AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act, as amended, (33 U.S.C. §1251 et seq.; the "CWA"),

The City of Concord, New Hampshire

is authorized to discharge from the Wastewater Treatment Plant located at

125 Hall Street
Concord, New Hampshire 03301

to receiving waters named

Merrimack River

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein including, but not limited to, conditions requiring the proper operation and maintenance of the Concord Hall Street Wastewater Treatment Plant collection system.

This permit will become effective on the first day of the calendar month immediately following sixty days after signature.

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on January 14, 2005.

This permit consists of **Part I (**15 pages including effluent limitations and monitoring requirements); **Attachment A** (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages); **Attachment B** (Reassessment of Technically Based Industrial Discharge Limits, 9 pages); **Attachment C** (NPDES Permit Requirement for Industrial Pretreatment Annual Report, 2 pages); and **Part II (**25 pages including General Conditions and Definitions).

Signed this 2nd day of September, 2011

/S/SIGNATURE ON FILE

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Stephen S. Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency (EPA)
Region I
Boston, Massachusetts

PART I
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge from outfall serial number 001 to the Merrimack River, treated domestic and industrial wastewater effluent. Such discharges shall be limited and monitored by the permittee as specified below. Samples taken in compliance with the monitoring requirements specified below shall be taken at a location that provides a representative analysis of the effluent.

Effluent Characteristic	Discharge Limitations			Monitoring Requirements	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Flow; MGD	Report	---	Report	Continuous Recorder[1]	
BOD_5; mg/l (lbs/day)	30 (2529)	45 (3793)	50 (4214)	2/Week[2]	24 Hour Composite
TSS; mg/l (lbs/day)	30 (2529)	45 (3793)	50 (4214)	2/Week[2]	24 Hour Composite
Total Phosphorus; lb/d (mg/l)	199 (Report)	---	Report	1/Week	24 Hour Composite
(Applicable April 1 through October 31)					
pH Range[3]; Standard Units	6.5 to 8.0 (See I.I.5.)			1/Day	Grab
Total Residual Chlorine[4,6]; mg/l	0.36	---	0.62	1/Day	Grab
Escherichia coli[4,5]; Colonies/100 ml	126	---	406	3/Week	Grab
Total Recoverable Aluminum; ug/l	---	---	Report	2/Month	24 Hour Composite
Whole Effluent Toxicity					
LC50 [7,8,9]; Percent	---	---	100	1/Quarter	24 Hour Composite
Hardness[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Ammonia Nitrogen as N[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Aluminum[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Cadmium[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Copper[10] mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Nickel[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Lead[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Zinc[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite

See pages 3 and 4 for footnotes

FOOTNOTES TO PART I.A.1 on page 2.

(1) The effluent flow shall be continuously measured and recorded using a flow meter and totalizer.

(2) To monitor the 85 percent removal of BOD_5 and TSS required in Part I.A.4, the influent concentrations of both BOD_5 and TSS shall be monitored twice per month using a 24-Hour Composite sample and the results reported as average monthly values.

(3) State certification requirement.

(4) Monitoring for *Escherichia coli* bacteria as described in footnote (5) below shall be conducted concurrently with the daily monitoring for total residual chlorine (TRC) as described in footnote (6) below.

(5) The average monthly value for *Escherichia coli* shall be determined by calculating the geometric mean. *Escherichia coli* shall be tested using an approved method as specified in 40 Code of Federal Regulations (CFR) Part 136, List of Approved Biological Methods for Wastewater and Sewage Sludge.

(6) Total residual chlorine shall be measured using any one of the following three methods listed in 40 CFR Part 136:

a. Amperometric direct.
b. DPD-FAS.
c. Spectrophotometric, DPD.

(7) LC50 (lethal concentration 50 percent) is the concentration of wastewater (effluent) causing mortality to 50 percent (%) of the test organisms. Therefore, a 100 % limit means that a sample of 100 % effluent (no dilution) shall cause no greater than a 50 % mortality rate in that effluent sample.

(8) The permittee shall conduct 48-hour static acute toxicity tests on effluent samples following the February 2011 USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol (**Attachment A**). The two species for these tests are the Daphnids (*Ceriodaphnia dubia*) and the Fathead Minnow (*Pimephales promelas*). Toxicity test samples shall be collected and tests completed four times per year during the calendar quarters ending March 31st, June 30th, September 30th, and December 31st. Toxicity test results are to be postmarked by the 15th day of the month following the end of the quarter sampled.

(9) This permit shall be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements, including chemical specific limits such as for metals, if the results of the toxicity tests indicate the discharge causes an exceedance of any State water quality criterion. Results from these toxicity tests are considered "New Information" and the permit may be modified as provided in 40 CFR Section 122.62(a)(2).

(10) For each whole effluent toxicity test the permittee shall report on the appropriate discharge

monitoring report, (DMR), the concentrations of the hardness, ammonia nitrogen as nitrogen, total recoverable aluminum, cadmium, copper, lead, nickel, and zinc found in the 100 percent effluent sample. All these aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in **Attachment A** on page 7 of 8, or as amended. Also the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

2. The discharge shall not cause a violation of the water quality standards of the receiving water.

3. The discharge shall be adequately treated to insure that the surface water remains free from pollutants in concentrations or combinations that settle to form harmful deposits, float as foam, debris, scum or other visible pollutants. It shall be adequately treated to insure that the surface waters remain free from pollutants which produce odor, color, taste or turbidity in the receiving waters which is not naturally occurring and would render it unsuitable for its designated uses.

4. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both BOD_5 and TSS. The percent removal shall be based on a comparison of average monthly influent versus effluent concentrations.

5. When the effluent discharged for a period of 3 consecutive months exceeds 80 percent of the 10.1 MGD design flow (8.1 MGD), the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans. Before the design flow will be reached, or whenever treatment necessary to achieve permit limits cannot be assured, the permittee may be required to submit plans for facility improvements.

6. All POTWs must provide adequate notice to both EPA-New England and the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) of the following:

   a. Any new introduction of pollutants into the POTW from an indirect discharger in a primary industry category (see 40 CFR §122 Appendix A as amended) discharging process water; and

   b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

   c. For purposes of this paragraph, adequate notice shall include information on:

      (1) the quantity and quality of effluent introduced into the facility; and

(2) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the facility.

7. The permittee shall not discharge into the receiving water any pollutant or combination of pollutants in toxic amounts.

B. UNAUTHORIZED DISCHARGES

The permit only authorizes discharges in accordance with the terms and conditions of this permit and only from the Outfall listed in Part I.A.1 of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit and shall be reported in accordance with Part II, Section D.1.e. of the General Requirements of this permit (twenty four hour reporting).

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions. The permittee is required to complete the following activities for the collection system which it owns:

1. Maintenance Staff

   The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. This requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

2. Preventative Maintenance Program

   The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. This requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

3. Infiltration/Inflow

   The permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs to control I/I shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

4. Collection System Mapping

Within 30 months of the effective date of this permit, the permittee shall prepare a map of the sewer collection system it owns (see page 1 of this permit for the effective date). The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up to date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

a. All sanitary sewer lines and related manholes;
b. All combined sewer lines, related manholes, and catch basins;
c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combined manholes);
d. All outfalls, including the treatment plant outfall(s), CSOs, combined manholes, and any known or suspected SSOs;
e. All pump stations and force mains;
f. The wastewater treatment facility(ies);
g. All surface waters (labeled);
h. Other major appurtenances such as inverted siphons and air release valves;
i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;
j. The scale and a north arrow; and
k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System Operation and Maintenance Plan

The permittee shall develop and implement a Collection System Operation and Maintenance Plan.

a. **Within six (6) months of the effective date of the permit**, the permittee shall submit to EPA and NHDES

    1. A description of the collection system management goals, staffing, information management, and legal authorities;
    2. A description of the overall condition of the collection system including a list of recent studies and construction activities; and
    3. A schedule for the development and implementation of the full Collection System O & M Plan including the elements in paragraphs b.1. through b.7. below.

b. The full Collection System O & M Plan shall be submitted to EPA and NHDES and implemented **within twenty four (24) months from the effective date of this permit**. The Plan shall include:

    1. The required submittal from paragraph 5.a. above, updated to reflect current information;

2. A preventative maintenance and monitoring program for the collection system;
3. Sufficient staffing to properly operate and maintain the sanitary sewer collection system;
4. Sufficient funding and the source(s) of funding for implementing the plan;
5. Identification of known and suspected overflows and back-ups, including combined manholes, a description of the cause of the identified overflows and back-ups, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
6. A description of the permittee's program for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts; and
7. An educational public outreach program for all aspects of I/I control, particularly private inflow.

6. Annual Reporting Requirement

The permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. The report shall be submitted to EPA and NHDES **annually by March 31**. The first annual report is due the first March 31st following submittal of the collection system O&M Plan required by Part I.C.5.b of this permit. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;
b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;
c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
d. A map with areas identified for investigation/action in the coming year;
e. If treatment plant flow has reached 80% of the 10.1 mgd design flow (8.1 mgd) or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and
f. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit.

D. ALTERNATE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the permittee shall provide an alternate power source with which to sufficiently operate the wastewater facility, as

defined at 40 C.F.R. § 122.2, which references the definition at 40 C.F.R. § 403.3(o). Wastewater facility is defined by RSA 485A:2.XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and industrial wastes, and dispose of the effluent and sludge.

E. INDUSTRIAL PRETREATMENT PROGRAM CONDITIONS

1. Limitations for Industrial Users:

   a. A user may not introduce into a POTW any pollutant(s) which cause pass through or interference with the operation or performance of the treatment works. The terms "user", "pass through", and "interference" are defined in 40 C.F.R. § 403.3.

   b. The permittee shall develop and enforce specific effluent limits (local limits) for Industrial Users(s) and all other users as necessary, which together with appropriate changes in the POTW Treatment Plant's facilities or operation, are essential to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within 90 days of the effective date of this permit, the permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits. As part of this evaluation, the permittee shall assess how the POTW performs with respect to influent and effluent pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety, and collection system concerns. In preparing this evaluation, the permittee shall complete and submit the attached form (Attachment B – Reassessment of Technically Based Industrial Discharge Limits) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. The Permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).

2. Industrial Pretreatment Program

   a. The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the permittee's approved Pretreatment Program and the General Pretreatment Regulations, 40 C.F.R. §403. At a minimum, the permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):

      1. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency

established in the approved IPP, but in no case less than once per year, and maintain adequate records.

2. Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.

3. Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.

4. Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

b. The permittee shall provide the EPA and the NHDES-WD with an annual report describing the permittee's pretreatment program activities for the twelve month period ending 60 days prior to the due date in accordance with 40 C.F.R. §403.12(i). The annual report shall be consistent with the format described in Attachment C (NPDES Permit Requirement for Industrial Pretreatment Annual Report) and shall be submitted no later than June 1st of each year.

c. The permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 C.F.R. §403.18(c).

d. The permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 C.F.R. §405 et. seq.

e. The permittee must modify its pretreatment program to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the Industrial Pretreatment Program. The permittee must provide EPA, in writing, within 180 days of the effective date of this permit, proposed changes to the permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. At a minimum, the permittee must address in its written submission the following areas: (1) enforcement response plan; (2) revised sewer use ordinances; (3) slug control evaluations. The permittee will implement these proposed changes pending EPA's approval under 40 C.F.R. §403.18.

F. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal & state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.

2. The permittee shall comply with the more stringent of either the state (Env-Ws 800) or federal (40 CFR Part 503) requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to facilities which perform one or more of the following use or disposal practices.

   a. Land application - the use of sewage sludge to condition or fertilize the soil.
   b. Surface disposal - the placement of sewage sludge in a sludge only landfill.
   c. Sewage sludge incineration in a sludge only incinerator.

4. The 40 CFR Part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions do not apply to facilities which do not dispose of sewage sludge during the life of the permit, but rather treat the sludge (lagoons, reed beds), or are otherwise excluded under 40 CFR Section 503.6.

5. The permittee shall use and comply with the NPDES Permit Sludge Compliance Guidance, November 1999, to determine appropriate conditions. This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf . Appropriate conditions contain the following elements.

   General requirements
   Pollutant limitations
   Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
   Management practices
   Record keeping
   Monitoring
   Reporting

   Depending upon the quality of material produced by a facility all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction for the permittee's chosen sewage sludge use or disposal practices at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year.

less than 290	1/Year
290 to less than 1,500	1/Quarter
1,500 to less than 15,000	6/Year
15,000 plus	1/Month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR Section 503.8.

8. The permittee shall submit an annual report containing the information specified in the attached Sludge Compliance Guidance document. Reports are **due annually by February 19th**. Reports shall be submitted to both addresses (EPA-New England and

NHDES-WD) contained in the reporting section of the permit.

G. SPECIAL CONDITIONS

WET Test Frequency Adjustment

The permittee may submit a written request to the EPA-New England requesting a reduction in the frequency (to not less than once per year) of required toxicity testing, after completion of a minimum of the most recent four (4) successive toxicity tests of effluent, all of which must be valid tests and demonstrate compliance with the permit limits for whole effluent toxicity. Until written notice is received by certified mail from the EPA-New England indicating that the WET testing requirement has been changed, the permittee is required to continue testing at the frequency specified in the respective permit.

pH Limit Adjustment

The permittee may submit a written request to the EPA-New England requesting a change in the permitted pH limit range to be not less restrictive than 6.0 to 9.0 Standard Units found in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 CFR Part 133) for this facility. The permittee's written request must include the State's approval letter containing an original signature (no copies). The State's letter shall state that the permittee has demonstrated to the State's satisfaction that as long as discharges to the receiving water from a specific outfall are within a specific numeric pH range the naturally occurring receiving water pH will be unaltered. That letter must specify for each outfall the associated numeric pH limit range. Until written notice is received by certified mail from the EPA-New England indicating the pH limit range has been changed, the permittee is required to meet the permitted pH limit range in the respective permit.

H. MONITORING AND REPORTING

1. **For a period of one year from the effective date of the permit,** the permittee may either submit monitoring data and other reports to EPA in hard copy form or report electronically using NetDMR, a web-based tool that allows permittees to electronically submit Discharge Monitoring Reports (DMRs) and other required reports via a secure internet connection. **Beginning no later than one year after the effective date of the permit,** the permittee shall begin reporting using NetDMR, unless the facility is able to demonstrate a reasonable basis that precludes the use of NetDMR for submitting DMRs and reports. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

a. Submittal of Reports Using NetDMR

NetDMR is accessed from: http://www.epa.gov/netdmr. **Within one year of the effective date of this permit**, the permittee shall begin submitting DMRs and reports required under this permit electronically to EPA using NetDMR, unless the facility is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt-out request").

DMRs shall be submitted electronically to EPA no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA, including the NHDES Monthly Operating Reports (MORs), as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA or to NHDES.

b. Submittal of NetDMR Opt-Out Requests

Opt-out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under this permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA unless the permittee submits a renewed opt-out request and such request is approved by EPA. All opt-out requests should be sent to the following addresses:

Attn: NetDMR Coordinator
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

And

Attn: Compliance Supervisor
New Hampshire Department of Environmental Services (NHDES)
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

c. Submittal of Reports in Hard Copy Form

Monitoring results shall be summarized for each calendar month and reported on separate hard copy DMRs postmarked no later than the 15th day of the month following the completed reporting period. All reports required under the permit, including NHDES MORs, shall be submitted as an attachment to the DMRs. Signed and dated original DMRs and all other reports (with the exception of pretreatment reports) or notifications required herein or in Part II shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Water Technical Unit (OES04-SMR)
5 Post Office Square - Suite 100
Boston, MA 02109-3912

All pretreatment reports shall be submitted to:

US Environmental Protection Agency
Attn: Justin Pimpare
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100
OEP06-03
Boston, MA 02109-3912

Duplicate signed copies of all reports or notifications required above shall be submitted to the State at the following address:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

Any verbal reports, if required in **Parts I** and/or **II** of this permit, shall be made to both EPA-New England and to NHDES-WD.

I. STATE PERMIT CONDITIONS

1. The permittee shall not at any time, either alone or in conjunction with any person or persons, cause directly or indirectly the discharge of waste into the said receiving water unless it has been treated in such a manner as will not lower the legislated water quality classification or interfere with the uses assigned to said water by the New Hampshire Legislature (RSA 485-A:12).

