

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"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

**Wheaton College  
East Main Street  
Norton, MA 02766**

is authorized to discharge from the facility located at

**Wheaton College Wastewater Treatment Facility  
East Main Street  
Norton, MA 02766**

to receiving water named

**Rumford River (Taunton River Watershed - MA62)**

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on the date of signature.

This permit and the authorization to discharge expires at midnight, four (4) years from the effective date.

This permit supersedes the permit issued on May 12, 1978.

This permit consists of 9 pages in Part I including effluent limitations, monitoring requirements, Attachments A and B, and 35 pages in Part II including General Conditions and Definitions.

Signed this 19<sup>TH</sup> day of August, 2004

/s/ SIGNATURE ON FILE

Linda M. Murphy  
Director  
Office of Ecosystem Protection  
Environmental Protection Agency  
Boston, MA

Director  
Division of Watershed Management  
Department of Environmental Protection  
Commonwealth of Massachusetts  
Boston, MA

PART I

A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge from outfall serial number <b>001</b> , treated effluent to the Rumford River. Such discharges shall be limited and monitored as specified below.							
<u>EFFLUENT CHARACTERISTIC</u>	<u>EFFLUENT LIMITS</u>					<u>MONITORING REQUIREMENTS</u>	
<b>PARAMETER</b>	<b>AVERAGE MONTHLY</b>	<b>AVERAGE WEEKLY</b>	<b>AVERAGE MONTHLY</b>	<b>AVERAGE WEEKLY</b>	<b>MAXIMUM DAILY</b>	<b>MEASUREMENT FREQUENCY</b>	<b>SAMPLE<sup>*,2,4</sup> TYPE</b>
FLOW	***	***	0.12 MGD	***	0.16 MGD	CONTINUOUS	METER
BOD <sub>5</sub> <sup>3</sup>	30 lbs/Day 14 kgs/Day	45 lbs/Day 20 kgs/Day	30 mg/l	45 mg/l	REPORT	1/WEEK	24-HOUR COMPOSITE <sup>4</sup>
TSS <sup>3</sup>	30 lbs/Day 14 kgs/Day	45 lbs/Day 20 kgs/Day	30 mg/l	45 mg/l	REPORT	1/WEEK	24-HOUR COMPOSITE <sup>4</sup>
pH RANGE <sup>1</sup>	6.5 - 8.3 SU SEE PERMIT PAGE 4 OF 9, PARAGRAPH I.A.1.b.					5/WEEK	GRAB
FECAL COLIFORM <sup>1,5</sup> (April 1 through October 31)	***	***	200cfu/100 ml	***	400cfu/100 ml	1/WEEK	GRAB
TOTAL RESIDUAL CHLORINE <sup>1,6,7,8</sup> (April 1 through October 31)	***	***	0.19 mg/l	***	0.32 mg/l	2/DAY	GRAB
TOTAL PHOSPHORUS	1 lbs/Day 0.45 kgs/Day	***	1 mg/l	***	***	1/MONTH	24-HOUR COMPOSITE <sup>4</sup>
TOTAL AMMONIA NITROGEN, AS N	***	***	***	Report mg/l	***	***	1/MONTH
TOTAL KJELDAHL NITROGEN	***	***	***	Report mg/l	***	***	1/MONTH
TOTAL NITRATE	***	***	***	Report mg/l	***	***	1/MONTH
TOTAL NITRITE	***	***	***	Report mg/l	***	***	1/MONTH

WHOLE EFFLUENT TOXICITY Footnotes <sup>9,10,11</sup>	Acute LC <sub>50</sub> ≥ 100% Chronic NOEC - Report	4/YEAR
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\* All sampling shall be representative of the effluent that is discharged through outfall 001 to the Rumford River. A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of every month. Any deviations from the routine sampling program shall be documented in correspondence appended to the applicable discharge monitoring report that is submitted to EPA. In addition, all samples shall be analyzed using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136.

