conversion factor (0.993) and then multiplying those values by the dilution factor (6.14) yields the maximum concentrations of total recoverable lead (i.e., effluent limits) that may be discharged without resulting in the criteria being exceeded, as shown below (also see **Appendix F**).

Maximum Daily (Acute) Concentration = (14 µg/l * 6.14)/0.993 = 87 µg/l (0.087 mg/l)

Average Monthly (Chronic) Concentration = (0.54 µg/l * 6.14)/0.993 = 3.3 µg/l (0.0033 mg/l)

The results of lead analyses conducted on samples of the effluent in conjunction with whole effluent toxicity (WET) tests from June 2005 to June 2008 show that the concentration of lead in the effluent ranged from 0.005 mg/l (5 µg/l) to 0.72 mg/l (720 µg/l), which indicates that reasonable potential exists for the discharge to cause or contribute to an excursion above the acute and chronic water quality criteria for lead in the receiving water (see **Appendices C and F).** In order to ensure that water quality standards will be met in the downstream receiving water at all times, the draft permit includes chronic and acute limitations for lead, which have been set at 3.3 µg/l and 87µg/l, respectively, in accordance with the water quality standards found at Env-Ws 1703.21 and the requirements of 40 CFR § 122.44(d)(1) and § 122.45(c).

The monitoring frequency for lead proposed in the draft permit is once per week. The results of lead analyses conducted on samples of the effluent in conjunction with WET testing may be used to satisfy one of the twice per month monitoring requirements for the particular week/month in which the WET test analysis was performed.

4. Copper

As with lead, the risk of toxicity posed by the presence of copper in fresh water systems is a function of the hardness of the water in which it is found. Likewise, water quality criteria for copper are dependent upon the hardness of the water in which the criteria are being applied. The acute and chronic freshwater aquatic life criteria for copper specified in the New Hampshire Water Quality Standards are 3.6 µg/l and 2.7 µg/l, respectively (see Env-Ws 1703.21, Table 1. Also see **Appendix F**). As discussed in Part V.E.3 of this fact sheet, these criteria are based on a hardness value of 25 mg/l $CaCo_3$, in accordance with New Hampshire's water quality standards (see Env-Ws 1703.21, Table 1703.1, footnote f).

Dividing the dissolved acute and chronic copper criteria by the applicable conversion factor (0.960) and then multiplying that value by the dilution factor (6.14) yields the maximum concentrations of total recoverable copper (i.e., effluent limits) that may be discharged without resulting in an excursion above the criteria in the receiving water, as shown below (see Env-Ws 1703.21, Tables 1 and 2. Also see **Appendix F**). See Part V.E.3. of this fact sheet for an explanation of the conversion factors applied to dissolved metals criteria when calculating total recoverable metals permit limits.

Maximum Daily (Acute) Concentration = (3.6 µg/l * 6.14)/0.960 = 23 µg/l (0.023 mg/l)

Average Monthly (Chronic) Concentration = (2.7 µg/l * 6.14)/0.960 =17 µg/l (0.017 mg/l)

The results of copper analyses conducted on samples of the effluent in conjunction with whole effluent toxicity (WET) tests from June 2005 to June 2008 show that the concentration of copper discharged from the facility ranged from 0.002 mg/l (2.0 µg/l) to 0.024 mg/l (24 µg/l), indicating that there is reasonable potential for the discharge to cause or contribute to a violation of water quality standards in the receiving water (**Appendix C**). Therefore, the draft permit includes acute and chronic effluent limits for total recoverable copper, which have been set at 23 µg/l and 17 µg/l, respectively, in order to ensure that water quality standards will be met in the receiving water at all times, in accordance with the requirements of 40 CFR § 122.44(d)(1), § 122.45(c), and Env-Ws 1703.21.

The sampling frequency for total recoverable copper proposed in the draft permit is twice per month. The results of copper analyses conducted on samples of the effluent in conjunction with WET testing may be used to satisfy one of the twice per week monitoring requirements for the particular week in which the WET test analysis was performed.

5. Nitrogen

In December 2000, the Connecticut Department of Environmental Protection (CT DEP) completed a Total Maximum Daily Load (TMDL) for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a Waste Load Allocation (WLA) for point sources and a Load Allocation (LA) for non-point sources. The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater treatment facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25% reduction from the baseline total nitrogen loading estimated in the TMDL.

The baseline total nitrogen point source loadings estimated for the Connecticut, Housatonic, and Thames River watersheds were 21,672 lbs/day, 3,286 lbs/day, and 1,253 lbs/day respectively (see **Table 1**). The estimated current point source total nitrogen loadings for the Connecticut, Housatonic, and Thames Rivers, respectively, are 13,836 lbs/day, 2,151 lbs/day, and 1,015 lbs/day, based on recent information and including all POTWs in the watershed. The following table summarizes the estimated baseline loadings, TMDL target loadings, and

estimated current loadings:

Table 1 Estimated Point Source Nitrogen Loadings to the Connecticut, Housatonic and Thames Rivers Watersheds

Basin	**Baseline Loading[1] lbs/day**	**TMDL Target[2] lbs/day**	**Current Loading[3] lbs/day**
Connecticut River	21,672	16,254	13,836
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	**26,211**	**19,657**	**17,002**

1. Estimated loading from TMDL, (see Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound", April 1998)
2. Reduction of 25% from baseline loading
3. Estimated current loading from 2004 – 2005 DMR data (a detailed summary of data) can be found in **Appendix D**.

The TMDL target of a 25 percent aggregate reduction from baseline loadings is currently being met, and the overall loadings from MA, NH, and VT wastewater treatment plants discharging to the Connecticut River watershed has been reduced by approximately 36 percent.

In order to ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25% reduction over baseline loadings, EPA has included a condition in NPDES permits issued to existing wastewater treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic, and Thames River watersheds, requiring the permittees to evaluate alternative methods of operating their treatment plants to optimize the removal of nitrogen, and to describe previous and ongoing optimization efforts. Facilities not currently engaged in optimization efforts will also be required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase, and that the aggregate 25% reduction required by the TMDL is maintained. Such a requirement has been included in the draft permit. EPA also intends to work with the State of Vermont to ensure that similar requirements are included in its discharge permits.