2. This NPDES discharge permit is issued by EPA under federal and state law. Upon final issuance by EPA, the New Hampshire Department of Environmental Services-Water Division (NHDES-WD) may adopt this permit, including all terms and conditions, as a state permit pursuant to RSA 485-A:13.

3. EPA shall have the right to enforce the terms and conditions of this permit pursuant to federal law and NHDES-WD shall have the right to enforce the permit pursuant to state law, if the permit is adopted. Any modification, suspension, or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of the permit as issued by the other agency.

4. Pursuant to New Hampshire Statute RSA 485-A13,I(c), any person responsible for a bypass or upset at a *wastewater facility* shall give immediate notice of a bypass or upset to all public or privately owned water systems drawing water from the same receiving water and located within 20 miles downstream of the point of discharge regardless of whether or not it is on the same receiving water or on another surface water to which the receiving water is tributary. Wastewater facility is defined at RSA 485-A:2XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and

industrial wastes, and dispose of the effluent and sludge. The permittee shall maintain a list of persons, and their telephone numbers, who are to be notified immediately by telephone. In addition, written notification, which shall be postmarked within 3 days of the bypass or upset, shall be sent to such persons.

5. The pH range of 6.5 to 8.0 Standard Units (S.U.) must be achieved in the final effluent unless the permittee can demonstrate to NHDES-WD: (1) that the range should be widened due to naturally occurring conditions in the receiving water or (2) that the naturally occurring receiving water pH is not significantly altered by the permittee's discharge. The scope of any demonstration project must receive prior approval from NHDES-WD. In no case, shall the above procedure result in pH limits outside the range of 6.0 – 9.0 S.U., which is the federal effluent limitation guideline regulation for pH for secondary treatment and is found in 40 CFR 133.102(c).

6. Pursuant to New Hampshire Code of Administrative Rules, Env-Wq 703.07(a):

   (a) Any person proposing to construct or modify any of the following shall submit an application for a sewer connection permit to the department:

   (1) Any extension of a collector or interceptor, whether public or private, regardless of flow;

   (2) Any wastewater connection or other discharge in excess of 5,000 gpd;

   (3) Any wastewater connection or other discharge to a WWTP operating in excess of 80 percent design flow capacity based on actual average flow for 3 consecutive months;

   (4) Any industrial wastewater connection or change in existing discharge of industrial wastewater, regardless of quality or quantity; and

   (5) Any sewage pumping station greater than 50 gpm or serving more than one building.

7. For each new or increased discharge of industrial waste to the POTW, the permittee shall submit, in accordance with Env-Ws 904.14(e) an "Industrial Wastewater Discharge Request Application" approved by the permittee in accordance with 904.13(a). The "Industrial Wastewater Discharge Request Application" shall be prepared in accordance with Env-Ws 904.10.

8. Pursuant to Env-Ws 904.17, at a frequency no less than every five years, the permittee shall submit to NHDES:

   (a) A copy of its current sewer use ordinance. The sewer use ordinance shall include local limits pursuant to Env-Ws 904.04 (a).

(b) A current list of all significant indirect dischargers to the POTW. At a minimum, the list shall include for each significant indirect discharger, its name and address, the name and daytime telephone number of a contact person, products manufactured, industrial processes used, existing pretreatment processes, and discharge permit status.

(c) A list of all permitted indirect dischargers; and

(d) A certification that the municipality is strictly enforcing its sewer use ordinance and all discharge permits it has issued.

9. In addition to submitting DMRs, monitoring results shall also be summarized for each calendar month and reported on separate Monthly Operations Report Form(s) (MORs) postmarked or submitted electronically using NetDMR no later than the 15th day of the month following the completed reporting period. Signed and dated MORs, which are not submitted electronically using NetDMR shall be submitted to:

New Hampshire Department of Environmental Services (NHDES)
Water Division
Wastewater Engineering Bureau
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03302-0095

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
FIVE POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

FACT SHEET

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

CONTENTS: 34 pages including Attachments A through C.

NPDES PERMIT NO.: NH0100901

NAME AND MAILING ADDRESS OF APPLICANT:

City of Concord, New Hampshire
City Manager
41 Green Street
Concord, New Hampshire 03301

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Hall Street Wastewater Treatment Facility
Wastewater Treatment Plant Supt.
125 Hall Street
Concord, New Hampshire 03301

RECEIVING WATER: Merrimack River (Hydrologic Basin Code: 01070002)

CLASSIFICATION: B

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I. Proposed Action, Type of Facility and Discharge Location

The Hall Street Wastewater Treatment Facility is a publicly owned treatment works (POTW) owned and operated by the City of Concord, NH. The City applied to the U.S. Environmental Protection Agency (EPA) for reissuance of its NPDES permit to discharge treated effluent into the Merrimack River.

The facility collects and treats: (1) domestic wastewater from the City of Concord and from parts of the Town of Bow; (2) domestic septage from up to 45 communities in New Hampshire; and (3) industrial wastewater from 2 significant industrial users.

The Hall Street POTW treatment plant provides primary and secondary treatment and has a design flow of 10.1 million gallons per day (mgd). Raw wastewater entering the plant is first screened and degritted. The wastewater then enters primary clarifiers for removal of solids. Effluent from the primary clarifiers flows into an intermediate wetwell and is pumped into biological treatment units (bio-towers and aeration) that remove dissolved and suspended organic material. Secondary clarifiers then remove solids produced during biological treatment, and the effluent is then disinfected with sodium hypochlorite. Residual chlorine is removed, only when needed to remain within permitted limits, by the addition of sodium bisulfite prior to effluent discharge to the Merrimack River. Sludge produced during treatment of the wastewater is dewatered and stabilized prior to beneficial reuse as fertilizer supplement or in topsoil production.

Concord's existing permit (the "2005 permit") was issued on January 14, 2005, became effective on April 1, 2005, and expired on March 31, 2010. Because the applicant filed a complete application for permit reissuance within the time period prescribed in 40 Code of Federal Regulations (CFR) Section 122.6, the 2005 permit has been administratively extended until a new permit is issued. The 2005 permit authorizes discharge from Outfall 001 (Treatment Plant). The location of the treatment facility, Outfall 001 and the receiving water are shown in Attachment A. No changes to treatment or outfall have been made since the 2005 permit was issued.

II. Description of Discharge

A quantitative description of significant effluent parameters based on discharge monitoring data from May 2005 to August 2010 is shown in Attachment B.

III. Limitations and Conditions

The draft permit contains limitations for five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), total phosphorus, pH, *Escherichia coli* (*E. coli*) bacteria, total residual chlorine (TRC), total recoverable aluminum, and whole effluent toxicity (WET). It also contains monitoring requirements for flow, ammonia nitrogen as N, hardness, and other metals. The effluent limitations and monitoring requirements are found in PART I of the draft NPDES permit. The basis

for each limit and condition is discussed below in Section VI of this Fact Sheet.

IV. Statutory and Regulatory Authority

A. General Statutory and Regulatory Background

Congress enacted the Clean Water Act (CWA or Act), "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 the waters of the United States from any point source, except as authorized by specified permitting sections of the Act, one of which is Section 402. See CWA §§ 301(a), 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 Act, 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 CFR 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 based 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 BOD_5, TSS and pH. 40 C.F.R. Part 133.

Water quality-based effluent limits, on the other hand, 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 122.44(d)(5) (in part providing 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 the 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. Where a State has not established a numeric water quality criterion for a specific chemical 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 Section 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, in certain circumstances, based on an "indicator parameter." 40 CFR § 122.44(d)(1)(vi)(A-C).

All statutory deadlines for meeting secondary treatment-based effluent limitations established pursuant to the CWA have expired. Therefore, 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 CFR § 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 CFR Parts 122, 124, 125 and 136.

B. Development of Water Quality-based Limits

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 CFR §122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion.

1. 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 application, monthly discharge monitoring reports (DMRs), 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 water quality standards (RSA 485-A:8,VI, Env-Wq 1705.02, Env-Wq 1702.44) 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 on an annual basis with a recurrence interval of once in ten (10) years on average (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. Available dilution for tidal waters is based on conditions that result in dilution that is exceeded 99 percent of the time. Furthermore, for all waters, 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-Wq 1705.01.

C. Anti-Backsliding

Section 402(o) of the CWA and regulations found at 40 C.F.R. § 122.44(l) generally require that the effluent limitations of a renewed, reissued, or modified permit be at least as stringent as the comparable effluent limitations in the previous permit. Unless a relaxation is allowed pursuant to 402(o) and 40 CFR 122.44(l), the limits and conditions in the reissued permit must be at least as stringent as those in the previous permit.

D. 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 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).

V. Description of Receiving Water

The Merrimack River in the vicinity of the discharge is classified as a Class B water by the New Hampshire State Legislature. The waters of this classification shall be considered as being acceptable for fishing, swimming and other recreational purposes and, after adequate treatment, for use as water supplies.

VI. Permit Basis and Explanation of Effluent Limitation Derivation

A. Flow

Effluent flow must be continuously measured. If the effluent discharged for a period of three consecutive months exceeds 80 percent of the 10.1 MGD design flow (8.1 MGD), the permittee must notify EPA and NHDES-WD, and implement a program for maintaining satisfactory treatment levels. See Part I.A.5 of the proposed Draft Permit.

The facility's design flow rate of 10.1 MGD is used to calculate the mass and concentration limits for five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS), as discussed below.

B. Conventional Pollutants

1. Five-Day Biochemical Oxygen Demand (BOD5) and Total Suspended Solids (TSS)

The average monthly and average weekly concentration-based limits for BOD_5 and TSS are based on requirements under Section 301(b)(1)(B) of the CWA as defined in the Secondary Treatment Standards in 40 CFR Section 133.102(a) and (b). The average monthly and average weekly mass-based limits for BOD_5 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.

Average monthly, average weekly and maximum daily allowable mass-based (load) limitations for BOD_5 and TSS shown in the draft permit are based on the POTW's daily design flow of 10.1 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.

All the concentration-based and mass-based effluent limits for BOD_5 and TSS in the draft permit are the same as the limits in the 2005 permit and, therefore, are consistent with antibacksliding requirements found in 40 CFR §122.44(1). The permittee has been able to achieve consistent compliance with those limits.

Percent removal limits for BOD_5 and of TSS, required under 40 CFR Section 133.102 (a) (3) and (b)(3), respectively, are the same as the limits in the 2005 permit and in accordance with the antibacksliding requirements found in 40 CFR Section 122.44.

The compliance monitoring frequency for BOD_5 and TSS is two per week in the draft permit.

2. pH and Bacteria (E. coli) Limits Including Related Conditions

The limit for pH is based upon State Certification Requirements and RSA 485-A:8, which states that "The pH range for said (Class B) waters shall be 6.5 to 8.0 except when due to natural causes." The limit for *E. coli* is based on requirements in the State's Statutes (N.H. RSA 485-A:8) for non-designated beach area, and Env-Wq 1703.06 (b), which requires that bacteria criteria shall be applied at the end of a wastewater treatment facility's discharge pipe.

Effluent limitations for pH and Escherichia coli bacteria (*E. coli*) in the draft permit are the same as the limits in the 2005 permit and, therefore, are in accordance with antibacksliding requirements found in 40 CFR §122.44(1).

The compliance monitoring frequencies for *E. coli* and pH in the draft permit are 3/week and 1/day, respectively. Samples for *E. coli* compliance monitoring must be taken concurrently with samples for total residual chlorine.

The draft permit includes a provision allowing a relaxation of the pH limits if the permittee performs an in-stream dilution study that demonstrates that the in-stream standards for pH would be protected. If the State approves results from a pH demonstration study, this permit's pH limit range may be relaxed. The notification of the relaxation must be made by certified letter to the permittee from EPA-New England. The pH limit range cannot be less restrictive than 6.0 - 9.0 S.U., the limitations included in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 CFR Part 133) for the facility.

C. Non-Conventional and Toxic Pollutants

Water quality-based limits for specific toxic pollutants such as chlorine, ammonia, and copper are 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 acute aquatic life criteria to protect against short term aquatic life effects, such as death; chronic aquatic life criteria to protect against long term aquatic life effects, such as poor reproduction or impaired growth; and human health criteria to protect water and fish consumption uses. New Hampshire adopted these "Gold Book" criteria, with certain exceptions, and included them as part of the State's Surface Water Quality Regulations. EPA uses these pollutant specific criteria along with available dilution in the receiving water to determine pollutant specific draft permit limits. .

1. Available Dilution

The dilution factor, indicating the available dilution afforded the POTW's effluent by the receiving water, was determined to be 37 in the development of the 2005 permit. For this draft permit, the dilution factor was recalculated to be **32.7,** using a more up-to-date estimate of the 7Q10 low flow in the Merrimack River. The new estimated 7Q10 downstream of the facility of 567.7 cfs (See Attachment C) is based on recalculated 7Q10s for several upstream U.S Geological Survey (USGS) gages and the downstream Goffs Falls USGS gage in Manchester using more recent periods of record. Rather than using the ratio of the drainage areas to estimate the 7Q10 for the intervening drainage area between the USGS gages and the outfall, the new 7Q10 estimate uses the ratio of the flows calculated using the empirical equation for estimating flows in ungaged streams developed by Dr. Lawrence S. Dingman of UNH (Dingman Ratio Proration Method or DRPM). The dilution factor calculation includes a 10 percent Assimilative Capacity Reserve, in accordance with NH Regulation Env-Ws 1705.01.

2. Total Residual Chlorine

The effluent limitations for total residual chlorine (TRC) in the 2005 permit are 0.41 and 0.70 mg/l as average monthly and maximum daily, respectively. In this draft permit, the limits are being lowered to **0.36** and **0.62** mg/l, respectively. These changes are due to the updated dilution factor. The TRC average monthly and maximum daily limitations are based on the chronic and acute aquatic-life criteria, respectively, found in New Hampshire's Surface Water Quality Regulations (Env-Ws 1703.21, Table 1703.1). As detailed in Attachment C, the draft permit limits were calculated by multiplying the chronic criterion (0.011 mg/L) and acute criterion (0.019 mg/L) by the dilution factor for the receiving water (Merrimack River). As indicated in Attachment B, the applicant has been able to achieve consistent compliance with the existing limitations, and the discharge concentration has generally been less than the proposed limits.

3. 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, poor aesthetic quality, and impaired aquatic habitat. 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 had produced several guidance documents which contain recommended total phosphorus criteria for receiving waters. The 1986 Quality Criteria of Water (Gold Book) recommends instream phosphorus concentrations of 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharged directly to lakes or impoundments, 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. Concord is within Ecoregion VIII, *Nutrient Poor Largely Glaciated Upper Midwest and Northeast*. Recommended criteria for this ecoregion is a total phosphorus criterion of 10 ug/l (0.010 mg/l) and chlorophyll *a* criteria of 0.63 ug/l (0.00063 mg/l). These recommended criteria are found in the *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 for 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 reaches 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 uses for New England rivers and streams. The development of the New England-wide total phosphorus concentration was based on more recent data than 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.