Footnotes:

1. Required for State Certification.
2. All required effluent samples shall be collected at the outlet of the chlorine contact tank and prior to mixing with other sources. Any change in sampling location must be reviewed and approved in writing by EPA and MADEP. All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. All samples shall be 8-hour composites unless specified as a grab sample in 40 CFR §136. Sampling must be representative and done at the same time each day.
3. Sampling required for influent and effluent.
4. An 24-hour composite sample will consist of at least twenty-four (24) grab samples taken during one calendar day.
5. Fecal coliform monitoring will be conducted seasonally from April 1 through October 31. Fecal coliform discharges shall not exceed a monthly geometric mean of 200 colony forming units (cfu) per 100 ml, nor shall they exceed 400 cfu per 100 ml as a daily maximum. This sampling shall be conducted concurrently with a TRC sampling.
6. The limit at which compliance/non-compliance determinations will be based is the Minimum Level (ML). For this permit, the ML for Total Residual Chlorine (TRC) has been defined as 20 ug/l and this value may be reduced by permit modifications as more sensitive methods are approved by EPA and the State. Any value below 20 ug/l shall be reported as zero.
7. TRC shall be tested using EPA-approved methods may be found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, 4500-CL E and 4500-CL G, or USEPA Manual of Methods of Analysis of Water and Wastes, Method 330.5. If EPA approves a more sensitive method of analysis for TRC, the permit will be reopened to require the use of the new method with a corresponding lower ML.
8. Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include

the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

9. The permittee shall conduct modified acute toxicity tests four times per year. The chronic test may be used to calculate the acute LC<sub>50</sub> at the 48 hour exposure interval. Four times per year the permittee shall perform a modified acute test using Ceriodaphnia dubia and Pimephales promelas. Toxicity test samples shall be collected during the second week of the months of February, May, August and November. The test results shall be submitted by the last day of the month following the completion of the test. The results are due March 31, June 30, September 30 and December 31, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit.

Test Dates Second Week in	Submit Results By:	Test Species	Acute Limit LC <sub>50</sub>	Chronic Limit C-NOEC
February May August November	March 31 June 30 September 30 December 31	<u>Ceriodaphnia dubia</u> and <u>Pimephales promelas</u>	≥ 100%	Report Endpoint

After submitting **one year** and a **minimum** of four consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the WET testing requirements. The permittee is required to continue testing at the frequency specified in the permit until notice is received by certified mail from the EPA that the WET testing requirement has been changed.

10. The LC<sub>50</sub> is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.
11. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall follow procedures outlined in **Attachment B Section IV., DILUTION WATER** in order to obtain permission to use an alternate dilution water. In lieu of individual approvals for alternate dilution water required in **Attachment B**, EPA-New England has developed a Self-Implementing Alternative Dilution Water Guidance document (called “Guidance Document”) which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. If this Guidance document is revoked, the permittee shall revert to obtaining approval as outlined in **Attachment B**. The “Guidance Document” has been sent to all permittees with their annual set of DMRs and Revised Updated Instructions for Completing EPA’s Pre-Printed NPDES Discharge Monitoring Report (DMR) Form 3320-1 and is not intended as a direct attachment to this permit. Any modification or revocation to this “Guidance Document” will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment B**.

Part I.A.1.

- a. The discharge shall not cause a violation of the water quality standards of the receiving waters.
- b. The pH of the effluent shall not be less than 6.5 nor greater than 8.3 at any time.
- c. The discharge shall not cause objectionable discoloration of the receiving waters.
- d. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.
- e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.
- f. When the effluent discharged for a period of 90 consecutive days exceeds 80 percent of the designed flow, 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.
- g. The permittee shall minimize the use of chlorine while maintaining adequate bacterial control.
- h. The results of sampling for any parameter above its required frequency must also be reported.

2. All POTWs must provide adequate notice to the Director of the following:

- a. Any substantial change in the volume or character of pollutants being introduced into the treatment system, such as chemicals used in the school laboratories.

3. Toxics Control

- a. The permittee shall not discharge any pollutant or combination of pollutants in toxic amounts.
- b. Any toxic components of the effluent shall not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

#### 4. Numerical Effluent Limitations for Toxicants

EPA or DEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

### **B. UNAUTHORIZED DISCHARGES**

The permittee is authorized to discharge only 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 Section D.1.e. (1) 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:

#### 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.

#### 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.

#### 3. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall continue to provide an alternative power source with which to sufficiently operate its treatment works (as defined at 40 CFR §122.2).