Specifically, the draft permit requires an evaluation of alternative methods of operating the existing wastewater treatment facility in order to control total nitrogen levels, including, but not limited to, operational changes designed to enhance nitrification (seasonal or year round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. This evaluation is required to be completed and submitted to EPA and the NHDES **within one year of the effective date** of the permit, along with a description of past and ongoing optimization efforts. The permit also requires implementation of optimization methods sufficient to ensure that there is no increase in the quantity of total nitrogen discharged from the facility compared to the existing average daily load. The annual average total nitrogen load from this facility (2004 – 2005) is estimated to be 73.832 lbs/day (see

Appendix D). The draft permit requires annual reports to be submitted that summarize progress and activities related to optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years. The draft permit also includes a requirement for the facility to be operated in such a way that discharges of total nitrogen are minimized. In addition, average monthly and maximum daily reporting requirements for total nitrogen (TN), ammonia nitrogen (NH_3), total Kjeldahl nitrogen (TKN), total nitrite nitrogen (NO_2) and total nitrate nitrogen (NO_3) have also been included in the draft permit.

The agencies will annually update the estimate of all out-of-basin nitrogen loads and may incorporate total nitrogen limits in future permit modifications or reissuances as may be necessary to address increases in discharge loads, a revised TMDL, or other new information that may warrant the incorporation of numeric permit limits. There have been significant efforts by the New England Interstate Water Pollution Control Commission (NEIWPCC) work group and others since the completion of the 2000 TMDL, which are anticipated to result in revised wasteload allocations for in-basin and out-of-basin facilities. Although not a permit requirement, it is recommended that any facilities planning that might be conducted for this facility should consider alternatives for further enhancing nitrogen reduction.

F. Whole Effluent Toxicity

EPA's *Technical Support Document for Water Quality Based Toxics Control* (USEPA 1991 [EPA/505/290-001]) 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 the nation's waterways. EPA-Region I adopted this "integrated strategy" on July 1, 1991, for use in permit development and issuance. These approaches are designed to protect both aquatic life and human health. Pollutant-specific approaches such as those found 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 combination 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 found at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when reasonable potential exists for a discharge to cause or contribute to an excursion above state narrative criteria for toxicity. Furthermore, the results of toxicity tests may be used to demonstrate compliance with the "no toxics in toxics amounts" requirement found in both the CWA and in the State of New Hampshire's regulations.

The current policy of EPA-Region I is to require toxicity testing in all NPDES permits issued to POTWs. The type of whole effluent toxicity test(s) (acute and/or chronic) and the effluent limitation(s) required by the permit are based on the available dilution in the receiving water at the point of discharge. NPDES permits issued to municipal dischargers (i.e., POTWs) having a dilution factor less than ten typically include acute (LC_{50}) and Chronic (C-NOEC) WET limits and require that WET tests be conducted using the daphnid, *Ceriodaphnia dubia* (*C. dubia*) and the fathead minnow, *Pimephales promelas* (*P. promelas*) as the test organisms. The acute limit (LC_{50}) is the percentage of effluent in a sample that must not cause more than a 50% mortality rate in the test organisms. Therefore, an acute (LC_{50}) limit of 100% means that a sample of 100% effluent (no dilution) shall be lethal to no more than 50% of the test organisms. The Chronic-No Observed Effect Concentration (C-NOEC) is defined as the highest concentration of toxicant or effluent to which test organisms are exposed in a life cycle or partial life cycle test, which causes no adverse effect on growth, survival or reproduction during a specific time of observation determined from hypothesis testing where the test results exhibit a linear dose-response relationship.

The current permit contains an LC_{50} limit of 100 % and a C-NOEC limit of ≥ 12.2 %, which was based on a dilution factor of 7.75. Taking the re-calculated dilution factor of 6.14 into consideration, the LC_{50} limit in the current permit (100 %) has been maintained in the draft permit. The C-NOEC limitation is derived from the instream waste concentration (IWC) of the effluent, which is the inverse of the dilution factor (DF). The IWC is multiplied by 100 % to determine the C-NOEC limit, as shown below.

$$IWC = (1/DF) = (1/6.14 = 0.163$$
$$C\text{-}NOEC = IWC * 100\ \% = 0.163 * 100\ \% = 16.3\ \%.$$

Therefore, a chronic (C-NOEC) WET limit of ≥ 16.3 % is proposed in the draft permit. Samples for use in WET tests shall be collected and the tests completed by the quarters ending March 31st, June 30th, September 30th, and December 31st, using the daphnid, *Ceriodaphnia dubia* (*C. dubia*) and the fathead minnow, *Pimephales promelas* (*P. promelas*) as test organisms.

The draft permit includes a special condition which would allow for a reduction in the frequency of toxicity testing to not less than once per year, after the completion of a minimum of the most recent four successive toxicity tests of the effluent, all of which must be valid tests and demonstrate compliance with the permit limits for whole effluent toxicity (See Part I.F.1. (Special Conditions – WET Test Frequency Adjustment) of the draft permit). Any requests for toxicity testing frequency reduction must be made to EPA-Region I in writing. The permittee is required to continue WET testing at the frequency specified in the draft permit until the permit is either formally modified or until the permittee receives a certified letter from EPA-Region I granting a change in the testing frequency. If the results of WET tests indicate that the discharge presents a risk of toxicity, the monitoring frequency and/or 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 that the New Hampshire water quality standards are not adequately enforced and users 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 time of permit development"; therefore, the permitting authority is allowed to use said information to modify an issued permit under the authority granted in 40 C.F.R. §122.62(a)(2).

Additional Analyses

The current permit includes a requirement for the reporting of several selected parameters, the results of which are determined through analyses conducted on samples of the 100 percent effluent sample in conjunction with WET tests. Specifically, the current permit includes analysis and reporting requirements for hardness, ammonia nitrogen; and total recoverable aluminum, cadmium, chromium, copper, nickel, lead and zinc.

Certain metals that may be present in the effluent discharged from POTWs can be toxic to aquatic life. The risk of toxicity associated with some metals, such as copper, lead, zinc, nickel, cadmium and chromium, are dependent upon the hardness of the water in which they are present, with an increase in the hardness of the water resulting in a decrease in the toxicity of the metal. Acute and chronic freshwater criteria for these metals are shown in **Appendix F** (also see the New Hampshire Water Quality Standards at Env-Ws 1703.21, Table 1703.1). The maximum allowable concentrations of these metals that can be present in the discharge are shown in **Appendix F**. Although The results of metals analyses conducted on samples of the effluent in conjunction with WET tests from June 2005 through June 2008 do not indicate reasonable potential for the discharge to cause or contribute to an excursion above water quality criteria for aluminum, zinc, nickel, cadmium and chromium, there is reasonable potential for the discharge to cause or contribute to exceedances of water quality criteria for lead and copper in the receiving water downstream (**Appendix C**). Therefore, limitations for total recoverable lead and copper have been proposed in the draft permit (see Part V.E.3 and 4 of this fact sheet).