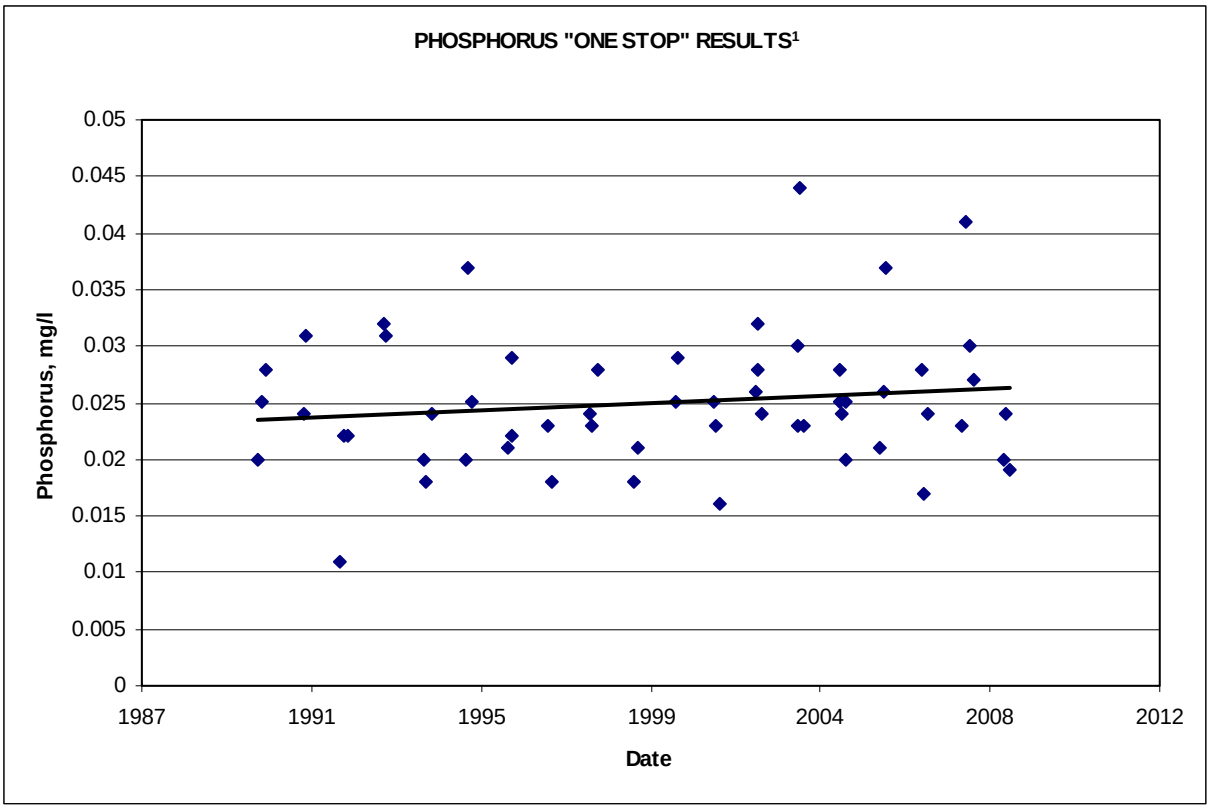
The New Hampshire Surface Water Quality Regulations contain a narrative criterion which states that phosphorus contained in effluent shall not impair a water body's designated use. Specifically, Env-Ws 1703.14(b) states that, "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring." Env-WS 1703.14 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 the NHDES as a level of concern (NHVRAP & NHDES 2002, 2003, and 2005).

As previously discussed, Section 303(d) of the CWA requires states to identify those waterbodies that are not expected to meet surface water quality standards after implementation of technology-based controls and thus require the development of total maximum daily loads (TMDL). Impaired water quality conditions persist in the Merrimack River and have resulted in its listing in the State of New Hampshire's *Final List of Threatened or Impaired Waters That Require a TMDL* (NHDES, 2010), also referred to as the 303(d) list. According to the 303(d) list, aquatic life and primary contact recreational uses in the Merrimack River are threatened in stretches of the river. For instance, aluminum, dissolved oxygen saturation, dissolved oxygen, and pH threaten aquatic life uses just upstream of the Hall Street WWTF discharge and *Escherichia coli* bacteria threatens primary contact recreational uses just upstream of the Hall Street WWTF discharge.

EPA has decided to apply the Gold Book criterion rather than the more stringent ecoregional criteria, given that it was developed from an effects-based approach versus the ecoregional criteria that were developed on the basis of reference conditions. The effects-based approach is taken because it is 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 ecoregional class. They are a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions.

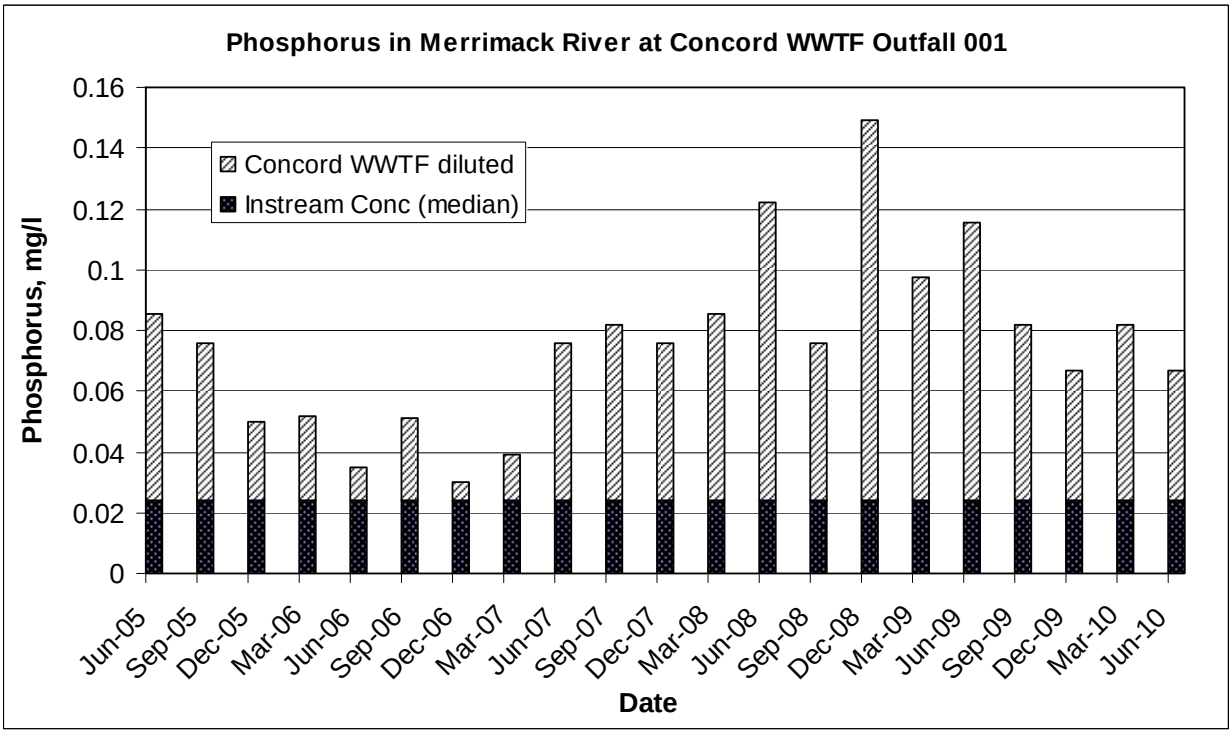
EPA's regulation at 40 CFR 122.44(d)(1) establishes the basis for determining if there is an excursion of numeric or narrative water quality criteria. Section (ii) of that regulation states: "*When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water.*"

The Hall Street WWTF discharges phosphorus into the Merrimack River with a dilution factor of 32.7. An in-stream analysis of phosphorus content was done using the "One Stop" database provided by the NHDES Ambient River Monitoring Program (ARMP) just upstream of the Hall Street WWTF outfall. In-stream phosphorus data taken between 1990 and 2008 (57 data points from Sewells Falls Rd Bridge, upstream of Hall Street WWTF's outfall) was used to determine a median of 0.024 mg/l. This data can be seen in the plot below:



[1] It should be noted that these data were primarily taken between June and August of each year. These months are typically dry months (compare to USGS stream monitoring data) which represent the season when low flow conditions and phosphorus concentration may present the most water quality concerns.

The median value determined from this data was then added to the effluent phosphorus data (divided by the dilution factor) provided by the facility's data monitoring reports (DMRs) from June 2005 to June 2010. A bar graph of the results can be seen below:



As shown in the graph, the calculated total in-stream phosphorus concentration exceeded the Gold Book- recommended total phosphorus criteria (100 ug/l) three times (Jun-08, Dec-08, and Jun-09). Based upon this analysis, a reasonable potential to exceed the phosphorus water quality criteria exists. To address this potential, an effluent concentration limit for phosphorus will be imposed. This numeric limit is determined based upon the following mass balance equation:

$$Q_d C_d + Q_S C_S = Q_r C_r (0.90)$$

where:

Q_d = effluent flow in mgd or cfs (design flow = 10.1 MGD)
C_d = effluent phosphorus concentration in mg/L
Q_S = stream flow in mgd or cfs upstream (7Q10 downstream – design flow)
C_S = background in-stream (median) phosphorus concentration in mg/L (0.024 mg/l)
Q_r = resultant in-stream flow, after discharge in mgd or cfs (7Q10 downstream)
C_r = resultant in-stream pollutant concentration in mg/L (Gold Book criteria: 0.1 mg/l)
0.90 = Factor to reserve 10 % assimilative capacity

Solving for the effluent phosphorus concentration (Cd) gives the maximum allowable concentration the facility may discharge without violating water quality standards. As a result, the average monthly phosphorus limit will be set at **2.42 mg/l** reported as a composite sample and measured once per week.

4. Aluminum

The 2005 permit required toxicity testing to be performed once per quarter. As part of the toxicity testing protocol the effluent and the receiving water upstream of the discharge were analyzed for a number of parameters including total recoverable aluminum. This monitoring was required for the following reasons: to determine the potential causes of toxicity, to determine whether the facility has a reasonable potential to exceed the in-stream water quality criteria for aluminum, and to provide data concerning whether the Merrimack River exceeded in-stream water quality criteria for aluminum on its own. A summary of the aluminum monitoring data from 2005 through 2010 is provided in the table below.

Aluminum Monitoring Data (mg/l)

Date	Eff.	M.R. Toxicity Report[1]	M.R. OneStop[2]
1/7/2005	0.01	0.04	---
4/19/2005	0	0.07	---
6/24/2005	---	---	0.16
7/7/2005	0.19	0.11	---
7/22/2005	---	---	0.08
8/18/2005	---	---	0.071
10/7/2005	0.12	0.087	---
2/7/2006	0.02	0.08	---
4/21/2006	0.013	0.098	---
6/30/2006	---	---	0.267
7/7/2006	0	0.12	---
7/21/2006	---	---	0.096
8/18/2006	---	---	0.054
10/20/2006	0.1	0.12	---
1/19/2007	0.16	1.6	---
4/5/2007	0.065	0.12	---
6/22/2007	---	---	0.067
7/3/2007	0.02	0.071	---
7/20/2007	---	---	0.162
8/24/2007	---	---	0.046
10/17/2007	0	0.13	---
1/23/2008	0.04	0.086	---
4/22/2008	0.06	0.24	---
6/25/2008	---	---	0.088
7/2/2008	0.07	0.14	---
7/14/2008	---	---	0.052
8/22/2008	---	---	0.116
10/21/2008	0.03	0.06	---
2/10/2009	0.04	---	---
4/21/2009	0.04	0.1	---
7/22/2009	0.05	0.05	---
10/2/2009	0.04	0.04	---
4/6/2010	0.044	0.22	---

Ave	0.053	0.1791	0.105
Max	0.19	1.6	0.267
Min	0	0.04	0.046

[1] Data taken from toxicity (WET) reports from the Merrimack River submitted by the Hall Street WWTF
[2] Data taken from the "One Stop" database provided by the NHDES Ambient River Monitoring Program (ARMP), from monitoring station at Sewalls Falls Rd Bridge, upstream of the Hall Street WWTF outfall on the Merrimack River

The New Hampshire Standards include acute and chronic in-stream water quality criteria for aluminum of 0.750 and 0.087 mg/l, respectively. The sampling data from 2005 through 2010 shows that the chronic in-stream water quality criteria for aluminum in the Merrimack River upstream of the outfall was exceeded 53% of the time (17 out of 32 samples). The results that exceed the chronic criteria of 0.087 mg/l are highlighted above.

Although upstream data shows that the 0.087 mg/l chronic criterion for aluminum is often exceeded in-stream, recent effluent data does not support the need for a chronic aluminum limit. The chronic criterion has not been exceeded in the effluent since April of 2007. In order to ensure that the effluent does not cause or contribute to an in-stream violation of the chronic criterion in the future, aluminum monitoring will be required twice per month, as indicated in the draft permit.

D. Whole Effluent Toxicity (WET)

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 the nation's waterways. 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 "additivity" 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.

New Hampshire law states that, "all surface 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;...." (N.H. RSA 485-A:8, VI and the N.H. Code of Administrative Rules, PART Env-Ws 1730.21(a)(1)). 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 criterion for toxicity. Furthermore, results of these toxicity tests will demonstrate compliance of the POTW's discharge with the "no toxic provision of the NH Standards."

Accordingly, to fully implement the "integrated strategy" and to protect the "no toxic provision of the NH Standards," EPA-New England requires toxicity testing in all municipal permits. The effluent limitation in the draft permit for LC50 is the same as the 2005 permit and, therefore, is in accordance with the antibacksliding requirements found in 40 CFR Section 122.44(1).

The LC50 is defined as the percentage of effluent that would be lethal to 50 % of the test organisms during an exposure of 48 hours (static acute toxicity test). The 2005 permit and this draft permit establish the LC50 limit at 100%, meaning a sample of 100 % effluent shall have no greater than a 50 % mortality rate in that effluent sample. The 2005 permit and this draft permit require the permittee to collect and test effluent samples quarterly (calendar quarters ending March 31st, June 30th, September 30th and December 31st) using two species, Ceriodaphia dubia (Daphnia) and Pimephales promelas (Fathead Minnow).

The permittee has been able to show consistent compliance with the Daphnia LC50, but has not been able to shown consistent compliance with the Fathead Minnow LC50 limit. Four (4) violations have been reported between June 2006 and March 2010. The draft permit requires the permittee to continue quarterly WET testing. If future testing indicates a failure to consistently meet the LC50 for the Fathead Minnow, the permittee may be required to conduct a Toxicity Reduction Evaluation.

The WET limits in the draft permit include conditions to allow EPA-New England to modify, or alternatively, revoke and reissue to incorporate additional toxicity testing requirements, including chemical specific limits, if the results of the toxicity tests indicate the discharge causes an exceedance of any State water quality criterion. Results from these toxicity tests are considered "New Information" and the permit may be modified as provided in 40 CFR §122.62(a)(2). Alternately, if a permittee has consistently demonstrated on a maximum daily basis that its discharge, based on data for the most recent one-year period, or four sampling events, whichever yields the greater time period, causes no acute and chronic toxicity, the permitted limits will be considered eligible for a reduced frequency of toxicity testing. This reduction in testing frequency is evaluated on a case-by-case basis.

Accordingly, a special condition has been carried forward from the 2005 permit into the draft permit that allows for a reduced frequency of WET testing using a certified letter from EPA-New England. This permit provision anticipates the time when the permittee requests a reduction in WET testing that is approvable by both EPA-New England and the NHDES-WD. As previously stated, EPA-New England's current policy is that after completion of a minimum of four consecutive WET tests, all of which must be valid tests and must demonstrate compliance with the permit limits for whole effluent toxicity, the permittee may submit a written request to EPA-New England seeking a review of the toxicity test results. EPA-New England's policy is to reduce the frequency of toxicity testing to no less than one (one-species) test per year. The permittee is required to continue testing at the frequency specified in the permit until the permit is either formally modified or until the permittee receives a certified letter from the EPA-New England indicating a change in the permit condition. This special condition does not negate the permittee's right to request a permit modification at any time prior to the permit expiration.

This draft permit, as in the 2005 permit, requires the permittee to continue reporting selected

parameters from the chemical analysis of the WET tests' 100 percent effluent sample. Specifically, hardness, total ammonia nitrogen as nitrogen, and total recoverable aluminum, cadmium, copper, lead, nickel and zinc are to be reported on the appropriate DMR for entry into EPA's Permit Compliance System's Data Base. EPA-New England does not consider these reporting requirements an unnecessary burden as reporting these constituents is already required with the submission of each toxicity testing report.

E. 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 Part 503 technical standards and to State Env-Wq 800 standards. 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 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, EPA-New England has prepared a 72-page document entitled "EPA Region I NPDES Permit Sludge Compliance Guidance" for use by the permittee in determining their appropriate sludge conditions for their chosen method of sewage sludge use or disposal practices. This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf . The permittee is required to submit an annual report to EPA-New England and NHDES-WD, by February 19th each year, containing the information specified in the Sludge Compliance Guidance document for their chosen method of sewage sludge use or disposal practices.

The permittee is required to submit an annual report to EPA-New England and NHDES-WD, by February 19th each year, containing the information specified in the Sludge Compliance Guidance document for their chosen method of sewage sludge use or disposal practices.