### **D. SLUDGE CONDITIONS**

1. The permittee shall comply with all existing federal and 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 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 also do not apply to facilities which do not dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g. lagoons- reed beds), or are otherwise excluded under 40 CFR 503.6.
5. The permittee shall use and comply with the attached compliance guidance document to determine appropriate conditions. 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 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 1500	1 /quarter
1500 to less than 15000	6 /year
15000 +	1 /month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR 503.8.
8. The permittee shall submit an annual report containing the information specified in the guidance by **February 19**. Reports shall be submitted to the address contained in the reporting section of the permit. Sludge monitoring is not required by the permittee when the permittee is not

responsible for the ultimate sludge disposal. The permittee must be assured that any third party contractor is in compliance with appropriate regulatory requirements. In such case, the permittee is required only to submit an annual report by **February 19** containing the following information:

- Name and address of contractor responsible for sludge disposal
- Quantity of sludge in dry metric tons removed from the facility by the sludge contractor

## **E. MONITORING AND REPORTING**

### 1. Reporting

Monitoring results obtained during each calendar month shall be summarized and reported on Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the following month.

Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director and the State at the following addresses:

Environmental Protection Agency  
Water Technical Unit (SEW)  
P.O. Box 8127  
Boston, Massachusetts 02114

The State Agency is:

Massachusetts Department of Environmental Protection  
Bureau of Resource Protection  
Southeast Regional Office  
20 Riverside Drive  
Lakeville, Massachusetts 02347

Signed and dated Discharge Monitoring Report Forms and toxicity test reports required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection  
Division of Watershed Management  
Surface Water Discharge Permit Program  
627 Main Street, 2nd Floor  
Worcester, Massachusetts 01608

## **F. STATE PERMIT CONDITIONS**

This Discharge Permit is issued jointly by the U. S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP) under Federal and State law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MA DEP pursuant to M.G.L. Chap. 21, §43.

Each Agency shall have the independent right to enforce the terms and conditions of this Permit. 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 this Permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this Permit is declared, invalid, illegal or otherwise issued in violation of State law such permit shall remain in full force and effect under Federal law as an NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this Permit is declared invalid, illegal or otherwise issued in violation of Federal law, this Permit shall remain in full force and effect under State law as a Permit issued by the Commonwealth of Massachusetts.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
NEW ENGLAND  
1 CONGRESS STREET, SUITE 1100  
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

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

NPDES PERMIT NO.: **MA0026182**

NAME AND ADDRESS OF APPLICANT:

**Wheaton College  
East Main Street  
Norton, MA 02766**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Wheaton College  
East Main Street  
Norton, MA 02766**

RECEIVING WATER: **Rumford River (Taunton River Watershed - MA62)**

CLASSIFICATION: **Class B - Warm Water**

**I. PROPOSED ACTION**

The above named applicants have applied to the U.S. Environmental Protection Agency for re-issuance of their National Pollutant Discharge Elimination System (NPDES) permit to discharge into the designated receiving water. The current permit expired on July 1, 1980. A re-application was submitted December 18, 1980 and an updated re-application was received March 20, 2004. This permit, after it becomes effective, will expire four (4) years from the effective date. The four year permit term makes this permit expiration coincide with other NPDES permits in the Taunton River Watershed.

**II. TYPE OF FACILITY, AND DISCHARGE LOCATION**

The facility is engaged in the collection and treatment of wastewater. The discharge is from the Wastewater Treatment Plant. The effluent is discharged to the Rumford River (See Figure 1).

The facility's discharge outfall is listed below:

<u>Outfall</u>	<u>Description of Discharge</u>	<u>Outfall Location</u>
001	Treated Effluent	Rumford River

**III. DESCRIPTION OF THE DISCHARGE**

A quantitative description of the effluent data can be found in Attachment A of this fact sheet.

**IV. LIMITATIONS AND CONDITIONS**

The effluent limitations and monitoring requirements may be found in the draft NPDES permit.

**V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION****A. PROCESS DESCRIPTION**

The treatment facility is a secondary treatment, extended aeration package wastewater plant (See Figure 2). The facility's design flow is 120,000 gallons per day (gpd) on an annual average. The maximum daily design flow is 160,000 gpd. The major treatment units consist of a pump station, grinder, aeration tanks, clarifiers, flow meters and chlorine contact tanks.