The draft permit maintains the requirement in the current permit for the analysis of hardness, total ammonia nitrogen as nitrogen, and total recoverable aluminum, cadmium, copper, chromium, lead, nickel and zinc, which are to be conducted on samples of the effluent in conjunction with WET tests. The results of the lead and copper analyses conducted on samples of the effluent in conjunction with WET tests may be used to satisfy one of the monitoring requirements for lead and copper for the particular week/month in which the analyses were conducted.

The results of WET tests and associated analyses from 2005-2008 are shown in **Appendices B** and **F**.

VI. SLUDGE

Section 405(d) of the Clean Water Act (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 federal (40 CFR Part 503) and state (Env-Ws 800) standards. 40 CFR Part 503 regulations have a self-implementing provision; however, the CWA requires implementation through permits. Domestic sludge which is disposed of in municipal solid waste landfills are 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 CFR Part 258.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, the document entitled *EPA Region I NPDES Permit Sludge Compliance Guidance* (USEPA-Region I, November 1999) is included as an attachment to the draft permit for use by the permittee in determining the appropriate sludge conditions for the chosen method of sewage sludge use or disposal practices (see **Attachment B** of the draft permit). The permittee is required to submit an annual report to EPA-Region I and NHDES-WD by **February 19th** of each year, containing the information specified in the guidance document attached to the draft permit for the permittee's chosen method of sludge disposal.

VII. INDUSTRIAL USERS

The permittee is presently not required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR §403 and Section 307 of the CWA. However, the draft permit contains conditions that are necessary to allow EPA and the State of New Hampshire to ensure that pollutants from industrial users will not pass through the facility and cause violations of water quality standards in the receiving water, sludge use and disposal difficulties or cause interference with the operation of the treatment facility. The permittee is required to notify EPA and the State of New Hampshire whenever a process wastewater discharge to the facility from a primary industrial category is planned, (see 40 CFR §122 Appendix A for list) or if there is any substantial change in the volume or character of pollutants being discharged into the facility by a source that was discharging at the time of issuance of the permit. The permit also requires the permittee to: (1) report to EPA and NNHDES the name(s) of all Industrial Users subject to Categorical Pretreatment Standards under 40 CFR §403.6 and 40 CFR Chapter I, Subchapter N (Parts 405-415, 417-436, 439-440, 443, 446-447, 454-455, 457-461, 463-469, and 471 as amended) who commence discharge to the POTW after the effective date of the permit, and (2) submit to EPA and NHDES copies of Baseline Monitoring Reports and other pretreatment reports submitted by industrial users.

VIII. OPERATION AND MAINTENANCE

Regulations regarding proper operation and maintenance are found at 40 CFR § 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 of "facilities and systems of treatment and control" and are therefore subject to the proper operation and maintenance requirements of 40 CFR § 122.41(e).

Similarly, a permittee has a "duty to mitigate" pursuant to 40 CFR § 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 draft permit. Specific permit conditions have also been included in Parts I.B, C, and D. of the draft permit. These requirements include mapping of the wastewater collection system, reporting of unauthorized discharges (including sanitary sewer overflows (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 for maintaining alternate power where necessary.

IX. ESSENTIAL FISH HABITAT

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with the National Marine Fisheries Services (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, may adversely impact any essential fish habitat (16 U.S.C. § 802(10)).

The Amendments broadly define "essential fish habitat" (EFH) as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. § 1802(10)). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH (50 CFR § 600.910(a)). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences or actions.

Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b)(a)(A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

The Atlantic salmon (*Salmo salar)* is the only managed species with designated EFH in the Ammonoosuc River. The Ammonoosuc River is classified as a cold water fishery, and is considered by the New Hampshire Fish and Game Department to be some of the best nursery habitat for Atlantic salmon in the Connecticut River Watershed.

EPA has determined that the draft permit has been conditioned in such a way so as to

minimize any adverse impacts to EFH for the following reasons:

- This permit action is a reissuance of an existing NPDES permit.

- The facility withdraws no water from the Ammonoosuc River, so no life stages of Atlantic salmon are vulnerable to impingement or entrainment from this facility.

- The draft permit prohibits the discharge from violating state water quality standards.

- The draft permit prohibits the discharge of pollutants or combination of pollutants in toxic amounts.

- The draft permit requires quarterly toxicity testing to ensure that the discharge does not present toxicity problems.

- The effluent limitations and conditions in the draft permit were developed to be protective of all aquatic life.

- A numeric limit for lead is proposed, requiring sampling four times per month.

- A numeric limit for copper is proposed, requiring sampling twice per month.

EPA believes that the conditions and limitations contained within the draft permit adequately protects all aquatic life, including those with designated EFH in the receiving water, and that further mitigation is not warranted. Should adverse impacts to EFH be detected as a result of this permit action, or if new information is received that changes the basis for EPA's conclusions, NMFS will be contacted and an EFH consultation will be re-initiated.

As the federal agency charged with authorizing the discharge from this facility, EPA has submitted the draft permit and fact sheet, along with a cover letter, to NMFS Habitat Division for their review.

X. ENDANGERED SPECIES ACT

Section 7(a) of the Endangered Species Act (ESA) of 1973, as amended (the "Act"), grants authority to and imposes requirements upon federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and the habitats of such species that have been designated as critical ("critical habitat").

Section 7(a)(2) of the Act requires every federal agency in consultation with and with the assistance of the Secretary of the Interior, to ensure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish. The United States Fish and Wildlife

Service (USFWS) administers Section 7 consultations for freshwater species.

EPA has made a determination that no listed species and/or critical habitat are found in the vicinity of the project. This determination was based in part on correspondence received by EPA from the USFWS (dated July 14, 2005), which stated that that based on information currently available, "no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s)….." and that "further consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act is not required" (U.S. Fish and Wildlife Service letter, dated July 14, 2005).

In a letter to EPA dated July 10, 2007, the NMFS also stated that "no listed species are known to occur in the Ammonoosuc River..." and that "no further coordination with NMFS is necessary" (NMFS letter, July 2007).

If new information becomes available regarding the presence of a listed species in the vicinity of the project, EPA will contact the federal agency responsible under the Endangered Species Act.

XI. ANTIDEGRADATION

The New Hampshire water quality standards include an antidegradation provision which states that the existing designated uses and the level of water quality necessary to protect the existing uses shall be maintained and protected (Env-Ws 1708).