In addition to processing its own sludge, the Hall Street facility also accepts and processes sludge from three other New Hampshire POTWs: Sunapee, Warner and Penacook. On its sewage sludge permit application dated September 18, 2009, the City reports that that it annually generates about 2,500 metric tons of sludge at the Hall Street facility and receives from Sunapee, Warner and Penacook about 55, 5 and 65 metric tons, respectively. The combined sludge is dewatered, amended and lime-stabilized (to pH > 12) in a thermo-blender, and pasteurized to produce a finished biosolid that is land applied. The permittee identified Resource Management Inc. of Ashland, NH, as the company that land applies the sludge at 10 sites providing nutrients for feed crops (i.e., hay, corn silage or grain).

F. Industrial Users (Pretreatment Program)

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 2005 permit that were consistent with the EPA 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.

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 June 1st a pretreatment report detailing the activities of the program for the twelve month period ending 60 days prior to the due date.

G. 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.

H. Antidegradation

This draft permit is being reissued with BOD_5, TSS, pH and *E. coli* effluent limitations identical to those in the current permit, a more stringent limitation for total residual chlorine, and additional limitations for total phosphorus and total recoverable aluminum, with no change in outfall location. The State of New Hampshire has indicated that there is no lowering of water quality and no loss of existing water uses and that no additional antidegradation review is warranted at this time.

I. Additional Requirements and Conditions

The effluent monitoring requirements in the draft permit have been established to yield data representative of the discharge under the authority of Section 308(a) of the CWA in accordance with 40 CFR § 122.41(j), § 122.44(i) and § 122.48. In the draft permit, compliance monitoring frequency and sample type for Flow, BOD_5, TSS, pH, total residual chlorine, *Escherichia coli* bacteria, and total recoverable aluminum are consistent with the latest version of EPA/NHDES-WD's Effluent Monitoring Guidance (EMG) mutually agreed upon and first implemented in March 1993 and last revised on July 19, 1999. In addition, the WET test monitoring requirements have been set according to EPA-New England's Municipal Toxicity Policy.

The remaining conditions of the permit are based on the NPDES regulations 40 CFR, Parts 122 through 125, and consist primarily of management requirements common to all permits.

J. 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 Fish and Game Department, Atlantic salmon are stocked further upstream in the Merrimack River watershed but not in this area. This stretch of the river is used by salmon smolts in spring months for downstream passage to the sea. Adult Atlantic salmon returning to the river from the ocean do not make it up this far because they are collected at a dam in Lawrence, Massachusetts primarily for use as broodstock.

- The permit prohibits the discharge to cause a violation of State water quality standards.
- The permit contains water quality based limits for total residual chlorine.
- The permit prohibits the discharge of pollutants or combinations of pollutants in toxic amounts.
- The permit requires toxicity testing four (4) times per year to ensure that the discharge does not present toxicity problems.

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 impact to EFH are detected as a result of this permit action or if new information becomes available that changes the basis for these conclusions.

K. Endangered Species

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure 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 United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NOAA Fisheries) administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish and wildlife to see if any such listed species might potentially be impacted by the re-issuance of this NPDES permit. Based on the normal distribution of these species, it is highly unlikely that they would be present in the vicinity of this discharge. Furthermore, effluent limitations and other permit conditions

which are in place in this Draft Permit should preclude any adverse effects should there be any incidental contact with listed species in the Merrimack River.

EPA believes the proposed limits are sufficiently stringent to assure that water quality standards will be met and to ensure protection of aquatic life and maintenance of the receiving water as an aquatic habitat. The Region finds that adoption of the proposed permit is unlikely to adversely affect any threatened or endangered species or its critical habitat. If adverse effects do occur as a result of this permit action, or if new information becomes available that changes the basis for this conclusion, then EPA will notify and initiate consultation with both the USFWS and the NOAA Fisheries. A copy of the Draft Permit has been provided to both USFWS and NOAA Fisheries for review and comment.

VII. Monitoring and Reporting

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308 (a) of the CWA in accordance with 40 CFR §§122.41 (j), 122.44 (l), and 122.48.

The Draft Permit includes new provisions related to Discharge Monitoring Report (DMR) submittals to EPA and the State. The Draft Permit requires that, no later than one year after the effective date of the permit, the permittee submit all monitoring data and other reports required by the permit to EPA using NetDMR, unless the permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt-out request").

In the interim (until one year from the effective date of the permit), the permittee may either submit monitoring data and other reports to EPA in hard copy form, or report electronically using NetDMR.

NetDMR is a national web-based tool for regulated Clean Water Act permittees to submit discharge monitoring reports (DMRs) electronically via a secure Internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR § 122.41 and § 403.12. NetDMR is accessed from the following url: http://www.epa.gov/netdmr. Further information about NetDMR, including contacts for EPA Region 1, is provided on this website.

EPA currently conducts free training on the use of NetDMR, and anticipates that the availability of this training will continue to assist permittees with the transition to use of NetDMR. To participate in upcoming trainings, visit http://www.epa.gov/netdmr for contact information for New Hampshire.

The Draft Permit requires the permittee to report monitoring results obtained during each calendar month using NetDMR, no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA or to NHDES.

The Draft Permit also includes an "opt-out" request process. Permittees who believe they can not use NetDMR due to technical or administrative infeasibilities, or other logical reasons, must demonstrate the reasonable basis that precludes the use of NetDMR. These permittees must submit the justification, in writing, to EPA at least sixty (60) days prior to the date the facility would otherwise be required to begin using NetDMR. Opt-outs become effective upon the date of written approval by EPA and are valid for twelve (12) months from the date of EPA approval. The opt-outs expire at the end of this twelve (12) month period. Upon expiration, the permittee must submit DMRs and reports to EPA using NetDMR, unless the permittee submits a renewed opt-out request sixty (60) days prior to expiration of its opt-out, and such a request is approved by EPA.

Until electronic reporting using NetDMR begins, or for those permittees that receive written approval from EPA to continue to submit hard copies of DMRs, the Draft Permit requires that submittal of DMRs and other reports required by the permit continue in hard copy format. Hard copies of DMRs must be postmarked no later than the 15th day of the month following the completed reporting period.

VIII. 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 contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards or waives its right to certify as set forth in 40 CFR §124.53. State Water Quality Standards contain three major elements: Beneficial uses; Water Quality Criteria; and an Antidegradation Policy, all of which are part of the State's Water-Quality Certification under Section 401 of the Act. **The only exception to this is that sludge conditions/requirements are not part of the Section 401 State Certification.** The staff of the NHDES-WD has reviewed the draft permit and advised EPA-New England that the limitations are adequate to protect water quality. EPA-New England 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.

IX. 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: **Mr. Michael Cobb, U.S. Environmental Protection Agency, Region 1 (New England), 5 Post Office Square - Suite 100, Mail Code OEP06-1, Boston, MA 02109-3912**. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA-New England and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty 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-New England's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, 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.

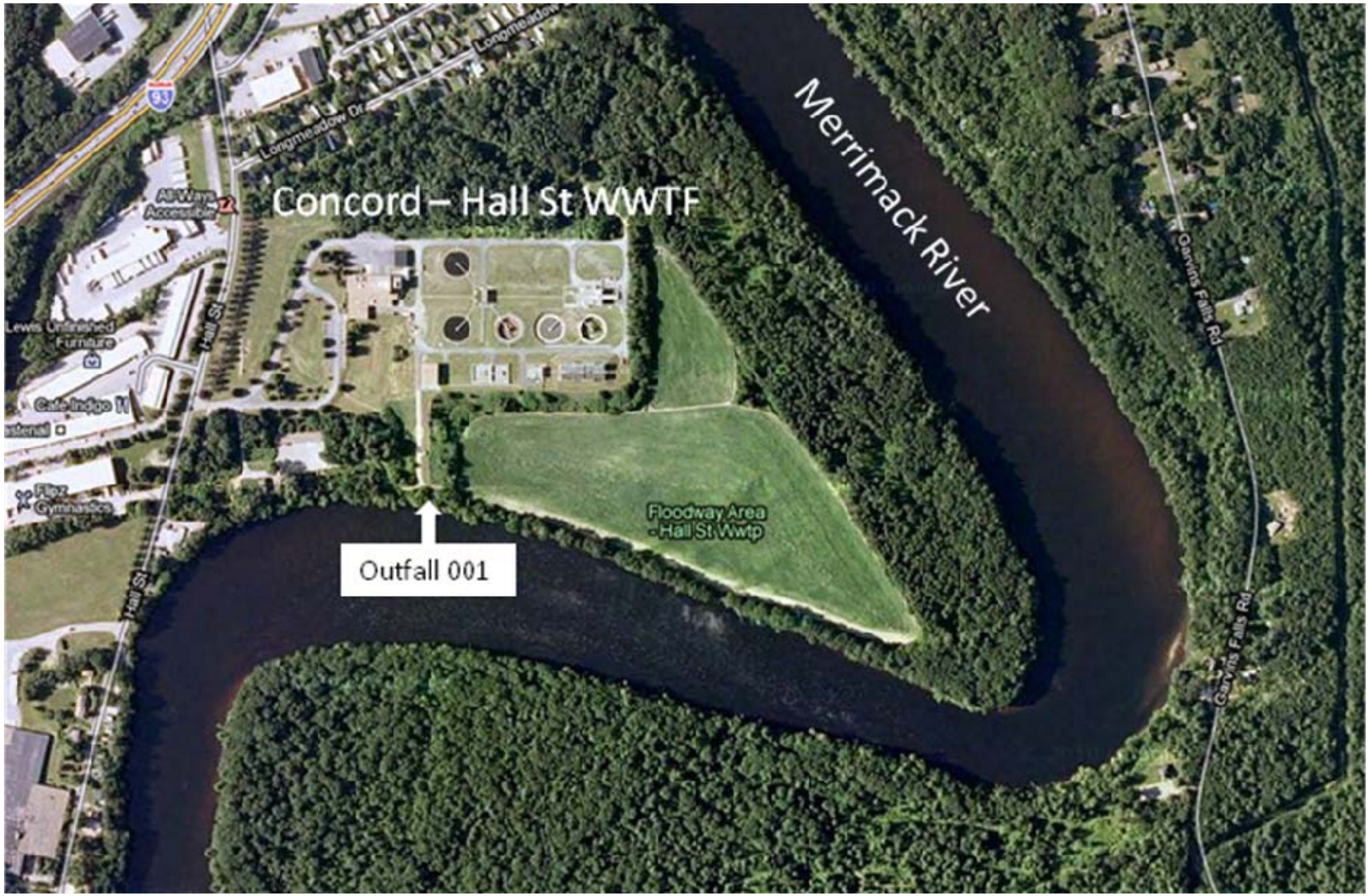
X. EPA-New England/State Contacts

Additional information concerning the draft permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M. (8:00 A.M. and 4:00 P.M. for the state), Monday through Friday, excluding holidays from:

Mr. Michael Cobb, Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection
5 Post Office Square
Suite 100, Mail Code: OEP06-1
Boston, Massachusetts 02109-3912
Telephone No.: (617) 918-1369
FAX No.: (617) 918-0369

_____ **Stephen S. Perkins, Director**
Date: **Office of Ecosystem Protection**
U.S. Environmental Protection Agency

ATTACHMENT A – LOCATION OF CONCORD HALL STREET WWTF



Aerial image obtained from Google Maps (http://maps.google.com)

ATTACHMENT B - DMR DATA SUMMARY (OUTFALL 001)

Monitoring Period End Date	BOD5						
	Monthly Ave		Weekly Ave		Daily Max		Removal
	lb/d	mg/L	lb/d	mg/L	lb/d	mg/L	%
5/31/2005	1007.	22.	1117.	26.	1235.	28.	93.5
6/30/2005	894.	20.	982.	21.	1266.	26.	95.
7/31/2005	594.	17.	690.	18.	791.	20.	95.4
8/31/2005	559.	16.	668.	19.	792.	23.	96.1
9/30/2005	647.	17.	828.	22.	929.	25.	96.1
10/31/2005	779.	15.	1029.	18.	1029.	19.	95.7
11/30/2005	681.	12.	794.	14.	1048.	16.	97.3
12/31/2005	785.	16.	935.	21.	935.	21.	96.5
1/31/2006	613.	11.	818.	12.	950.	13.	97.5
2/28/2006	724.	15.	870.	16.	1009.	24.	96.4
3/31/2006	685.	15.	834.	20.	872.	19.	97.
4/30/2006	616.	13.	712.	14.	802.	14.	97.4
5/31/2006	1890.	18.	**6776.**	32.	**7506.**	36.	95.1
6/30/2006	541.	10.	716.	14.	830.	15.	97.2
7/31/2006	513.	13.	686.	16.	697.	18.	97.6
8/31/2006	375.	11.	416.	12.	543.	16.	97.
9/30/2006	660.	17.	860.	18.	1171.	19.	96.9
10/31/2006	771.	17.	870.	20.	1005.	24.	96.3
11/30/2006	705.	13.	896.	16.	1187.	18.	96.2
12/31/2006	831.	17.	996.	20.	1079.	22.	95.8
1/31/2007	1235.	25.	1238.	26.	1535.	35.	95.
2/28/2007	1202.	28.	1522.	34.	1515.	35.	93.7
3/31/2007	1286.	28.	1500.	33.	1503.	34.	94.1
4/30/2007	1071.	19.	1561.	25.	2005.	25.	94.3
5/31/2007	464.	10.	610.	11.	616.	12.	97.4
6/30/2007	354.	9.	431.	12.	470.	12.	97.9
7/31/2007	529.	16.	542.	16.	650.	19.	96.9
8/31/2007	732.	22.	986.	30.	1097.	34.	96.
9/30/2007	504.	15.	608.	18.	634.	19.	97.
10/31/2007	535.	16.	994.	28.	1501.	41.	96.6
11/30/2007	494.	14.	624.	17.	731.	19.	97.3
12/31/2007	457.	13.	468.	13.	481.	13.	97.8
1/31/2008	522.	12.	727.	16.	788.	17.	97.8
2/29/2008	717.	13.	901.	14.	1218.	16.	96.9
3/31/2008	1105.	17.	1487.	22.	1600.	22.	94.3
4/30/2008	822.	12.	1376.	18.	1383.	19.	96.3
5/31/2008	639.	13.	920.	20.	942.	21.	97.4
6/30/2008	714.	16.	854.	18.	916.	20.	97.1
7/31/2008	---	18.	---	25.	---	27.	96.8
8/31/2008	---	16.	---	20.	---	24.	96.7
9/30/2008	---	13.	---	14.	---	17.	97.4

10/31/2008	612.	18.	665.	24.	736.	27.	96.5
11/30/2008	673.	18.	1120.	20.	1380.	21.	96.2
12/31/2008	878.	18.	1024.	21.	1143.	23.	96.
1/31/2009	696.	20.	1016.	24.	803.	25.	95.7
2/28/2009	634.	18.	798.	24.	809.	24.	96.6
3/31/2009	579.	12.	642.	14.	921.	16.	97.
4/30/2009	442.	9.	796.	14.	670.	13.	97.4
5/31/2009	508.	14.	558.	16.	611.	19.	96.8
6/30/2009	655.	20.	624.	22.	1238.	38.	95.9
7/31/2009	433.	12.	863.	26.	787.	19.	98.
8/31/2009	533.	17.	688.	22.	824.	25.	97.2
9/30/2009	561.	17.	1058.	26.	1413.	33.	96.6
10/31/2009	419.	13.	579.	16.	703.	17.	97.3
11/30/2009	329.	10.	346.	10.	395.	13.	97.5
12/31/2009	415.	12.	532.	15.	578.	17.	97.6
1/31/2010	423.	12.	501.	13.	537.	13.	97.
2/28/2010	483.	14.	536.	16.	563.	16.	96.
3/31/2010	529.	11.	620.	13.	801.	16.	96.2
4/30/2010	455.	13.	720.	16.	550.	17.	95.9
5/31/2010	550.	18.	787.	24.	874.	27.	95.7
6/30/2010	486.	13.	545.	16.	800.	22.	98.
7/31/2010	473.	15.	696.	19.	744.	21.	97.6
8/31/2010	385.	12.	415.	13.	617.	17.	97.9
Permit Limit	**2529**	**30**	**3793**	**45**	**4214**	**50**	**85**
Average	662	15	918	19	---	---	97
Minimum	329	9	346	10	395	12	94
Maximum	1890	28	6776	34	7506	41	98
Standard Deviation	268.8	4.0	812.5	5.5	903.9	6.8	1.1
# of Measurements	61	64	61	64	61	64	64
# Exceeds Limits	0	0	1	0	1	0	0