Wastewater generated on campus is conveyed to a wet well equipped with two (2) submersible pumps. The wet well is located just outside the machinery building of the wastewater treatment plant. The wastewater enters the plant through a 4-inch force main leading from the submersible pumps to a grinder to shred incoming solid material. The wastewater then passes through a manifold system where flow is diverted to one of two treatment units via 6-inch force mains.

Each treatment unit is comprised of a circular, peripheral aeration tank surrounding an inner circular clarifier. Air for the aeration tanks is supplied by three blowers connected to drop pipes with diffusers. For aeration tank A, waste sludge is pumped via an overhead pipe to the sludge storage tank in tank B. Wasted sludge is periodically removed by a septage hauling truck.

Flow enters the clarifier through a submerged pipe located in the center of each treatment unit. The clarified effluent is discharged over a v-notch weir into the effluent channel where flow from each unit is measured separately. The flow meter for Treatment Unit A is located in the meter chamber located adjacent to the control building. The meter for Treatment Unit B is located in a chamber between the treatment unit and the chlorine contact chamber.

Flow in the metering chambers combines in a single 8-inch pipe and then enters the underground chlorine contact tank. Effluent is disinfected in 2-1,500 gallon septic tanks with sodium hypochlorite. Flow is then discharged to the Rumford River via a 1,100 foot long pipe to a ten inch submerged outfall.

**B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS****1. Overview of Federal and State Regulations**

EPA is required to consider technology and water quality requirements when developing permit effluent limits. Technology based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Act (see 40 CFR 125 Subpart A) to meet Best Practicable Control Technology Currently Available (BPT), Best Conventional Control Technology (BCT) for conventional pollutants and Best Available Technology Economically Achievable (BAT) for toxic pollutants.

EPA regulations require NPDES permits to contain effluent limits more stringent than technology-based limits where more stringent limits are necessary to maintain or achieve federal or state water quality standards.

The Wheaton College Wastewater Treatment Facility is similar to Publicly Owned Treatment Works (POTWs) which are subject to the secondary treatment requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f). In the absence of specific national standards for non-POTW secondary treated domestic wastewater discharges, limitations may be established on a case-by-case basis using Best Professional Judgement (BPJ) pursuant to Section 401 (a) (1) of the CWA.

Under Section 301(b)(1)(C) of the Clean Water Act (CWA), discharges are subject to effluent limitations based on Water Quality Standards. The Massachusetts Surface Water Quality Standards include the requirements for the regulation and control of toxic constituents and also require that EPA criteria established pursuant to Section 304(a) of the CWA shall be used unless site specific criteria are established. The State will limit or prohibit discharges of pollutants to surface waters to assure that surface water quality standards of the receiving waters are protected and maintained or attained.

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 caused, has reasonable potential to cause, or contributes to an excursion above any water quality criterion [40 CFR §122.44(d)]. An excursion occurs if the projected or actual instream concentrations exceed the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and non-point sources of pollution, variability of the pollutant in the effluent, sensitivity of the species to toxicity and, where appropriate, the dilution of the effluent in the receiving water.

## **2. Water Quality Standards; Designated Uses; Outfall 001**

The receiving water, the Rumford River, has been classified as Class B - Warm Water in the Massachusetts Surface Water Quality Standards, 314 CMR 4.05(4)(a). Class B waters are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. The waters should have consistently good aesthetic value.

A warm water fishery is defined in the Massachusetts Surface Water Quality Standards (314 CMR 4.02) as waters in which the maximum mean monthly temperature generally exceeds 20° Celsius during the summer months and are not capable of supporting a year-round population of cold water stenothermal aquatic life.

The Rumford River is listed in the Massachusetts Year 2002 Integrated List of Waters as a “waters requiring a TMDL” (Total Maximum Daily Loading study). The pollutants causing the impairment are listed as pesticides, organic enrichment/low dissolved oxygen, and pathogens.

### **Available Dilution**

Water quality based limitations are established with the use of a calculated available dilution. Title 314 CMR 4.03(3)(a) requires that effluent dilution be calculated based on the receiving water 7Q10. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, recorded over a 10-year recurrence interval. Additionally, the 7Q10 flow is used to calculate available effluent dilution.