The draft permit contains limitations and conditions which are at least as stringent as those contained in the existing permit. The State of New Hampshire has indicated that there will be no lowering of water quality and no loss of existing designated uses in the receiving water as a result of this permit action, and that additional antidegradation review is not warranted at this time.

XII. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the state water pollution control agency with jurisdiction over the receiving water(s) in which the discharge originates 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 violate state water quality standards or the agency waives its right to certify as set forth in 40 CFR § 124.53. The NHDES is the certifying authority within the State of New Hampshire.

The staff of the NHDES-WD, Surface Water Quality Bureau, has reviewed the draft permit and advised EPA-Region I that the limitations are adequate to protect water quality. EPA-Region I has requested permit certification by the state and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 CFR §§124.53 and §124.55.

XIII. COMMENT PERIOD, REQUESTS FOR PUBLIC HEARINGS AND PROCEDURES FOR FINAL DECISION

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:

Meridith Timony
U.S. Environmental Protection Agency
One Congress Street
Suite 1100 (Mail Code CMP)
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1533
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 the EPA office listed above.

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 (8:00 a.m. and 4:00 p.m. for the state), excluding holidays.

_____

Date:

Ken Moraff, Acting Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

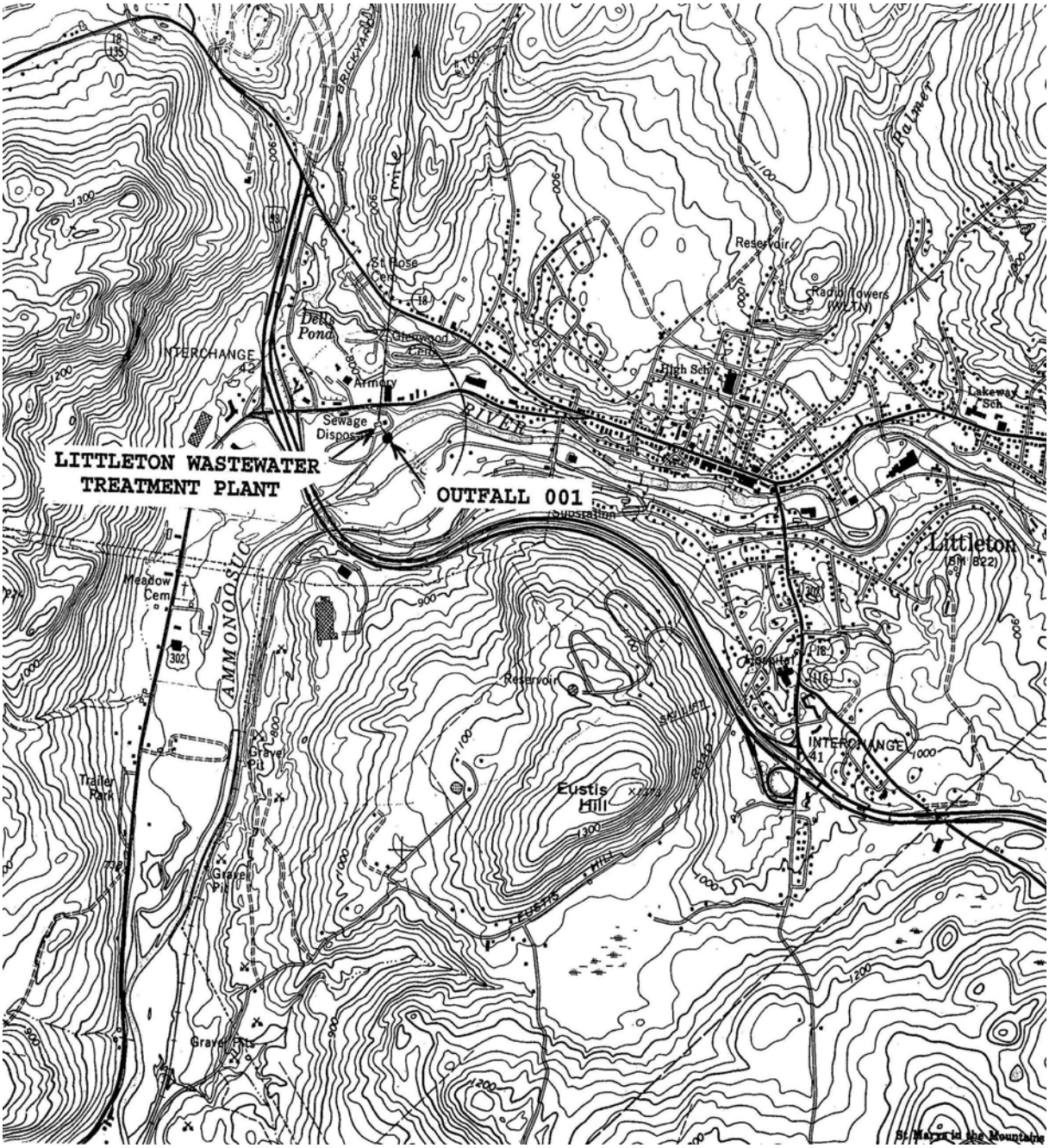

Figure 1 Geographic Location of the Littleton WWTP