Monitoring Period End Date	TSS						
	Monthly Ave		Weekly Ave		Daily Max		Removal
	lb/d	mg/L	lb/d	mg/L	lb/d	mg/L	% Removal
5/31/2005	472.	10.	500.	11.	565.	13.	97.1
6/30/2005	374.	8.	407.	9.	487.	10.	98.4
7/31/2005	227.	6.	276.	8.	384.	11.	98.3
8/31/2005	225.	6.	261.	8.	372.	10.	98.2
9/30/2005	292.	8.	344.	9.	368.	10.	97.4
10/31/2005	383.	7.	574.	10.	593.	10.	97.7
11/30/2005	232.	4.	250.	4.	393.	6.	98.9
12/31/2005	336.	7.	402.	9.	483.	9.	97.4
1/31/2006	269.	5.	472.	7.	658.	9.	98.5
2/28/2006	416.	9.	506.	9.	79.	19.	97.5
3/31/2006	318.	7.	544.	13.	486.	10.	98.8
4/30/2006	256.	6.	299.	7.	347.	8.	98.9
5/31/2006	1249.	10.	**5108.**	24.	**5838.**	28.	97.8
6/30/2006	238.	4.	377.	7.	453.	6.	99.
7/31/2006	242.	6.	464.	11.	542.	14.	98.2
8/31/2006	68.	2.	84.	2.	102.	3.	99.2
9/30/2006	225.	6.	365.	8.	455.	8.	98.3
10/31/2006	377.	9.	428.	9.	502.	12.	98.
11/30/2006	364.	7.	492.	8.	726.	11.	97.7
12/31/2006	465.	10.	624.	12.	638.	13.	97.2
1/31/2007	705.	14.	738.	15.	1025.	21.	96.4
2/28/2007	650.	15.	949.	22.	1162.	27.	95.9
3/31/2007	616.	13.	750.	14.	788.	15.	97.2
4/30/2007	644.	11.	992.	15.	1185.	16.	96.
5/31/2007	275.	5.	522.	8.	617.	10.	98.7
6/30/2007	123.	3.	185.	4.	164.	4.	99.2
7/31/2007	106.	3.	152.	4.	199.	6.	99.2
8/31/2007	161.	5.	200.	6.	300.	9.	98.7
9/30/2007	138.	4.	190.	6.	213.	5.	98.9
10/31/2007	210.	6.	994.	8.	403.	11.	98.1
11/30/2007	246.	7.	303.	9.	406.	12.	98.
12/31/2007	179.	5.	236.	6.	255.	7.	98.9
1/31/2008	222.	5.	272.	6.	337.	8.	98.8
2/29/2008	473.	9.	674.	10.	990.	13.	97.8
3/31/2008	768.	12.	1076.	16.	1091.	17.	95.6
4/30/2008	465.	7.	840.	11.	874.	12.	98.1
5/31/2008	282.	6.	391.	8.	404.	9.	98.9
6/30/2008	184.	4.	230.	5.	321.	7.	99.
7/31/2008	---	4.	---	8.	---	8.	98.8
8/31/2008	---	5.	---	9.	---	10.	98.5
9/30/2008	---	5.	---	6.	---	7.	98.5
10/31/2008	166.	6.	218.	8.	273.	10.	98.4
11/30/2008	231.	6.	466.	8.	526.	9.	98.2

12/31/2008	506.	10.	758.	14.	806.	14.	97.4
1/31/2009	508.	15.	591.	19.	674.	21.	97.1
2/28/2009	487.	14.	628.	18.	640.	19.	96.8
3/31/2009	290.	6.	356.	8.	475.	10.	98.7
4/30/2009	244.	5.	474.	11.	994.	22.	98.5
5/31/2009	153.	4.	190.	6.	221.	7.	99.
6/30/2009	331.	10.	260.	8.	1206.	37.	97.4
7/31/2009	186.	5.	716.	22.	290.	7.	98.6
8/31/2009	288.	9.	419.	14.	519.	17.	97.2
9/30/2009	409.	13.	736.	25.	1102.	36.	96.3
10/31/2009	235.	7.	278.	10.	414.	14.	98.2
11/30/2009	156.	5.	226.	6.	239.	7.	98.7
12/31/2009	222.	6.	294.	8.	338.	9.	98.2
1/31/2010	256.	7.	304.	8.	350.	10.	97.
2/28/2010	288.	8.	386.	10.	484.	13.	96.5
3/31/2010	258.	6.	328.	8.	384.	9.	97.8
4/30/2010	182.	5.	301.	7.	457.	10.	97.5
5/31/2010	172.	5.	246.	6.	276.	7.	98.2
6/30/2010	234.	6.	324.	8.	410.	10.	98.2
7/31/2010	205.	7.	284.	8.	320.	10.	98.6
8/31/2010	139.	4.	132.	5.	327.	9.	99.
Permit Limit	**2529**	**30**	**3793**	**45**	**4214**	**50**	**85**
Average	322	7	515	10	---	---	98.0
Minimum	68	2	84	2	79	3	95.6
Maximum	1249	15	5108	25	5838	37	99.2
Standard Deviation	195.4	3.0	641.2	4.8	736.1	6.7	0.9
# of Measurements	61	64	61	64	61	64	64
# Exceeds Limits	0	0	1	0	1	0	0

Monitoring Period End Date	Total Residual Chlorine		E. coli		Flow		pH	
	Mon Ave	Max Day	Mon Ave	Max Day	Mon Ave	Max Day	Min	Max
	mg/l	mg/l	#/100mL	#/100mL	mgd	mgd	SU	SU
5/31/2005	.307	.4	29.	62.	5.56	6.89	6.92	7.84
6/30/2005	.266	.43	17.	45.	5.11	5.91	6.92	7.4
7/31/2005	.221	.35	24.	152.	4.15	5.78	7.	7.51
8/31/2005	.218	.35	38.	136.	4.15	5.43	6.84	7.38
9/30/2005	.32	.51	10.	20.	4.39	5.23	7.02	7.41
10/31/2005	.369	.57	13.	252.	6.74	11.63	6.69	7.28
11/30/2005	.301	.51	25.	136.	6.35	7.85	6.87	7.2
12/31/2005	.319	.45	43.	185.	5.91	7.86	6.75	7.44
1/31/2006	.281	.35	29.	68.	6.24	8.76	6.8	7.37
2/28/2006	.27	.39	68.	160.	5.86	7.55	6.97	7.42
3/31/2006	.282	.37	9.	120.	5.35	5.83	6.98	7.43
4/30/2006	.313	.43	4.	8.	5.36	6.87	7.04	7.44
5/31/2006	.305	.54	23.	**2950.**	10.68	25.	6.6	7.48
6/30/2006	.262	.43	8.	32.	6.88	10.39	6.91	7.4
7/31/2006	.193	.44	25.	308.	4.74	6.03	7.04	7.47
8/31/2006	.182	.26	27.	71.	4.16	4.97	6.93	7.46
9/30/2006	.159	.54	34.	100.	4.33	8.2	6.86	7.54
10/31/2006	.331	.49	71.	380.	5.25	7.61	7.1	7.44
11/30/2006	.312	.41	37.	106.	6.16	7.91	6.97	7.61
12/31/2006	.299	.43	64.	109.	5.9	8.67	6.99	7.43
1/31/2007	.318	.44	68.	223.	5.91	7.3	7.04	7.45
2/28/2007	.215	.3	27.	86.	5.24	5.72	7.11	7.43
3/31/2007	.172	.45	19.	152.	5.6	6.63	7.16	7.46
4/30/2007	.244	.47	65.	348.	7.43	12.5	6.93	7.47
5/31/2007	.4	.31	23.	72.	5.87	7.4	7.09	7.41
6/30/2007	.332	.44	18.	89.	4.59	5.6	7.16	7.45
7/31/2007	.305	.43	16.	68.	4.05	5.42	7.15	7.52
8/31/2007	.28	.35	21.	72.	3.97	4.66	7.25	7.55
9/30/2007	.267	.35	16.	44.	3.82	5.11	7.3	7.61
10/31/2007	.272	.35	12.	43.	3.96	4.53	7.33	7.62
11/30/2007	.295	.35	5.	17.	4.09	5.12	7.28	7.56
12/31/2007	.31	.39	4.	21.	4.35	4.76	7.27	7.58
1/31/2008	.28	.51	3.	20.	5.06	6.84	7.24	7.5
2/29/2008	.367	.52	4.	16.	6.12	9.13	7.03	7.53
3/31/2008	.321	.58	56.	**727.**	7.83	10.56	6.98	7.42
4/30/2008	.285	.49	53.	238.	7.65	9.66	7.04	7.34
5/31/2008	.211	.33	50.	154.	5.97	7.34	7.1	7.44
6/30/2008	.243	.38	21.	228.	5.5	5.93	7.26	7.57
7/31/2008	.239	.43	13.	82.	---	---	7.12	7.45
8/31/2008	.265	.37	41.	158.	---	---	7.16	7.48
9/30/2008	.3	.49	14.	34.	---	---	---	---
10/31/2008	.255	.38	17.	55.	3.68	4.72	7.05	7.47

11/30/2008	.27	.5	11.	31.	4.11	7.88	7.06	7.36
12/31/2008	.323	.58	80.	387.	5.92	9.03	7.03	7.42
1/31/2009	.268	.62	106.	290.	4.02	5.47	7.22	7.55
2/28/2009	.106	.38	6.	71.	4.17	4.97	7.28	7.53
3/31/2009	.199	.39	2.	35.	5.38	7.52	7.21	7.5
4/30/2009	.275	.44	2.	5.	5.94	9.77	7.21	7.49
5/31/2009	.311	.47	24.	122.	4.2	5.6	7.07	7.47
6/30/2009	.348	.64	7.	291.	3.89	4.88	7.14	7.45
7/31/2009	.258	.42	3.	12.	4.4	7.25	6.79	7.36
8/31/2009	.266	.46	10.	**579.**	4.06	6.18	6.69	7.29
9/30/2009	.313	.52	22.	84.	3.38	5.14	7.25	7.55
10/31/2009	.365	.53	21.	43.	3.81	4.96	7.01	7.68
11/30/2009	.335	.55	28.	196.	4.03	5.9	7.11	7.6
12/31/2009	.326	.53	23.	160.	4.22	5.74	7.13	7.53
1/31/2010	.383	.49	19.	285.	4.29	6.1	7.15	7.53
2/28/2010	.357	.45	67.	197.	4.31	6.59	6.93	7.59
3/31/2010	.37	.52	48.4	**816.4**	5.12	8.06	6.88	7.47
4/30/2010	.326	.55	6.	35.	4.39	7.28	7.11	7.6
5/31/2010	.266	.48	7.	20.	3.72	4.74	7.04	7.61
6/30/2010	.302	.47	12.6	38.8	4.22	4.92	6.79	7.48
7/31/2010	.316	.51	65.	313.	3.64	5.08	7.03	7.43
8/31/2010	.276	.59	69.	206.	3.37	5.32	7.29	7.56
Permit Limit	**0.41**	**0.7**	**126**	**406**	**Report**	**Report**	**6.5**	**8**
Average	.285	---	28.2	---	5.06	---	---	---
Minimum	.106	.260	2.0	5.0	3.37	4.53	6.60	---
Maximum	.400	.64	106.0	2950.0	10.68	25.00	---	7.84
Standard Deviation	0.1	0.1	23.4	384.8	1.3	3.0	0.2	0.1
# of Measurements	64	64	64	64	61	61	63	63
# Exceeds Limits	0	0	0	4	N/A	N/A	0	0

Monitoring Period End Date	Aluminum (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Copper (mg/l)	Lead (mg/l)	Nickel (mg/l)	Zinc (mg/l)	Hardness (as CaCO3) (mg/l)	Ammonia Nitrogen as N (mg/l)	Phosphorus (as P) (mg/l)	LC50 (%) Daphnid	LC50 (%) Minnow
6/30/2005	0.	0.	0.	0.013	0.	0.	0.051	48.	21.	2.	100.	100.
9/30/2005	0.19	0.001	0.009	0.016	0.029	0.018	0.056	15.	21.	1.7	100.	100.
12/31/2005	0.12	0.002	0.004	0.011	0.026	0.01	0.046	16.	0.1	0.84	100.	100.
3/31/2006	0.026	0.	0.	0.012	0.	0.0062	0.041	71.	24.	0.91	100.	100.
6/30/2006	0.013	0.	0.	0.009	0.	0.	0.053	43.	28.	0.35	100.	**97.3**
9/30/2006	0.	0.	0.	0.01	0.	0.005	0.036	46.	20.	0.88	100.	100.
12/31/2006	0.1	0.	0.003	0.01	0.011	0.007	0.038	42.	24.	0.19	100.	100.
3/31/2007	0.16	0.	0.	0.01	0.	0.	0.046	53.	0.64	0.49	100.	100.
6/30/2007	0.065	0.	0.	0.008	0.	0.	0.049	54.	23.	1.7	100.	100.
9/30/2007	0.02	0.	0.002	0.011	0.	0.005	0.04	45.	21.	1.9	100.	100.
12/31/2007	0.	0.	0.	0.01	0.	0.003	0.045	46.	31.	1.7	100.	100.
3/31/2008	0.04	0.	0.002	0.007	0.	0.	0.047	57.	24.	2.	100.	100.
6/30/2008	0.06	0.	0.002	0.008	0.0017	0.	0.048	61.	22.	3.2	100.	100.
9/30/2008	0.07	0.	0.001	0.011	0.0015	0.0037	0.053	48.	23.	1.7	100.	100.
12/31/2008	0.03	0.	0.002	0.004	0.	0.	0.03	48.	22.	4.1	100.	100.
3/31/2009	0.04	0.	0.	0.011	0.002	0.002	0.051	41.	24.	2.4	100.	100.
6/30/2009	0.04	0.	0.	0.008	0.0007	0.002	0.028	56.	26.	3.	100.	**68.4**
9/30/2009	0.05	0.	0.	0.006	0.0005	0.003	0.045	51.	10.	1.9	100.	100.
12/31/2009	0.04	0.	0.	0.009	0.	0.002	0.022	47.	33.	1.4	100.	**72.8**
3/31/2010	0.02	0.0005	0.002	0.009	0.0008	0.002	0.023	41.	28.	1.9	100.	**76.5**
6/30/2010	0.044	0.	0.	0.007	0.	0.	0.025	53.	19.	1.4	100.	100.
Permit Limit	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**Report**	**100.**	**100.**
Average	0.054	0.0002	0.001	0.01	0.003	0.003	0.042	46.8	21.2	1.7	100.	96.
Minimum	0.	0.	0.	0.004	0.	0.	0.022	15.	0.1	0.19	100.	68.4
Maximum	0.19	0.002	0.009	0.016	0.029	0.018	0.056	71.	33.	4.1	100.	100.

ATTACHMENT C – EFFLUENT LIMIT CALCULATIONS

CALCULATIONS OF MASS-BASED LIMITS

Calculations of maximum allowable loads for average monthly BOD_5 and TSS are based on the following equation.

$$L = C \times Q_{PDF} \times 8.345$$

where:

L = Maximum allowable load, in lbs/day, rounded to nearest 1 lbs/day.
C = Maximum allowable effluent concentration for reporting period, in mg/L.
Q_{PDF} = Treatment plant's design flow, in MGD
8.345 = Factor to convert effluent concentration (mg/L) times design flow (MGD) to lbs/day

DERIVATION OF 7Q10 LOW-FLOW AT OUTFALL 001

Concord Hall Street WWTF was designed to process a wastewater flow of 10.1 MGD and to discharge that treated effluent into the Merrimack River. The 7Q10 low flow on the Merrimack River just downstream of the plant's Outfall 001 was estimated using the gaging stations upstream (Franklin Junction) and downstream (Goffs Falls) of the outfall that are located on the main stem of the Merrimack River, gaging stations on several tributaries between these two Merrimack River gages, as well as the Dingman Ratio Proration Method (DRPM). The details of these gaging stations are given here:

<u>USGS Gages on the main stem of the Merrimack River:</u>

Merrimack River at Franklin Junction, NH; USGS Gage No. 01081500
Upstream of Outfall 001;
Drainage Area (DA): 1,507 mi^2;
7Q10 low-flow value: 477.825 CFS.