The facility design flow is 120,000 gallons per day (0.120 mgd). There are no available stream flow statistics for the Rumford River. Complicating matters, the Rumford River flows out of the Norton Reservoir approximately two miles upstream of the point of discharge. Flow from the reservoir is controlled by a dam which is operated by the Town of Norton. Little information was available from the Town about the operation of the dam.

The Rumford River joins with the Wading River approximately 1.5 miles downstream from the Wheaton College discharge to form the Threemile River. The drainage area contributing at the point of confluence is 65.6 square miles. Previous studies have determined that the 7Q10 flow of the Threemile River at Crane Street, approximately 1 mile down stream of the confluence, is 5.9 cfs (3.8 mgd). Using the drainage-area ratio method, the 7Q10 for the Threemile River just after the point of confluence is 5.4 cfs (3.5 mgd).

$$\frac{5.9 \text{ cfs}}{71.8 \text{ sq. miles}} = \frac{x}{65.6 \text{ sq. miles}}$$

$$x = \frac{(5.9 \text{ cfs})(65.6 \text{ sq. miles})}{71.8 \text{ sq. miles}}$$

$$x = 5.4 \text{ cfs (3.5 mgd)}$$

The USGS operates a long-term gaging station on the Wading River (01090004). The 7Q10 flow at this station is 2.2 cfs (1.42 mgd). The contributing drainage area is 43.3 square miles. Using the drainage-area ratio method, the 7Q10 for the Wading River just prior to the point of confluence is 2.25 cfs (1.4 mgd).

$$\frac{2.2 \text{ cfs}}{43.3 \text{ sq. miles}} = \frac{X}{44.3 \text{ sq. miles}}$$

$$x = \frac{(2.2 \text{ cfs})(44.3 \text{ sq. miles})}{43.3 \text{ sq. miles}}$$

$$x = 2.25 \text{ cfs (1.4 mgd)}$$

Assuming that the 7Q10 flow of the Rumford River accounts for the difference between the 7Q10 flows of the Wading and Threemile Rivers, the 7Q10 flow of the Rumford, just prior to the point of confluence, is 2.1 mgd.

$$5.4 \text{ cfs (7Q10 of the Threemile River)} - 2.25 \text{ cfs (7Q10 of the Wading River)} = 3.15 \text{ cfs (2.1 mgd)}$$

Again by using the drainage area ratio method, it is possible to calculate the 7Q10 flow at the point of discharge which has a drainage area of 20.8 square miles. The estimated 7Q10 flow at the point of discharge is 1.9 mgd.

$$\frac{3.15 \text{ cfs}}{22.3 \text{ sq. miles}} = \frac{X}{20.8 \text{ sq. miles}}$$

$$x = \frac{(3.15\text{cfs})(20.8\text{sq. miles})}{22.3 \text{ sq. miles}}$$

$$x = 2.9 \text{ cfs (1.9 mgd)}$$

Therefore, the dilution factor for the Wheaton College discharge is 17:1.

$$\frac{\text{River flow (7Q10) + Daily average design effluent flow}}{\text{Daily average design effluent flow}} = \text{Dilution Factor}$$

$$\frac{1.9 \text{ mgd} + .120 \text{ mgd}}{0.120 \text{ mgd}} = 17$$

**FLOW**

The design flow rate (average monthly) is 120,000 gallons per day (gpd). The draft permit maintains the average monthly flow limit of 120,000 gallons per day (gpd) from the previous permit. The measurement frequency continues to be continuous.

**OUTFALL 001 - CONVENTIONAL POLLUTANTS**

Biological Oxygen Demand (BOD<sub>5</sub>) - The discharge is similar to a Publicly Owned Treatment Works (POTWs) which are subject to the secondary treatment requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f). In the absence of specific national standards for non-POTW secondary treated domestic wastewater discharges, limitations may be established on a case-by-case basis using Best Professional Judgement (BPJ) pursuant to Section 401 (a) (1) of the CWA. The secondary treatment limitations are a monthly average BOD<sub>5</sub> concentration of 30 mg/l and a weekly average concentrations of 45 mg/l. The monthly average of 30 mg/l was required under the previous permit, as was a maximum daily BOD<sub>5</sub> concentration of 50 mg/l, which has been changed to a report-only requirement. A weekly average of 45 mg/l is a new requirement. The mass limitations for BOD are based on a 120,000 gallon per day design flow.