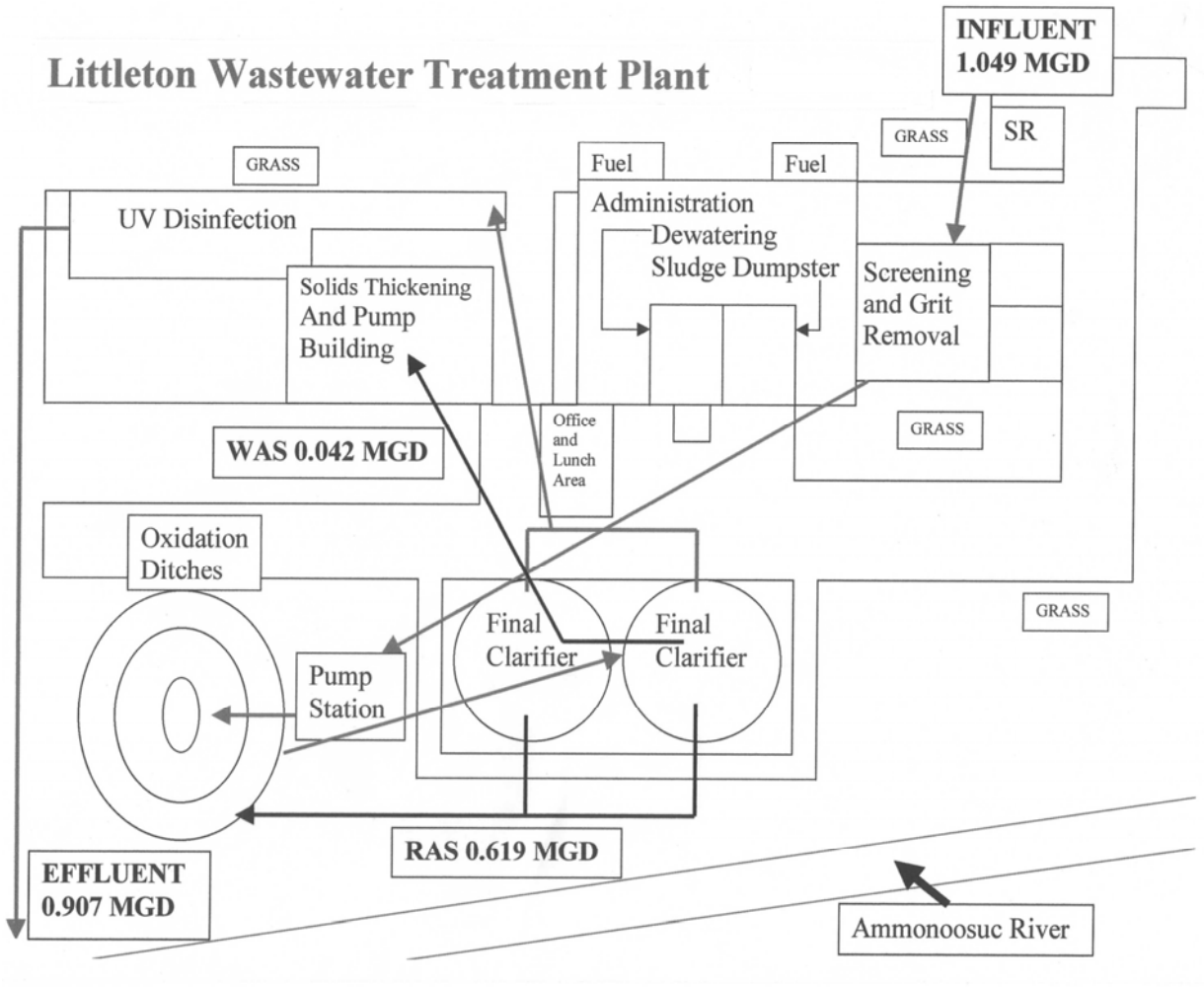

Figure 2 Littleton WWTP Process Flow Diagram

Appendix A
Conventional Pollutants (2005-2008)

Date	Flow		BOD_5 (mg/l)			BOD_5 (lbs/day)			TSS (mg/l)			TSS (lbs/day)			pH (SU)		*E. coli* (cfu/100 ml)	
	Avg.Monthly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Minimum	Maximum	Avg.Monthly	Max.Daily
Existing Limits	**Report**	**Report**	**30**	**45**	**50**	**375**	**563**	**626**	**30**	**45**	**50**	**375**	**563**	**626**	**6.5**	**8.0**	**126**	**406**
8/31/2005	0.704	1.667	3.7	7.3	7.8	22.34	43.6	45.8	1.6	2.3	3	11.4	13.7	36.2	6.6	7.2	6.48	25.00
9/30/2005	0.737	1.126	2.9	4.8	5.5	18.09	31.7	31.73	2.1	2.3	4.6	13.41	25.3	27.4	6.7	7.2	8.24	24.70
10/31/2005	1.357	3.258	3.1	4.4	5.8	31.14	60.3	85.52	3.1	4.7	5.3	31.45	61.5	64	6.6	7.1	10.32	60.00
11/30/2005	1.163	2.126	2.7	4.5	4.6	30.91	52.6	67.38	2.8	3.9	4	34.01	63.1	65.6	6.6	7.8	5.42	47.00
12/31/2005	0.882	1.459	2.8	3.7	4.6	21.01	27.6	31.64	1.8	2.3	3.3	13.41	27.8	28	6.7	7.2	5.57	46.00
1/31/2006	1.071	2.472	2.2	2.9	3.5	19.1	25.2	35.05	1.8	2.7	3.3	14.25	16.4	20.6	6.8	7.1	3.17	5.00
2/28/2006	0.872	1.666	2.9	4.3	5.6	20.21	27.35	36.2	2.2	2.5	2.7	15.79	18.4	19.5	6.8	7.3	3.15	6.00
3/31/2006	0.744	1.113	3	3.1	3.9	19.53	23.68	29.7	2.4	2.9	3.6	15.15	17.7	21.4	6.7	7.2	3.99	14.00
4/30/2006	0.847	1.04	3.8	4.7	5.1	28.59	31.53	36.58	2.4	3	3.3	17.69	21.9	22.4	6.8	7	5.25	12.00
5/31/2006	0.877	1.463	3	4.9	5.2	23.09	45.21	49.7	2.4	2.3	4.3	17.67	18.9	28.9	6.9	7.3	6.64	18.00
6/30/2006	1.252	2.406	3	3.3	4.2	34.43	45.56	62.52	2.1	3.8	5	27.46	44.6	74.4	6.7	7.3	10.80	210.00
7/31/2006	1.062	1.869	4.1	7	7.9	36.87	69.9	80.58	2.7	4.1	4.6	23.58	46.5	44.7	6.7	7.2	19.81	73.00
8/31/2006	0.832	1.336	1.8	2.1	2.5	12.87	20.97	21.89	1.8	2.3	3.6	12.9	23.2	29	6.7	7.1	34.10	171.00

Appendix A
Conventional Pollutants (2005-2008)