Merrimack River near Goffs Falls, below Manchester; USGS Gage No. 01092000
Downstream of Outfall 001;
Drainage Area: 3,092 mi^2;
7Q10 low-flow value: 638.652 CFS.

<u>USGS Gages on tributaries between Franklin Jct. and Outfall 001:</u>

Contoocook River below W. Hopkinton Dam; USGS Gage No. 01085500
Drainage Area (DA): 427 mi^2;
7Q10 low-flow value: 38.051 CFS.

Warner River at Davisville; USGS Gage No. 01086000
Drainage Area (DA): 146 mi^2;
7Q10 low-flow value: 5.286 CFS.

Blackwater River near Webster; USGS Gage No. 01087000
Drainage Area (DA): 129 mi^2;
7Q10 low-flow value: 12.807 CFS.

<u>USGS Gages on tributaries between Outfall 001 and Goffs Falls:</u>

Soucook River Pembroke Road near Concord; USGS Gage No. 01089100
Drainage Area (DA): 81.9 mi^2;
7Q10 low-flow value: 6.929 CFS

Suncook River at North Chichester; USGS Gage No. 01089500
Drainage Area (DA): 157 mi^2;
7Q10 low-flow value: 3.968 CFS

Piscataquog River near Goffstown; USGS Gage No. 01091500
Drainage Area (DA): 202 mi^2;
7Q10 low-flow value: 9.84 CFS

The 7Q10 for the intervening drainage area between the upstream and downstream gaging stations (Q_{IDA}) was determined to be 83.946 CFS and the Dingman ratio ($r_{Dingman}$) was determined to be 0.401. By adding the 7Q10 low flow from Franklin Junction to the 7Q10 of the gaged tributaries and the prorated Dingman 7Q10 from the intervening drainage area ($Q_{IDA} \times r_{Dingman}$), the 7Q10 flow just downstream of the plant's Outfall 001 was determined to be 567.67 CFS. The equations used for these calculations are shown below. First, the 7Q10 from the intervening drainage area was calculated for the area between the two gages as follows:

$$Q_{IDA} = Q_{Goffs} - Q_{Frank} - Q_{Goff\text{-}Tribs}$$

where:

Q_{IDA} = 7Q10 flow from intervening drainage area between Franklin Junction and Goffs Falls, in CFS
Q_{Goffs} = 7Q10 flow at Goffs Falls gage, in CFS.
Q_{Frank} = 7Q10 flow at Franklin Junction gage, in CFS.
$Q_{Goff\text{-}Tribs}$ = 7Q10 flow from gaged tributaries between Franklin Junction and Goffs Falls, in CFS

Next, the 7Q10 low flow just downstream of Outfall 001 was calculated as follows:

$$Q_{001} = Q_{IDA} \times r_{Dingman} + Q_{Conc\text{-}Tribs} + Q_{Frank}$$

where:

Q_{001} = Estimated 7Q10 flow just downstream of Outfall 001, in CFS.
Q_{IDA} = 7Q10 flow from intervening drainage area between Franklin Junction and Goffs Falls, in CFS
$r_{Dingman}$ = Ratio of Dingman 7Q10 at Outfall 001 to Dingman 7Q10 at Goffs Falls
$Q_{Conc\text{-}Tribs}$ = 7Q10 flow from gaged tributaries between Franklin Junction and Concord Hall Street WWTF (Outfall 001), in CFS
Q_{Frank} = 7Q10 flow at Franklin Junction gage, in CFS.

DILUTION FACTOR

Equation used to calculate dilution factor at Outfall 001.

$$DilutionFactor = \frac{Q_{001} \times 0.646}{Q_{PDF}} \times 0.9$$

where:

Q_{001} = Estimated 7Q10 low flow of the Merrimack River just downstream of Hall Street Outfall 001, in CFS.
0.90 = Factor to reserve 10 % assimilative capacity
Q_{PDF} = Treatment plant's design flow, in MGD.
0.646 = Factor to convert CFS to MGD.

WATER QUALITY CRITERIA BASED LIMIT

Equation used to calculate average monthly and maximum daily Total Residual Chlorine limits.

Chlorine Limit = Dilution Factor x Water Quality Standard

where water quality standards for chlorine are:
0.011 = Chronic Aquatic-Life Criterion, in mg/L.
0.019 = Acute Aquatic-Life Criterion, in mg/L.

RESPONSE TO COMMENTS – AUGUST 18, 2011
REISSUANCE OF NPDES PERMIT NO. NH0100901
CITY OF CONCORD – HALL STREET WASTEWATER TREATMENT FACILITY
CONCORD, NEW HAMPSHIRE

From March 25, 2011 through April 23, 2011 the U.S. Environmental Protection Agency (EPA-New England) and the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the City of Concord, NH.

EPA-New England and NHDES-WD received comments from the City of Concord (dated April 21, 2011), the City of Manchester (dated April 20, 2011), the New Hampshire Water Pollution Control Association (dated April 18, 2011), the City of Rochester (dated April 22, 2011), the Town of Merrimack (dated April 20, 2011), and Technical Assistance for Pollution Prevention Inc. (dated April 23, 2011). Below is a list of the comments received and EPA-New England's responses to those comments, including any corrections made to the public-noticed permit as a result of those comments.[1]

A copy of the final permit may be obtained by writing or calling Michael Cobb, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, Massachusetts 02109-3912; Telephone (617) 918-1369. Copies may also be obtained from the EPA Region 1 web site at http://www.epa.gov/region1/npdes/index.html.

A. COMMENTS FROM THE CITY OF CONCORD

COMMENT A1:

"The Town of Bow is a contributor of flow into the City of Concord's wastewater collection system. The Town of Bow owns and is responsible for operation and maintenance activities relative to the collection system within its jurisdiction. It should be clear that the City of Concord assumes no responsibility for any associated maintenance, operation, reporting or management requirements associated with the Town of Bow's system.

The City of Concord requests that the following language (consistent with language in NPDES Permit No. NH0100331) be inserted into the Hall Street WWTF permit:

'The Town of Bow is a co-permittee for activities required in Part I.B. (Unauthorized Discharges), Part I.C. (Operation and Maintenance of the Sewer System), and Part I.D. (Alternative Power source). The responsible municipal department is: Bow Board of Selectmen, 10 Grandview Road, Bow, New Hampshire 03304.'"

[1] After EPA issues a final NPDES permit for a New Hampshire point source, the State interprets its water pollution control statute to authorize subsequent adoption of the federal permit as a state surface water discharge permit.

RESPONSE A1:

In May of 2010, the Environmental Appeals Board issued a decision in *In re UpperBlackstone Water Pollution Abatement District*, NPDES Appeal Nos. 08-11, 08-12, 08-13, 08-14, 08-15, 08-16, 08-17, 08-18, 09-06 (EAB May 28, 2010), 14 E.A.D. __. In that decision, the Board remanded the co-permittee requirements of that permit to EPA for further articulation of the statutory, regulatory, and factual bases for expanding the scope of NPDES authority beyond the treatment plant owner and operator to separately owned and operated collection systems. EPA is currently developing an appropriate response to the questions posed by the Board on remand.

As explained in the Fact Sheet, the permit provisions applicable to the Hall Street Wastewater Treatment Facility itself are necessary to properly maintain the treatment plant and collection system to protect water quality in the Merrimack River system and are independent of the co-permittee provisions. In EPA's judgment, the need for expeditious implementation of the permit provisions applicable to the Hall Street Wastewater Treatment Facility counsels against further delay in the issuance of the final permit. Consequently, EPA has elected to issue the final permit to the City of Concord as sole permittee, and to defer further action regarding specific co-permittee requirements applicable to the Town of Bow while EPA conducts a legal, policy and factual assessment of the co-permittee issue. The City of Concord remains responsible for preventing unauthorized discharges from its system, and must ensure that excess inflow and infiltration (regardless of origin) do not cause violations of effluent limitations or other permit requirements. EPA acknowledges that the City of Concord does not have control of or maintenance responsibilities for the portion of the collection system owned by the Town of Bow. (If the City of Concord finds it appropriate to request that the Town of Bow make certain improvements to their collection system in order to facilitate Concord's compliance with permit requirements, the City may refer its concerns directly to that town, pursuant to intermunicipal agreements or other means outside of the NPDES permit itself.)

For these reasons, the final permit does not include references to co-permittees in (i) the Title Page, (ii) paragraph I.B, (iii) paragraph I.C.3, or (iv) paragraph I.C.5. If EPA later determines that it is appropriate to include co-permittee requirements, EPA will take further action at that time according to the procedures of 40 C.F.R. part 124.

COMMENT A2:

"The City of Concord has reviewed the assumptions and calculations relative to the proposed effluent phosphorous limits and requests that EPA withdraw the proposed limit. The basis for this request is supported by the following:

1. The Merrimack River is not identified on the State of New Hampshire's 303(d) list as impaired by nutrients.

2. From the bar graph on page 13 of 34 there are three identified occurrences when the calculated total in-stream phosphorous concentration had the potential to exceed the Gold Book-recommended total phosphorous criteria of 100 ug/l. On the three specific sampling dates that these effluent samples were collected and analyzed, the effluent flow from the Hall Street WWTF was significantly less than the design flow of 10.1 MGD. Applying the actual data to the three noted exceedances yields the following results that clearly indicate no excursion from the recommended Gold Book criteria:

Sample Date	Eff Q MGD	Eff P mg/l	Upstream 7Q10 MGD	Upstream P mg/l	Calculated Downstream Q MGD	Calculated Downstream P mg/l
4/21/08	6.22	3.2	356.8	0.024	363.02	0.078
10/20/08	2.89	4.1	356.8	0.024	359.69	0.057
4/20/09	5.42	3.0	356.8	0.024	362.22	0.069

3. The calculation utilized to develop the proposed phosphorous limit is overly conservative, as peak WWTF flows would not occur at the same time as the receiving water 7Q10. Monthly average WWTF effluent flows have only once during the period July 2005 through June 2010 reached or exceeded the design flow of 10.1 MGD. The singular exception was related to the Mothers Day flood event in May 2006. During this period the Merrimack River flow greatly exceeded the 7Q10 utilized in the calculation."

RESPONSE A2:

1. For discussion related to the 303(d) list and impairment of the Merrimack River, see response C1 below.

2. The regulatory requirement for determining the need for a water quality based permit limit is not predicated on demonstrating an actual impairment but rather on demonstrating that there is a reasonable potential that the discharge might cause or contribute to an impairment. Given this preventative focus of the Clean Water Act, it is appropriate to utilize conservative assumptions in making the reasonable potential determination. Similarly, it is appropriate to utilize conservative assumptions in establishing the limit, given the regulatory requirement to ensure that the limit will not result in the discharge causing or contributing to a water quality standards impairment. The phosphorus limit is based on a number of conservative and non-conservative assumptions relating to the upstream concentration of phosphorus, the available dilution, and the appropriate averaging period for the limit. While the use of the design flow is a conservative assumption, it would not be appropriate to eliminate one conservative assumption

without consideration of the balance of all assumptions included in the permit limit calculation. It clearly would not be protective to utilize current flows in the permit limit calculation since flows typically increase over the life of the permit due to the growth of communities.

In addition, the US Army Corps of Engineers conducted a recent study[2] on the Upper Merrimack River and Pemigewasset River, which was published in January of 2011. This study monitored many parameters which characterize water quality along a 120 mile stretch of the Merrimack River upstream and downstream of the Concord - Hall Street facility. A significant increase in chlorophyll-a concentration was observed in the vicinity of the Hall Street outfall and continued to rise downstream of the outfall. An increase in chlorophyll-a concentrations is one of the clearest indicators of cultural eutrophication. While this chlorophyll-a response was evident under river flow conditions that were approximately 2.5 times the 7Q10 flow, it would be expected to be significantly greater under 7Q10 flow conditions.

In light of the concerning levels of indicators of eutrophication and water quality impairments (dissolved oxygen and dissolved oxygen saturation) both upstream and downstream of the Hall Street outfall, EPA does not agree that removing one of the conservative assumptions is appropriate in the derivation of the phosphorus limit. Given that the Gold Book criteria is a "not to be exceeded" value and given that there is an impoundment approximately 2 miles downstream where the Gold Book recommendation is 25 - 50 ug/l, a conservative approach to establishing the permit limit is appropriate. Accordingly, EPA used the design flow of the treatment facility in calculating the total phosphorus limit in the final permit.

3. Use of the 7Q10 receiving water flow is consistent with New Hampshire's water quality standards. *See* Env-Ws 1705.02(a) and (d). We understand that receiving water flows are not typically at 7Q10. The water quality standards requirement that EPA conservatively assume critical low flow conditions when calculating permit limits is designed to ensure water quality criteria exceedances remain very infrequent (thus enhancing the goal of achieving uses). In addition, the design flow of the treatment facility was used for reasons described in the comment above. As mentioned, it clearly would not be protective to utilize current flows in the permit limit calculation since flows typically increase over the life of the permit due to the growth of communities.

COMMENT A3:

[2] *Upper Merrimack and Pemigewasset River Study* by the U.S. Army Corps of Engineers, January 2011 (prepared by CDM) ftp://ftp.usace.army.mil/pub/nae/UMRB-REPORT-JAN2011/UMPRS_Year1%20Data%20Report%20Appendix_Jan2011.pdf

"Despite the City's stated objections to the proposed phosphorous limit, should EPA decide that a phosphorous limit must be imposed the City of Concord requests that EPA revise the phosphorous concentration limit in the permit and replace with a mass-based limit of 199 pounds per day. An appropriate mass-based limit achieves the same objective as the proposed concentration limit and also provides relief to the City of Concord when WWTF effluent flows are below the design flow of 10.1 MGD. The table below illustrates the allowable phosphorous concentrations at different effluent flows while still meeting the recommended in-stream phosphorous limit of 100 ug/l. The calculations have accounted for the 10% assimilative capacity reserve factor. It must be noted that mass-based limits for nutrients is not a new concept and has been applied to other NPDES permits in Region 1."

Plant Eff Q Monthly Avg (MGD)	Plant Eff Q Monthly Avg (cfs)	Upstream 7Q10 (cfs)	Upstream P Background (mg/l)	Downstream 7Q10 (cfs)	Downstream P Gold Book Criteria (mg/1)	Reserve Factor	Required Eff P Mass Limit (lbs/day)	Requested Eff P Mass Limit (Ibs/day)	Calculated Eff P (mg/l)	Calculated Downstream P (mg/l)
10.1	15.63	552.04	0.024	567.67	0.1	0.9	204	199	2.36	0.10
9	13.93	552.04	0.024	565.97	0.1	0.9	203	199	2.65	0.10
8	12.38	552.04	0.024	564.42	0.1	0.9	202	199	2.98	0.10
7	10.83	552.04	0.024	562.87	0.1	0.9	202	199	3.41	0.10
6	9.28	552.04	0.024	561.32	0.1	0.9	201	199	3.98	0.10
5	7.74	552.04	0.024	559.78	0.1	0.9	200	199	4.77	0.10
4	6.19	552.04	0.024	558.23	0.1	0.9	199	199	5.97	0.10
3	4.64	552.04	0.024	556.68	0.1	0.9	199	199	7.95	0.10

RESPONSE A3:

A mass-only limit provides advantages to the City, because when WWTF flows are low, the concentration of phosphorus in the effluent can be higher. For example, when the WWTF flow is at 3 mgd the concentration in the effluent to achieve 199 lb/d is 7.95 mg/l (199 lb/day/(8.34)(3 mgd)). However, if the facility was to discharge at the design flow of 10.1 mgd, the concentration in order to achieve 199 lb/d is 2.36 mg/l (199 lb/day/(8.34)(10.1 mgd)), which is actually more stringent than the draft permit's concentration-based limit. At the same time, the mass-only phosphorus limit ensures protection of water quality standards because it has been calculated to ensure that the total in-stream phosphorus loading does not exceed a value (199 lb/d) that has been calculated to meet in-stream concentration target of 0.1 mg/l based on 7Q10 flow.