Total Suspended Solids (TSS) - The discharge is similar to a Publicly Owned Treatment Works (POTWs) which are subject to the secondary treatment requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f). In the absence of specific national standards for non-POTW secondary treated domestic wastewater discharges, limitations may be established on a case-by-case basis using Best Professional Judgement (BPJ) pursuant to Section 401 (a) (1) of the CWA. The secondary treatment limitations are a monthly average TSS concentration of 30 mg/l and a weekly average concentration of 45 mg/l. The monthly average of 30 mg/l was required under the previous permit, as was a maximum daily TSS concentration of 50 mg/l, which has been changed to a report-only requirement. A weekly average of 45 mg/l is a new requirement. The mass limitations for TSS are based on a 120,000 gallon per day design flow.

BOD<sub>5</sub> and TSS Mass Loading Calculations:

Calculations of maximum allowable loads for average weekly, and average monthly BOD<sub>5</sub> and TSS are based on the following equation:

$$L = C \times DF \times 8.34 \text{ or } L = C \times DF \times 3.79 \text{ where:}$$

L = Maximum allowable load in lbs/day.

C = Maximum allowable effluent concentration for reporting period in mg/l. Reporting periods are average monthly and weekly.

DF = Design flow of facility in MGD.

8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day.

3.79 = Factor to convert effluent concentration in mg/l and design flow in MGD to kgs/day.

$$\text{(Concentration limit) [45] X 8.34 (Constant) X 0.120 (design flow) = 45 lb/day}$$

$$\text{(Concentration limit) [45] X 3.79 (Constant) X 0.120 (design flow) = 20 kg/day}$$

$$\text{(Concentration limit) [30] X 8.34 (Constant) X 0.120 (design flow) = 30 lb/day}$$

$$\text{(Concentration limit) [30] X 3.79 (Constant) X 0.120 (design flow) = 14 kg/day}$$

Eighty-Five Percent (85%) BOD<sub>5</sub> and TSS Removal Requirement - the provisions of 40 CFR §133.102(3) requires that the 30 day average percent removal for BOD and TSS be not less than 85%.

pH - The draft permit includes proposed pH limitations which are required by state water quality standards, and are at least as stringent as pH limitations set forth at 40 CFR 133.102(c). Class B waters shall be in a range of 6.5 through 8.3 standard units and not more than 0.5 standard units outside of the background range. There shall be no change from background conditions that would impair any use assigned to this class.

Fecal Coliform Bacteria - The numerical limitations for fecal coliform are based on state certification requirements under Section 401(a)(1) of the CWA, as described in 40 CFR 124.53 and 124.55. These limitations are also in accordance with the Massachusetts Surface Water Quality Standards 314 CMR 4.05 (4)(a)4.a.

The proposed limits in the draft permit are 200 colony forming units (cfu)/100 ml average monthly and 400 cfu/100 ml maximum daily. These limits are seasonal and apply during the period beginning April 1 through October 31, annually. The monitoring frequency for fecal coliform has been increased to once (1) per week and must be collected concurrent with sampling for Total Residual Chlorine.

Settleable Solids - The monitoring requirements for settleable solids have been removed from this permit. They are no longer required as a condition for state certification under Section 403 of the CWA.

**OUTFALL 001 - NON-CONVENTIONAL POLLUTANTS**

Total Residual Chlorine (TRC) - Chlorine is a toxic chemical. The draft permit includes total residual chlorine limitations which are based on state water quality standards [Title 314 CMR 4.05(5)(e)] and *the State's Implementation Policy for the Control of Toxic Pollutants in Surface Waters, February 23, 1990*. Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. As such, the permittee should evaluate chlorination alternatives such as ultraviolet disinfection, as well as state of the art chlorination facilities which enable adequate control over chlorine dosing levels. Given the limitation of grab samples for ensuring that chlorine limits are complied with at all times, future permits may require continuous chlorine monitoring to assure that toxic levels are not discharged to the receiving water.