Date	Flow		BOD_5 (mg/l)			BOD_5 (lbs/day)			TSS (mg/l)			TSS (lbs/day)			pH (SU)		*E. coli* (cfu/100 ml)	
	Avg.Monthly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Minimum	Maximum	Avg.Monthly	Max.Daily
Existing Limits	**Report**	**Report**	**30**	**45**	**50**	**375**	**563**	**626**	**30**	**45**	**50**	**375**	**563**	**626**	**6.5**	**8.0**	**126**	**406**
9/30/2006	0.608	0.823	2.3	3.7	5.2	11.49	18.89	26.11	2.8	4.8	5.3	1383	18.3	24.7	6.8	7.2	135.10	61.00
10/31/2006	0.84	1.654	2.1	2.4	2.8	13.66	19.17	19.55	3.4	4.5	5	21.77	28.8	31.7	6.6	7.2	20.44	66.00
11/30/2006	0.898	1.164	3.7	4.5	5	27.92	32.26	38.83	3	3.5	4	22.4	28.3	34.3	6.6	7.1	41.95	117.00
12/31/2006	0.916	1.787	4	5.4	6.1	27.92	35.27	38.87	5.7	7.5	8	40.45	49.1	51	6.6	7	20.33	195.00
1/31/2007	0.835	1.371	2.9	2.3	3.8	19.78	29.73	34.5	4.5	5.1	6.6	30.74	40.6	51.6	6.7	7.1	53.48	105.00
2/28/2007	0.588	0.691	4.2	5.4	5.5	20.64	26.68	26.93	5.9	6.8	8	29.25	33	38.4	6.9	7.5	24.67	86.00
3/31/2007	0.952	1.652	3.1	4.5	5.2	23.06	36.7	51.43	4.9	6.8	8	36.93	56.2	79.1	6.8	7.4	30.78	68.00
4/30/2007	1.188	2.358	2.4	2.9	3.2	24.77	36.58	44.67	3.6	4.5	6	37.36	56.1	77	6.7	7.1	30.54	82.00
5/31/2007	0.904	1.441	3.7	3.7	4.6	27.73	30.51	36.67	3.2	4.4	5.6	24.63	35.5	53.2	6.6	7.7	32.50	118.00
6/30/2007	0.848	1.151	3.7	5	5.7	25.83	32.72	39.08	2.5	3.5	5	17.19	20.2	29.3	6.7	7.1	45.39	133.00
7/31/2007	0.813	1.097	3.8	7.2	7.8	25.32	41.28	42.87	3.1	6.3	8.6	20.22	35.7	47.3	6.7	7.3	12.22	80.00
8/31/2007	0.72	0.932	4.6	6.3	6.9	26.83	37.59	35.26	1.7	2	4	10.39	13.3	22.7	6.6	7.3	22.38	93.00
9/30/2007	0.72	1.044	4.4	6.15	6.2	26.34	38.05	43.06	3.1	4.95	5.3	17.94	26.6	28.3	6.6	7.3	13.49	99.00
10/31/2007	0.818	1.622	2.3	3.15	4.7	14.48	18.07	26.89	2.6	3.5	4.3	16.38	20.1	30.9	6.7	7.2	30.80	235.00
11/30/2007	0.95	1.641	0.4	4.6	4.7	25.89	28.22	32.89	1.4	3.5	2.3	10.58	25	17.2	6.6	7.3	15.36	15.00

Appendix A
Conventional Pollutants (2005-2008)

Date	Flow		BOD_5 (mg/l)			BOD_5 (lbs/day)			TSS (mg/l)			TSS (lbs/day)			pH (SU)		*E. coli* (cfu/100 ml)	
	Avg.Monthly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Avg.Monthly	Avg.Weekly	Max.Daily	Minimum	Maximum	Avg.Monthly	Max.Daily
Existing Limits	**Report**	**Report**	**30**	**45**	**50**	**375**	**563**	**626**	**30**	**45**	**50**	**375**	**563**	**626**	**6.5**	**8.0**	**126**	**406**
12/31/2007	0.777	1.138	5.3	6.1	7.6	33.5	43.04	51.66	2.8	5.1	6.6	18.29	36.2	44.9	6.9	7.3	6.05	76.00
1/31/2008	0.89	1.454	2.9	2.6	6	20.51	21.59	37.43	2.9	3.5	4.6	20.85	22.9	28.4	6.9	7.4	4.14	15.00
2/29/2008	0.815	1.387	3.6	5.1	6	24.57	33.51	32.73	3.3	3.45	4.6	22.76	27.7	30.8	6.9	7.4	3.92	48.00
3/31/2008	1.201	2.721	3	4.25	4.8	28.52	40.21	47.92	4	6.6	6.6	38.19	66.8	71.2	6.8	7.2	2.78	33.00
4/30/2008	1.413	2.476	2.4	3.05	3.9	31.78	44.47	59.88	2.9	3.95	6.3	40.66	56.5	90.1	6.7	7.2	5.30	6.50
5/31/2008	0.891	1.362	3.7	4.9	5.8	26.03	44.93	50.07	3.3	5	5.3	22.81	66.6	34.5	6.8	7.4	3.47	20.00
6/30/2008	0.838	0.999	2.8	3.1	3.6	21.03	24.48	28.55	1.7	2.45	2.6	12.22	17.9	18.5	6.8	7.3	7.14	28.00
7/31/2008	0.973	2.314	3.4	4.3	4.6	26.18	42.94	60.08	2.3	3.8	4	17.76	28.1	29.3	6.8	7.2	9.61	127.00
8/31/2008	1.112	2.381	3.2	5.6	5.6	31.27	48.43	55.6	3.8	4.5	5	38.56	62.9	85.4	6.6	7.7	63.96	161.00
Min.	0.59	0.69	0.40	2.10	2.50	11.49	18.07	19.55	1.40	2.00	2.30	10.39	13.30	17.20	6.6	7.0	2.8	5.0
Max.	1.41	3.26	5.30	7.30	7.90	36.87	69.90	85.52	5.90	7.50	8.60	1383.00	66.80	90.06	6.90	7.80	135.10	235.00
Average	0.92	1.61	3.16	4.41	5.18	24.41	35.42	42.59	2.91	4.03	4.92	59.45	34.36	41.40	6.72	7.27	20.51	75.11

Appendix B
Non-conventional Pollutants (2005-2008)

Date	Whole Effluent Toxicity	Whole Effluent Toxicity	Whole Effluent Toxicity	Whole Effluent Toxicity	Hardness (mg/l)	Ammonia Nitrogen (mg/l)
	LC_{50} (*C. dubia*)	LC_{50} (*P. promelas*)	C-NOEC (*C. dubia*)	C-NOEC (*P. promelas*)	Effluent	Avg. Monthly
Existing Limits	**≥ 100 %**	**≥ 12.2 %**	**≥ 12.2 %**	**≥ 12.2 %**	**Report**	**Report**
6/30/2005	100	100	100	100	95	5.8
9/30/2005	100	100	100	100	46	0.01
12/31/2005	100	100	100	100	69	0.01
3/31/2006	100	100	100	100	64	12
6/30/2006	100	100	100	6.25	61	11
9/30/2006	100	100	100	100	57	0.1
12/31/2006	100	100	100	100	46	0.14
3/31/2007	100	100	100	100	51	8.2
6/30/2007	100	100	100	100	75	7.3
9/30/2007	100	100	100	100	54	0.13
12/31/2007	100	100	100	100	53	0.1
3/31/2008	100	100	12.2	100	100	12
6/30/2008	100	100	25	100	62	15
Min.	100	100	12.2	6.25	46	0.01
Max.	100	100	100	100	100	15
Average	100	100	83.72	90.63	62.30	6.60