EPA agrees with the City that a mass-only limit for phosphorus will maintain the instream target of 0.1 mg/l total phosphorus concentrations in the Merrimack River and will include only a mass-based limit of 199 lb/d in the final permit.

Although EPA has determined at this time that the mass-only limit is appropriate in this case, it should be noted that in the future, as NHDES develops numeric nutrient criteria,

or if conditions in the Merrimack River dictate, it may be necessary to modify or reissue the permit to incorporate effluent concentration limits for phosphorus.

COMMENT A4:

"Further, should EPA decide to impose a phosphorous limit, The City of Concord requests that any phosphorous limit be only for the period April 1st through October 31st, the period during which eutrophic conditions are most likely to occur and during which phosphorous effluent loading is most detrimental to water quality goals. As the predominant form of phosphorous in treated wastewater effluents is in the dissolved fraction, and plant growth does not occur during the winter season to absorb it, it will likely remain dissolved and flow out of the system. For these reasons a phosphorous effluent limit is not necessary to protect water quality and water uses during the winter.

RESPONSE A4:

EPA agrees with the comment that the vast majority of the phosphorus discharged will be in the dissolved fraction and that dissolved phosphorus will pass through the system during the winter period. For this reason, the phosphorus limit will only be in effect for the period April 1st through October 31st.

B. COMMENTS FROM THE CITY OF MANCHESTER

COMMENT B1:

"The City of Manchester, NH is commenting on Concord, New Hampshire's draft NPDES permit, No. NH0100901. Manchester's area of concern is the proposed phosphorus limit and the narrative associated with the proposed limit.

Page 9 of 34, item 3 of the Fact Sheet, begins the Phosphorus narrative. The last paragraph of page 10 of 34 states, "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring. 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." The NHDES states that 0.05 mg/l (50 ug/1) is considered a level of concern. The 1986 Quality Criteria of Water (Gold Book) recommends instream phosphorus concentrations of 0.1 mg/l (100 ug/1) for any stream not discharging directly to lakes or impoundments.

The following page (11 of 34) outlines the list of 303d impairments such as aluminum, dissolved oxygen saturation, dissolved oxygen and pH. There is no phosphorus impairment within the Merrimack River in New Hampshire.

The NHDES provides a plot on page 12 of 34 outlining ambient River monitoring just upstream of the Hall Street WWTF of 57 data points between 1990 and 2008. The plot

demonstrates the highest reading is 44 ug/l with the mean of all samples taken being 24 ug/l. All tests are below the NHDES numerical value (50 ug/1) of concern and less than 1/2 of the Gold Book criteria.

The plot has a notation that states "It should be noted that these data were primarily taken between June and August of each year. These months are typically dry months (compare to USGS stream monitoring data) which represent the season when low flow conditions and phosphorus concentrations may present the most water quality concerns."

There is a bar graph on page 13 of 34 that illustrates a calculated total in-stream phosphorus concentration that demonstrates the 100 ug/l instream concentration was exceeded in June of 2008, December of 2008 and June of 2009. Note the Qs parameter is the "stream flow in mgd or cfs upstream (7Q10 downstream - design flow) which the "Available Dilution" narrative on page 9 of 34 states is 567.7 cfs.

Attached as Exhibit 1 is Manchester's Bypass Flow for June 2008. This data indicates that there were substantial rain events during June of 2008 and June of 2008 was not a typical "Dry Month." As it was very difficult for the Army Corps to collect a dry weather sampling event during 2008, it is expected that the Merrimack flow in cfs was several times greater than the 7Q 10 on the day that bar graph was created.

Exhibit 2 includes Manchester's Bypass flow for December 2008. This was an extremely rainy month with the Merrimack's 7Q10 being several orders of magnitude over the Qs parameter used in the NHDES calculation.

Exhibit 3 includes Manchester's Bypass flow for June of 2009. This was a wetter month than June of 2008. The rationale of "Typical Dry Month" would not hold in any of the three cases cited by the NHDES in the Concord WWTF Outfall 001 graph.

The City of Manchester is requesting that the mass balance equation use the actual river cfs at the time of sampling rather than the theoretical 7Q10 for parameter Qs. It would also be appropriate to use the average cfs river flow for the month stated. The whole bar graph should be reflective of real world conditions and the true instream phosphorus concentration rather than a calculated value using the 7Q10 value.

Manchester is concerned that this precedent of setting a numerical limit in an ultraconservative manner will be within our next permit when it is issued. With a 7Q10 dilution of 11.81 to 1 and a 10% Assimilative Capacity Reserve, Manchester will be given a 1.06 mg/l limit for phosphorus. This, as in Concord's case, will be a limit required when there has not proven to be a 303d impairment for phosphorus.

Concord's permit should remain monitor only for the time being until the Army Corps nutrient study is completed and a TMDL can be set along the Merrimack River. This will assure a scientific based limit rather than an ultra conservative theoretical limit as currently proposed."

Note: Exhibits 1, 2 and 3 are not reproduced here, but were considered in the following response.

RESPONSE B1:

The Gold Book values are recommended as "not to be exceeded" values and thus are appropriately applied at a low flow such as 7Q10. *See* Gold Book at 240 ("To prevent the development of biological nuisances and to control accelerated or cultural euthrophication, total phosphates and phosphorus (P) *should not exceed* 50 µg/L in any stream at the point where it enters any lake or reservoir, nor 25 µg/L within the lake or reservoir. A desired goal for the prevention of plant nuisances in streams or other flowing waters not discharging directly to lakes or impoundments is 100 µg/L total P.") (emphasis added); *cf. In re City of Attleboro, Massachusetts Wastewater Treatment Plant* ("*Attleboro*"), NPDES Appeal No. 08-08, 14 E.A.D. ___, slip op. at 61-64 (EAB, Sept. 15, 2009).

The use of averaging periods longer than the 7Q10 period may be appropriate where the target criterion used is based on longer term average conditions. In this case, however, the criterion used (100 ug/l) is not an average criterion but rather a "not to be exceeded" criterion. EPA's ecoregion criterion is an example of a longer term average criterion (10 ug/l) that would be appropriately applied during average conditions. Use of the 7Q10 flow in combination with the "not to be exceeded" Gold Book criterion does not generate an overly conservative effluent limit.

Use of the 7Q10 receiving water flow is also consistent with New Hampshire's water quality standards. *See* Env-Ws 1705.02(a) and (d). Such an assumption will not necessarily reflect actual flow conditions—which may be more or less than the 7Q10 on any given day—nor is it intended to. The requirement that EPA conservatively assume critical low flow conditions when calculating permit limits is designed to ensure water quality criteria exceedances remain very infrequent (thus enhancing the goal of achieving uses).

Furthermore, the statement in the draft permit, which was repeated in this comment, that the upstream phosphorus "data were primarily taken between June and August" which are "typically dry months", is simply intended to characterize the data, not as a rationale for why these data were used.

Finally, as discussed in Comment A2 above, the Army Corps of Engineers published a study of the Merrimack River in January 2011, which demonstrated evidence of cultural eutrophication. There is no need to wait for a TMDL to be set before setting nutrient limits to protect designated uses of the receiving water.

C. COMMENTS FROM THE NEW HAMPSHIRE WATER POLLUTION CONTROL ASSOCIATION (NHWPCA)

COMMENT C0:

"Of central concern is the proposed permit's inclusion of a phosphorus limitation for a facility that discharges to waters never having been identified to be nutrient impaired. This limitation was based upon the unsupported assumption that flowing waters may not exceed 0.1 mg/L total phosphorus under the rarely occurring 7Q10 flow condition. As the Association understands it, the Region included this limitation in an attempt to interpret and implement the state's narrative criteria with respect to phosphorus. The pertinent part of this standard reads as follows:

> Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring... 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.

Env-WS 1703.14. At a minimum, this narrative standard requires that there be a demonstration that the discharge is causing impairment. In issuing the draft permit, however, the Region has made three very important presumptions that have the potential to impact a number of treatment facilities: first, the Merrimack River is impaired by nutrients; second, the applicable numeric criteria should be the 0.1 mg/L suggested as a possible objective in the 1986 Quality Criteria of Water ("Gold Book"), and; three, the Hall Street WWTF is causing or contributing to an excursion above the assigned instream phosphorus criteria. Based on these decisions and the revised dilution ratio, EPA proposed an end-of-pipe limit of 2.42 mg/L. As explained below, the Association has several significant objections with the assumptions and determinations made by the Region in developing this limit.

RESPONSE C0:

See comments and responses C1, C2, C3, and C4 below.

COMMENT C1:

A. The State has never listed the waterbody at issue as nutrient impaired

Under section 303(d) of the Clean Water Act, New Hampshire is given primary authority for identifying which of its waterbodies are not meeting the governing water quality standards and for what reasons. EPA has limited authority (inapplicable in this instance) to intrude into this State responsibility. With regard to Merrimack River, New Hampshire has never identified the waterbody as nutrient impaired on the State's 303(d) list.[3] Moreover, Region 1 specifically approved New Hampshire's decision not to list the

[3] As mentioned in the draft permit, stretches of the Merrimack River are identified as impaired by aluminum, dissolved oxygen, pH, and *Escherichia coli*. Unlike numerous other waterbodies in New Hampshire, chlorophyll-a (surrogate for plant growth) is not the basis of impairment.

waterbody as nutrient impaired, indicating that the current instream conditions and loadings are acceptable. If EPA wishes to amend a State's 303(d) listing decision, there is a specific process for doing so. Until such steps are taken, however, EPA has no authority to presume nutrients are impairing Merrimack River or assert that a narrative criteria violation related to nutrients exists in this waterbody."

RESPONSE C1:

When reissuing an NPDES permit, EPA is obligated as a matter of statute and regulation to include any water quality-based effluent limitations necessary to ensure compliance with applicable water quality standards. *See* CWA § 301(b)(1)(C); 40 CFR § 122.44(d)(1), (5) (requiring EPA to incorporate "any more stringent limitation, treatment standards, or schedule of compliance requirements established under Federal or State law or regulations in accordance with" Section 301(b)(1)(C)); 40 CFR § 122.4(d) (prohibiting permit issuance where "the imposition of conditions cannot ensure compliance with water quality requirements of all affected states"). Thus, upon establishing that there was a reasonable potential for phosphorus concentrations in the Hall Street WWTF's effluent to cause or contribute to a violation of water quality criteria, EPA was compelled to include a phosphorus effluent limit sufficiently stringent to ensure compliance with standards. *See* 40 CFR § 122.44(d)(1)(iii). This limit must be imposed whether or not the Merrimack River is designated as impaired for phosphorus on the 303(d) list.

COMMENT C2:

"B. The State's narrative criteria clearly requires a demonstration that nutrients are responsible for harm

Although the narrative criteria does not precisely define a numeric phosphorus concentration at which the water is deemed to be impaired, it does provide some framework for making this decision. Specifically, the regulation includes the phrases "in such concentrations that would impair" and "which encourage cultural eutrophication." This language represents the causal requirement that a permit writer must demonstrate exists before concluding that a waterbody in New Hampshire is impaired by phosphorus. However, the Region made no attempt to adhere to this "causal demonstration" requirement and, instead, merely assumed that phosphorus was causing an impairment because the instream concentrations exceeded the value contained in EPA's 'Gold Book.'"

RESPONSE C2:

Contrary to the commenter's understanding, EPA does not have to adhere to a "causal demonstration" requirement in order to impose the phosphorus limit, but only that

phosphorus effluent discharges from the facility have the reasonable potential to cause or contribute to a violation of applicable water quality standards.[4]

Pursuant to Env-Ws 1703.14(c), discharges that encourage eutrophication require treatment necessary to ensure compliance with water quality standards. It should be further noted that NH Standards define cultural eutrophication in terms of excessive plant growth and/or dissolved oxygen. *See* NHDES Env-Ws 1702.15. As indicated in the Fact Sheet, the Merrimack River (just upstream of the Hall Street WWTF discharge) is listed on the 303(d) list as impaired for both dissolved oxygen saturation and dissolved oxygen, which has a direct adverse impact on aquatic life uses.

As noted in the Fact Sheet and above, a target ambient phosphorus concentration of 0.1 mg/l is within the range of recommended phosphorus concentrations (0.010 mg/l to 0.10 mg/l) contained in the record and thought to be sufficiently stringent to prevent cultural eutrophication. The Region opted for a limit that would achieve the Gold Book recommended concentration of 0.1 mg/l rather than the more stringent effects-based values (0.03 mg/t to 0.09 mg/l) and reference-based values (0.01 mg/l) cited in the record for the reasons discussed in the Fact Sheet (at pp. 10-11).

COMMENT C3:

"C. The Region is applying the Gold Book standard as if it is a numeric criterion for the entire state

As described above, EPA simply assumed that the Gold Book's 0.1 mg/L preliminary recommendation for phosphorus was the applicable instream target for the Merrimack River without using any site-specific data to confirm (1) the existence of a nutrient impairment or (2) whether such a criterion is necessary to protect the applicable uses. In so doing, EPA has effectively adopted a numeric criterion for all similar-situated waters in the state (i.e., free-flowing without a direct link to a lake or reservoir). Moreover, in this case, EPA has effectively concluded that 0.1 mg/1 TP limit should be applied to all flowing waters without considering any of the relevant physical factors or whether the nutrient level is actually causing any use impairment. Such EPA action is both procedurally and substantively improper. First, States have primary authority to amend existing water quality standards and all amendments (state or federal) must be subjected to a public notice and comment process. For other states where EPA has determined that a numeric criterion was the applicable translator for a state's narrative standard, EPA has undergone notice and comment rulemaking. This is required by 40 C.F.R. §§ 131.21 and 22. EPA's recent nutrient criteria adoption action in Florida was an example of such agency decision-making. Second, the Gold Book does not recommend that a 0.1 mg/L TP nutrient level be established for streams. Rather, the Gold Book expressly qualifies its recommendation for nutrients because of the dynamic interplay nutrients have with

[4] It is worthwhile recalling that the test for triggering phosphorus removal standard at Env-Ws 1703.14(c) is whether the discharge "encourages cultural eutrophication," not whether the discharge is the primary cause.

individual ecosystems and the range of potentially appropriate nutrient levels given varied site-specific conditions.[5] Thus, the Region has also not properly applied the recommended approach specified in the 'Gold Book.'"

RESPONSE C3:

The commenter suggests that the Region has equated the *Quality Criteria for Water 1986* ("Gold Book") value of 0.1 mg/l with the state water quality criterion for nutrients. It has not. In the course of determining the trophic status of the receiving waters and deriving a protective phosphorus effluent limit that would meet the narrative phosphorus criterion, the Region looked to a variety of sources, including the Gold Book, the *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria* ("Ecoregional Nutrient Criteria") and the *Nutrient Criteria Technical Guidance Manual: Rivers and Streams* (EPA 2000) ("Nutrient Criteria Technical Guidance Manual"). These constitute information published under CWA § 304(a). The Region explained in the Fact Sheet that it used Section 304(a) information and recommended criteria as *guidance* to interpret the State's narrative criterion for nutrients and not as substitutes for state water quality criteria. The Region's use of the Gold Book and other relevant materials published under Section 304(a) to develop a numeric phosphorus limit sufficiently stringent to achieve the narrative nutrient criterion is consistent with applicable NPDES regulations. When deriving a numeric limit to implement a narrative water quality criterion, EPA is authorized to:

> Establish effluent limits on a case-by-case basis, using EPA's water quality criteria, published under Section 304(a) of the CWA, supplemented where necessary by other relevant information.

40 CFR § 122.44(d)(1)(vi)(B). While the various recommended values for phosphorus contained in the materials cited above—*e.g.* 0.01 mg/l (*Ecoregional Nutrient Criteria*) to 0.1 mg/l (*Gold Book*)—were not specifically designed to meet New Hampshire's water quality standards in particular, these values do reflect a range of ambient phosphorus concentrations that are sufficiently low to prevent cultural eutrophication.[6] The Region's

[5] Quality Criteria of Water (Gold Book) EPA 440/5-86-001 (May 1, 1986) (Recognizing that instream phosphorus levels "do not directly impact streams and rivers" and that "a number of specific exceptions can occur to reduce the threat of phosphorus"). Furthermore, EPA's document entitled "National Recommended Water Quality Criteria - Correction" (USEPA April 1999) specifies that no numeric recommendation has been proposed for phosphorus - only a "narrative statement" applies. This narrative statement requires consideration of site-specific information on whether or not the nutrient level is actually causing excessive plant growth and impairment of uses.