Appendix C
Toxic Pollutants (2005-2008)[1]

Date	Total Residual Chlorine (mg/l)[2]		Copper (mg/l)	Lead (mg/l)	Zinc (mg/l)	Aluminum (mg/l)	Nickel (mg/l)	Cadmium (mg/l)	Chromium (mg/l)
	Avg.Monthly	Max.Daily	Max.Daily	Max.Daily	Max.Daily	Max.Daily	Max.Daily	Max.Daily	Max.Daily
Existing Limits	**0.09**	**0.156**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**
6/30/2005			0.01	0.009	0.033	0.01	0.006	0.001	0.002
9/30/2005			0.024	0.065	0.11	0.18	0.022	0.005	0.008
12/31/2005			0.002	0.005	0.014	0.02	0.003	0.001	0.002
3/31/2006			0.012	0.01	0.079	0.03	0.008	0.002	0.002
6/30/2006			0.007	0.006	0.047	0.01	0.006	0.001	0.002
9/30/2006			0.005	0.0126	0.042	0.01	0.003	0.001	0.002
12/31/2006			0.022	0.011	0.066	0.01	0.006	0.001	0.002
3/31/2007			0.008	0.005	0.063	0.01	0.003	0.001	0.002
6/30/2007			0.004	0.005	0.042	0.026	0.003	0.001	0.002
9/30/2007			0.005	0.006	0.053	0.02	0.003	0.001	0.002
12/31/2007			0.005	0.005	0.034	0.02	0.003	0.001	0.002
3/31/2008			0.01	0.72	0.081	0.02	0.003	0.5	NA
6/30/2008			0.014	0.005	0.11	0.02	0.003	0.005	NA
Min.			0.002	0.005	0.014	0.01	0.003	0.001	0.002
Max.			0.024	0.72	0.11	0.18	0.022	0.5	0.008
Average			0.010	0.067	0.060	0.030	0.006	0.040	0.003

[1]Results are from analyses conducted on samples of the effluent in conjunction with whole effluent toxicity tests from 2005-2008.

[2] Chlorine not used
NA = No data available

Appendix D
NH, VT, and MA POTW Discharges of Nitrogen to the Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
NEW HAMPSHIRE					
Bethlehem Village District	NH0100501	0.340	0.220	19.600	35.962
Charlestown WWTF	NH0100765	1.100	0.360	19.600	58.847
Claremont WWTF	NH0101257	3.890	1.610	14.060	188.789
Colebrook WWTF	NH0100315	0.450	0.230	19.600	37.597
Groveton WWTF	NH0100226	0.370	0.290	19.600	47.405
Hanover WWTF	NH0100099	2.300	1.440	30.000	360.288
Hinsdale WWTF	NH0100382	0.300	0.300	19.600	49.039
Keene WWTF	NH0100790	6.000	3.910	12.700	414.139
Lancaster POTW	NH0100145	1.200	1.080	8.860	79.804
Lebanon WWTF	NH0100366	3.180	1.980	19.060	314.742
Lisbon WWTF	NH0100421	0.320	0.146	19.600	23.866
Littleton WWTF	NH0100153	1.500	0.880	10.060	73.832
Newport WWTF	NH0100200	1.300	0.700	19.600	114.425
Northumberland Village WPCF	NH0101206	0.060	0.060	19.600	9.808
Sunapee WPCF	NH0100544	0.640	0.380	15.500	49.123
Swanzey WWTP	NH0101150	0.167	0.090	19.600	14.712
Troy WWTF	NH0101052	0.265	0.060	19.600	9.808
Wasau Paper (industrial facility)	NH0001562		5.300	4.400	194.489
Whitefield WWTF	NH0100510	0.185	0.140	19.600	22.885
Winchester WWTP	NH0100404	0.280	0.240	19.600	39.231
Woodsville Fire District	NH0100978	0.330	0.230	16.060	30.806
New Hampshire Total		**24.177**	**19.646**		**2169.596**

VERMONT					
Bellows Falls	VT0100013	1.405	0.610	21.060	107.141
Bethel	VT0100048	0.125	0.120	19.600	19.616
Bradford	VT0100803	0.145	0.140	19.600	22.885
Brattleboro	VT0100064	3.005	1.640	20.060	274.373
Bridgewater	VT0100846	0.045	0.040	19.600	6.539
Canaan	VT0100625	0.185	0.180	19.600	29.424
Cavendish	VT0100862	0.155	0.150	19.600	24.520

Appendix D
NH, VT, and MA POTW Discharges of Nitrogen to the Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
VERMONT					
Chelsea	VT0100943	0.065	0.060	19.600	9.808
Chester	VT0100081	0.185	0.180	19.600	29.424
Danville	VT0100633	0.065	0.060	19.600	9.808
Lunenberg	VT0101061	0.085	0.080	19.600	13.077
Hartford	VT0100978	0.305	0.300	19.600	49.039
Ludlow	VT0100145	0.705	0.360	15.500	46.537
Lyndon	VT0100595	0.755	0.750	19.600	122.598
Putney	VT0100277	0.085	0.080	19.600	13.077
Randolph	VT0100285	0.405	0.400	19.600	65.386
Readsboro	VT0100731	0.755	0.750	19.600	122.598
Royalton	VT0100854	0.075	0.070	19.600	11.442
St. Johnsbury	VT0100579	1.600	1.140	12.060	114.662
Saxtons River	VT0100609	0.105	0.100	19.600	16.346
Sherburne Fire Dist.	VT0101141	0.305	0.300	19.600	49.039
Woodstock WWTP	VT0100749	0.055	0.050	19.600	8.173
Springfield	VT0100374	2.200	1.250	12.060	125.726
Hartford	VT0101010	1.225	0.970	30.060	243.179
Whitingham	VT0101109	0.015	0.010	19.600	1.635
Whitingham Jacksonville	VT0101044	0.055	0.050	19.600	8.173
Cold Brook Fire Dist.	VT0101214	0.055	0.050	19.600	8.173
Wilmington	VT0100706	0.145	0.140	19.600	22.885
Windsor	VT0100919	1.135	0.450	19.600	73.559
Windsor-Weston	VT0100447	0.025	0.020	19.600	3.269
Woodstock WTP	VT0100757	0.455	0.450	19.600	73.559
Woodstock-Taftsville	VT0100765	0.015	0.010	19.600	1.635
Vermont Totals		**15.940**	**10.960**		**1727.302**

MASSACHUSETTS					
Amherst	MA0100218	7.100	4.280	14.100	503.302
Athol	MA0100005	1.750	1.390	17.200	199.393
Barre	MA0103152	0.300	0.290	26.400	63.851

Appendix D
NH, VT, and MA POTW Discharges of Nitrogen to the Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
MASSACHUSETTS					
Belchertown	MA0102148	1.000	0.410	12.700	43.426
Charlemont	MA0103101	0.050	0.030	19.600	4.904
Chicopee	MA0101508	15.500	10.000	19.400	1617.960
Easthampton	MA0101478	3.800	3.020	19.600	493.661
Erving #1	MA0101516	1.020	0.320	29.300	78.196
Erving #2	MA0101052	2.700	1.800	3.200	48.038
Erving #3	MA0102776	0.010	0.010	19.600	1.635
Gardner	MA0100994	5.000	3.700	14.600	450.527
Greenfield	MA0101214	3.200	3.770	13.600	427.608
Hadley	MA0100099	0.540	0.320	25.900	69.122
Hardwick G	MA0100102	0.230	0.140	14.600	17.047
Hardwick W	MA0102431	0.040	0.010	12.300	1.026
Hatfield	MA0101290	0.500	0.220	15.600	28.623
Holyoke	MA0101630	17.500	9.700	8.600	695.723
Huntington	MA0101265	0.200	0.120	19.600	19.616
Monroe	MA0100188	0.020	0.010	19.600	1.635
Montague	MA0100137	1.830	1.600	12.900	172.138
N Brookfield	MA0101061	0.760	0.620	23.100	119.445
Northampton	MA0101818	8.600	4.400	22.100	810.982
Northfield	MA0100200	0.280	0.240	16.800	33.627
Northfield School	MA0032573	0.450	0.100	19.600	16.346
Old Deerfield	MA0101940	0.250	0.180	9.200	13.811
Orange	MA0101257	1.100	1.200	8.600	86.069
Palmer	MA0101168	5.600	2.400	18.800	376.301
Royalston	MA0100161	0.040	0.070	19.600	11.442
Russell	MA0100960	0.240	0.160	19.600	26.154
Shelburne Falls	MA0101044	0.250	0.220	16.900	31.008
South Deerfield	MA0101648	0.850	0.700	7.900	46.120
South Hadley	MA0100455	4.200	3.300	28.800	792.634
Spencer	MA0100919	1.080	0.560	13.600	63.517
Springfield	MA0103331	67.000	45.400	4.300	1628.135

Appendix D
NH, VT, and MA POTW Discharges of Nitrogen to the Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
MASSACHUSETTS					
Sunderland	MA0101079	0.500	0.190	8.700	13.786
Templeton	MA0100340	2.800	0.400	26.400	88.070
Ware	MA0100889	1.000	0.740	9.400	58.013
Warren	MA0101567	1.500	0.530	14.100	62.325
Westfield	MA0101800	6.100	3.780	20.400	643.114
Winchendon	MA0100862	1.100	0.610	15.500	78.855
Woronoco Village	MA0103233	0.020	0.010	19.600	1.635
Massachusetts Totals		**166.010**	**106.950**		**9938.820**

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 13,836 lbs/day
MA (41 facilities) = 9,939 lbs/day (72%)
VT (32 facilities) = 1,727 lbs/day (12%)
NH (21 facilities) = 2170 lbs/day (16%)
TMDL Baseline Load = 21,672 lbs/day

TMDL Allocation = 16,254 lbs/day (25% reduction)

Appendix E
Mass Limitations for BOD_5 and TSS

Mass limitations for BOD_5 and TSS are based on the following equation:

$L = C * Q_{PDF} * 8.345$

Where:
L = Maximum allowable load (lbs/day)
C = Maximum allowable effluent concentration (mg/l)
Q_{PDF} = Wastewater treatment plant design flow
8.345 = Factor to convert effluent concentration, in mg/l, and plant's design flow, in MGD, to lbs/day

Average Monthly Mass Limit

L = 30 mg/l * 1.5 MGD * 8.34 = 375 lbs/day

Average Weekly Mass Limit

L = 45 mg/l * 1.5 MGD * 8.34 = 563 lbs/day

Maximum Daily Mass Limit

L = 50 mg/l * 1.5 MGD * 8.34 = 626 lbs/day

Appendix F

Water Quality Criteria and Effluent Limits (Maximum Allowable Effluent Concentrations) for Metals

Metal	Dissolved Criteria (µg/l)[1]		Dilution Factor	Conversion Factor[2]		Total Recoverable Limit (µg/l)	
	Acute	Chronic		Acute	Chronic	Acute[4]	Chronic[5]
Lead[3]	0.14	0.54	6.14	0.993	0.993	87	3.3
Copper	3.6	2.7	6.14	0.960	0.960	23.0	17.3
Zinc	36.2	36.5	6.14	0.978	0.986	227	227
Nickel	144.9	16.1	6.14	0.998	0.997	871	99.2
Aluminum	750	87	6.14	NA	NA	4605	534.18
Chromium[3]	183	24	6.14	0.316	0.860	3556	171
Cadmium[3]	0.95	0.80	6.14	1.002	1.002	5.8	4.9

[1] The values for acute and chronic freshwater dissolved metals criteria are found in the New Hampshire Water Quality Standards at Env-Ws 1703.21, Table 1700.1. These values are based on a total hardness value of 25 mg/l or less, in accordance with footnote f of Table 1700.1.

[2] Conversion factors are used to convert between dissolved and total recoverable metals. In accordance with 40 CFR § 122.45(c), permit limits are to be expressed in terms of total recoverable metals. Conversion factors are found at Env-Ws 1703.21, Table 1703.2 (also see *EPA Metal Translator Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criteria*, EPA 1996 [EPA-823-B96-007]).

[3] Lead Acute and Chronic Conversion Factor = 1.46203 - [(Ln(hardness)) (0.145712)] = 0.993
Cadmium Acute Conversion Factor = 1.136672 - [(Ln(hardness))(0.041838)] = 1.002
Cadmium chronic Conversion Factor = 1.101672 - [(Ln(hardness))(0.041838)] = 1.002

[4] Acute Limit (Maximum Daily Limit) = (Acute criterion)(Dilution Factor)/Conversion Factor

[5] Chronic Limit (Average Monthly Limit) = (Chronic criterion)(Dilution Factor)/Conversion Factor