[6] For example, the Gold Book states:

> Algal growths impart undesirable tastes and odors to water, interfere with water treatment, become aesthetically unpleasant, and alter the chemistry of the water supply. They contribute to the phenomenon of cultural eutrophication.

decision to opt for an in-stream phosphorus target approximating the Gold Book value rather than the ecoregional criterion is discussed in the Fact Sheet.

COMMENT C4:

"D. Nutrient limits should not be applied based on a 7/Q/10 analysis

The phosphorus limit proposed in the Hall Street permit was based and developed upon the calculated 7Q10 flow. However, nutrients are not toxics and their impacts are manifested over a growing season. Thus, it is well-settled that nutrient concerns for streams and rivers, to the extent they exist at all, are only a concern during the growing season (e.g. April - September) with the 7Q10 flow typically occurring in the fall. During the April to September period, snow melt and wet weather result in stream flows typically far greater than 7Q10. As a result, the proposed limit was developed using a non-representative flow and is, consequently, unnecessarily stringent.

RESPONSE C4:

See response to comment B1 above related to the use of the 7Q10 flow.

COMMENT C5

Based on the following comments, it is respectfully requested that the Region withdraw the phosphorus limit from the Hall Street draft permit. Under New Hampshire law, a narrative criteria violation requires demonstration that a waterbody is being impaired by nutrients. No such analysis has ever been conducted on the Merrimack River by the state or EPA. To impose a phosphorus limit, the Region must demonstrate that nutrients are, in fact, causing impairments in the Merrimack River and develop an instream phosphorus target based on the site-specific data used in that determination. Moreover, it is inappropriate to presume that a 0.1 mg/L TP level is required to protect all flowing waters from nutrient impacts. It is also scientifically inappropriate to base the proposed limit on the rarely occurring 7Q10 flow that does not control the degree of plant growth occurring in the river. Given the fundamental flaws embedded in the Region's approach to interpreting the state's narrative standard and setting phosphorus limits, the draft provision should be withdrawn.

RESPONSE C5:

See responses to comments C1, C2, C3, and C4 above.

To prevent the development of biological nuisances and to control accelerated or cultural eutrophication, total phosphates as phosphorus (P) should not exceed 50 ug/l in any stream at the point where it enters any lake or reservoir, nor 25 ug/l within any lake or reservoir. A desired goal for the prevention of plant nuisances in streams or other flowing waters not discharging directly to lakes or impoundments is 100 ug/l total P. (Mackenthun, 1973) (p. 240).

D. COMMENTS FROM THE CITY OF ROCHESTER

Note: Comments D0, D1, D2 and D3 from the City of Rochester were repetitions of Comments C0, C1, C2 and C3 from the NHWPCA. See responses above.

COMMENT D4:

"EPA's November 2001 Nutrient Policy Document directed states to develop nutrient criteria plans using one of three approaches: (1) develop nutrient criteria that reflect localized conditions and protect specific designated uses using the process outlined in technical guidance manuals; (2) adopt EPA's recommended numeric criteria or (3) use other scientifically-defensible methods to develop criteria protective of designated uses. At various points in the document, EPA underscored that the fundamental purpose of nutrient criteria is to protect designated uses. See Policy Document at p. 4 ("EPA expects states ... to describe a systematic approach ... to assess the ... need for nutrient criteria to protect designated uses."); Policy Document at p. 5 ("States ... establish criteria for the specific purpose of protecting the designated uses of their waters.") In fact, EPA recognized that its "Gold Book" recommendation constituted an "attempt to characterize reference conditions on a broad ecoregion or sub-ecoregion scale irrespective of designated uses ... or levels of refinement within the same type of designated use . . . ." Id. at p. 5. Thus, EPA's Gold Book criteria, upon which EPA ultimately based its proposed permit limit, is not related to the protection of designated uses in New Hampshire Class B streams.

Shortly after EPA published its nutrient policy document, the State of New Hampshire issued its "Plan for Adoption of Nutrient Water Quality Criteria", attached hereto. New Hampshire elected to "develop its own scientifically-defensible approach", stating that EPA's recommended statistical approach did not "relate directly to use support." Significantly, New Hampshire's policy states that, "based on ... reports and professional experience, we believe that there are not many New Hampshire waterbodies for which water quality does not support designated or existing uses (primarily aquatic life and swimming) due to cultural nutrient enrichment." See New Hampshire Plan at p. 1. New Hampshire "proposed to set numeric limits by waterbody type only for chlorophyll a because that is the parameter that (in almost all cases) actually results in non-attainment of a designated use due to cultural nutrient enrichment, either aquatic life use support or recreation." See New Hampshire Plan at p. 2.

RESPONSE D4:

As explained in the fact sheet, the Region opted to base the phosphorus limit on the Gold Book approach rather than the reference condition-based ecoregional approach. *See* Fact Sheet at 10-11. The Permittee's quotation from EPA's November 14, 2001 Memorandum titled "Development and Adoption of Nutrient Criteria into Water Quality Standards" relates to the reference conditions-based approach, not the approach that the Region actually took in establishing the phosphorus limit. With that said, the elided

quote regarding "reference conditions…irrespective of designated uses" from EPA's 2001 Memorandum has been stripped of its proper context. The sentence from the memorandum following the one quoted by the commenter clarifies:

> EPA considers these 304(a) criteria recommendations to be protective against the adverse effects of excessive nutrient enrichment in these ecoregions for *all assigned designated uses* [emphasis added], in the absence of information to the contrary… If reference conditions accurately reflect minimally disturbed conditions, then all attainable uses should be protected if water quality is equal to or better than the reference conditions.

EPA Nutrient Criteria Memorandum at 4. The reference condition approach would be expected to protect New Hampshire's designated uses, which is a variant on the commonly used fishable/swimmable formulation and certainly within the range of uses addressed by ecoregional guidance ("The waters of this classification shall be considered as being acceptable for fishing, swimming and other recreational purposes and, after adequate treatment, for use as water supplies."). Likewise, the Gold Book approach, which recommends a value of 0.1 mg/l, is designed "to prevent the development of biological nuisances and to control accelerated or cultural eutrophication[.]"

All states, including New Hampshire, are in the process of developing numeric nutrient criteria that, at a minimum, will protect all designated uses. As noted, NHDES has not adopted numeric nutrient criteria. Its Nutrient Policy Document remains in draft form and has not been approved by EPA. Water column chlorophyll *a* levels are an indicator of phytoplankton biomass, which would be expected to be higher in stream segments with low current velocity, long detention time, low turbidity/color, open canopy, greater depth, and greater depth to width ratio. *Nutrient Criteria Technical Guidance Manual*, Table 1, at 21. However, it is not adequate as the *only* indicator of eutrophication to document the full extent of nutrient related impacts in most rivers/streams, because stream segments with high current velocity, low turbidity/color, open canopy, shallow stream depth, minimal scouring, limited macroinvertebrate grazing, gravel or larger substrata, and smaller depth to width ratio would be expected to have a high periphyton biomass, which is not measured by water column chlorophyll *a.* For instance, in river reaches where macrophytes and/or periphyton dominate, these indicators of eutrophication also need to be considered in the development of numeric criteria. Also, any criteria that is based on a response variable such as chlorophyll *a* must also include a mechanism for establishing limits on the causal variable (*i.e.* phosphorus) that will result in attainment of the criteria.

COMMENT D5:

Accordingly, EPA must do more than conclude that phosphorus constitutes a "threat" of cultural eutrophication before imposing a phosphorus limit. Rather, EPA must point to

specific data establishing that Class B uses are not being met in the river due to the presence of phosphorus. This EPA has not done. The State of New Hampshire has made clear that it believes that few New Hampshire waterbodies are not meeting designated or existing uses due to cultural nutrient enrichment. EPA has neither rebutted this statement nor made a case that such uses are not being met in the Merrimack River due to the presence of nutrients.

RESPONSE D5:

The Region does not need to rebut the NHDES's view in its draft policy concerning the overall number of nutrient impaired waters prior to imposing a phosphorus limit. Even if the Region agreed with NHDES's assessment, the question would still remain whether the Merrimack River is among those few impaired waterbodies. Neither does EPA have to prove that the waterbody is already impaired. As described previously, our regulations require us to impose a limit where there is the reasonable potential for the discharge to cause or contribute to an exceedance of water quality standards. As a practical matter, it makes no sense to interpret the regulations to mean that a limit may only be imposed after the discharge has caused or contributed to a water quality violation.

COMMENT D6:

Based on the following comments, it is respectfully requested that the Region withdraw the phosphorus limit from the Concord draft permit. To impose a phosphorus limit, the Region must demonstrate that nutrients are, in fact, causing impairments in the Merrimack River and develop an instream phosphorus target based on the site-specific data used in that determination. Moreover, it is inappropriate to presume that a 0.1 mg/L TP level is required to protect all flowing waters from nutrient impacts. Given the fundamental flaws in the Region's approach to interpreting the state's narrative standard and setting phosphorus limits, the draft provision should be withdrawn."

RESPONSE D6:

See responses to comments C1, C2, C3, D4 and D5.

E. COMMENTS FROM THE TOWN OF MERRIMACK

COMMENT E1:

"The Town of Merrimack is in full support of the positions stated in the letters from the New Hampshire Water Pollution Control Association and the New England Interstate Water Pollution Control Commission. In general, these letters comment on the Concord Hall Street draft NPDES and related nutrient issue.

The positions stated in these letters emphasis that the EPA needs to be attentive to the implications that are unfolding regarding setting nutrient limits, without an impairment identified or the river assessment units listed on the State's 303(d) list.

We wish to supplement these letters with our specific issues as it relates to a phosphorus limit based on ambient water quality limits of 100 micrograms per liter.

- The State of New Hampshire has not listed the Merrimack River as an impaired river nor has there been demonstrated water quality violations listed near the Town of Merrimack's NPDES permitted outfall.
- Site specific data should be used when setting a limit

We ask you take these comments into consideration when deciding on a nutrient limit in the Concord Hall Street NPDES permit as it will eventually impact your decisions on the Town of Merrimack's NPDES permit."

RESPONSE E1:

For responses to the letter from NHWPCA, see responses C0 through C5 above. EPA did not receive comments from the New England Interstate Water Pollution Control Commission.

The decision to include a phosphorus limit in the Hall Street WWTF draft permit was not dependent upon the Merrimack River being listed as impaired for nutrients. See response C1 above for a more detailed discussion regarding reasonable potential and compliance with applicable water quality standards.

In setting the phosphorus limit, site specific data was used for effluent phosphorus concentration, background in-stream phosphorus concentration and flow (receiving water 7Q10 and plant design flow). Other site specific stream flow data was not used for reasons described in response B1 above.

These comments have been noted and will be considered in relation to the Town of Merrimack's NPDES permit in the future.

F. COMMENTS FROM TECHNICAL ASSISTANCE FOR POLLUTION PREVENTION INC.

COMMENT F1:

"The current draft is much improved compared to the 2004 version; however the overall impact of mercury and arsenic on the environment is still being ignored. A major opportunity to measure the toxics before and after wastewater treatment plant analysis in situ is being missed, especially when more attention is being paid to mass air transport into the New England region. I stand by my comments on the need for WWTPs to

measure these toxics during routine operations and identify them to EPA and NHDES on a continuing basis; see my 19 November 2004 comments on the 2004 draft NPDES for Concord, NH (attached)."

Note: The comments referred to from 19 November 2004 are not duplicated here. The response below addresses the concern "for WWTPs to measure these toxics during routine operations and identify them to EPA and NHDES on a continuing basis" as it applies to the current permit reissuance. The 2004 comments and EPA's responses can be found online at http://www.epa.gov/region1/npdes/permits/nh0100901permit.pdf or hard copies may be requested.

RESPONSE F1:

All of the New England states have issued state-wide advisories concerning the consumption of fish due to bioconcentration of mercury in fish tissue. In response to this water quality problem, a regional TMDL was prepared that outlines steps to be taken by each state to reduce mercury levels in surface waters throughout each state. EPA approved the Northeast Regional Mercury TMDL on December 20, 2007. This TMDL addressed mercury emissions in the states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The TMDL identifies atmospheric deposition as the major source of mercury loading to the region's waters. According to Section 7.5 of the TMDL, the existing point source load from wastewater treatment plants for the entire region is 2.1% of the total source load for mercury. This percentage is small and is expected to further decline based on enacted mercury products legislation and increasing required use of dental amalgam separators throughout the region. According to EPA's Draft Guidance for Implementing the January 2001 Methyl mercury Water Quality Criterion, point source discharges are considered insignificant if the loading or cumulative loading of all point sources to the receiving water are expected to account for a small or negligible portion of the total mercury loadings (U.S. EPA 2006a).

New Hampshire's 2008 List of Threatened or Impaired Water that Require a TMDL (the Section 303(d) list) does not list stretches of the Merrimack River downstream of the Concord WWTF as being impaired due to mercury (for uses other than fish consumption) or for arsenic.

In response to this comment EPA contacted the Concord WWTF for mercury and arsenic monitoring results, which the facility has been doing itself on an annual basis. Results since February 2007 are presented below.

Concord WWTF Arsenic and Mercury Effluent Concentrations				
Date	**Arsenic**	**Mercury**	**Arsenic RDL**	**Mercury RDL**
	mg/l	**mg/l**	**mg/l**	**mg/l**
2/28/2007	0.001	ND	0.001	0.0001
2/27/2008	0.001	ND	0.001	0.0001
2/25/2009	0.002	ND	0.001	0.0001
2/24/2010	0.001	ND	0.001	0.0001
2/2/2011	0.003	ND	0.001	0.0001

* ND = Non Detection
** RDL = Reliable Detection Limit

To determine whether the effluent data supported the need for effluent limitations for these pollutants or for the need to collect additional data, EPA reviewed the water quality criteria for each pollutant and calculated effluent limitations that would be required to maintain an instream concentration of the pollutant less than the water quality criteria. For both arsenic and mercury, the human health criteria used were based upon fish consumption only. Criteria based upon fish and water consumption were not used due to the significant distance (greater than 20 miles) downstream before the nearest active drinking water intake. Please note that a maximum contaminant level (MCL) of 10 ug/l (total recoverable arsenic) for drinking water consumption has been established by EPA pursuant to the Safe Drinking Water Act. This MCL is considerably higher than the criteria applied below, indicating that the criteria are protective of downstream drinking water sources. Also note that because the human health criteria for arsenic and mercury are based on carcinogenic effects, the dilution factor used in the calculations is based on the harmonic mean stream flow, rather than the 7Q10 flow (see Env-Wq 1705.02(d)).

	Arsenic	**Mercury**
Aquatic Life Chronic Criteria	0.15 mg/l	0.00077 mg/l
Dilution factor	32.7	32.7
Aquatic Life Chronic Limits	4.91 mg/l	0.025 mg/l
Human Health Chronic Criteria	0.14 ug/l (0.00014 mg/l)	0.051 ug/l (0.000051 mg/l)
Dilution Factor	111.6	32.7
Human Health Chronic Limits	15.6 ug/l (0.0156 mg/l)	1.668 ug/l (0.001668 mg/l)

Comparing the calculated limits with the effluent monitoring data, it is clear that effluent concentrations of arsenic and mercury are consistently less than the calculated limits. It should be noted that the criteria are based on the inorganic form of arsenic and the monitoring data is for total recoverable arsenic. The direct comparison of the calculated limits with the monitoring data assumes that all of the total recoverable arsenic measured in the effluent samples is in the inorganic form. This is a very conservative assumption.

Based upon this analysis, EPA has determined that there is no reasonable potential for the discharge to cause or contribute to an exceedance of water quality standards, and therefore no need to include effluent limits for arsenic or mercury. Because the effluent

monitoring results are consistently much lower than the potential limits, EPA does not believe that that there is any need for the permit to require routine monitoring of arsenic or mercury.