The water quality standards for chlorine defined in the 1998 EPA National Recommended Water Quality Criteria for freshwater are 19 ug/l daily maximum and 11 ug/l monthly average in the receiving water. Given the dilution factor of 17, total residual chlorine limits have been calculated as 0.32 mg/l maximum daily and 0.19 mg/l average monthly. One sample per week must be collected concurrent with the once per week Fecal Coliform Bacteria sample. The monitoring frequency for Total Residual Chlorine has been increased to twice daily with one sample collected in the early morning hours before the start of classes and the other sample should be collected in the mid-afternoon. These limits are seasonal and apply during the period beginning April 1 through October 31, annually.

Total Residual Chlorine Limitations:

(acute criteria \* dilution factor) = Acute (Maximum Daily)  
(19 ug/l x 17) = 323 ug/l = 0.32 mg/l

(chronic criteria \* dilution factor) = Chronic (Monthly Average)  
(11 ug/l x 17) = 187 ug/l = 0.19 mg/l

Total Phosphorus - The Massachusetts Surface Water Quality Standards (314 CMR 4.00) do not contain numerical criteria for total phosphorus. The criteria for nutrients is found at 314 CMR 4.05(5)(c), which states that nutrients "shall not exceed the site specific limits necessary to control accelerated or cultural eutrophication". The Water Quality Standards also require that "any existing point source discharges containing nutrients in concentrations which encourage eutrophication or the growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients (314 CMR 4.04). MADEP has established that a monthly average total phosphorus limit of 0.2 mg/l represents highest and best practical treatment for POTWs.

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

More recently, EPA has released "Ecoregional Nutrient Criteria", established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published criteria represent conditions in waters in each specific ecoregion which are minimally impacted by human activities, and thus representative of waters without cultural eutrophication. Norton, MA is within Ecoregion XIV, Eastern Coastal Plains. The total phosphorus criteria for this Ecoregion XIV is 24 ug/l (0.024 mg/l) and can be founded in the Ambient Water Quality Criteria

Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV, published in December 2000.

The total phosphorus concentration reported in the 2004 application was 7.1 mg/l. Therefore, the calculated instream contribution from Wheaton College is 0.42 mg/l (7.1 mg divided by the dilution factor of 17). Instream water quality data for the Rumford River in the vicinity of the discharge is absent. However, the Rumford River is listed as requiring a TMDL due to organic enrichment/low dissolved oxygen among other pollutants.

Given the above facts, EPA has included an average monthly effluent limit of 1 mg/l in this permit. The permittee shall sample and report total phosphorus concentrations once (1) per week. If the effluent monitoring results indicate that the total phosphorus concentration exceed criteria and contribute to eutrophication a limit of 0.2 mg/l may be included in the next permit issuance.

Nitrogen - Extensive water quality monitoring in Mount Hope Bay has shown a system that is highly eutrophic, with dissolved oxygen concentrations in the bottom waters frequently dropping below 2 mg/l for extended periods over a large area of the bay (New England Power Company data, 1998). The mouth of the Taunton River, of which the Three Mile River is a tributary, is on the Massachusetts 303(d) list for organic enrichment/low dissolved oxygen. In marine systems, discharges of nitrogen are typically the cause of such conditions. The monitoring data collected by the permittee, along with data from other discharges to the Taunton River are necessary for the future completion of a TMDL.

Copper - Certain metals in water can be toxic to aquatic life. There is a need to limit toxic metal concentrations in the effluent where aquatic life may be impacted. There is no available data regarding copper concentrations in the effluent at this facility. Therefore, copper should be sampled as part of Whole Effluent Toxicity (WET) testing.

EPA is required to limit any pollutant or pollutant parameter that is or may be discharged at a level that caused, has reasonable potential to cause or contributes to an excursion above any water quality criterion. If copper is determined to be a problem as a result of WET testing, effluent limits for copper will be set in the future.

Chronic                    (chronic criteria \* dilution factor) = Chronic (Monthly Average)  
(3.1 ug/l \* 17) = 52.7 ug/l = 0.053 mg/l

Acute                      (acute criteria \* dilution factor) = Acute (Maximum Daily)  
(4.8 ug/l \* 17) = 81.6 ug/l = 0.082 mg/l

#### **OUTFALL 001 - WHOLE EFFLUENT TOXICITY (WET)**

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include the following narrative statement and requires that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria: All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. The Region's current policy is to include toxicity testing requirements in all permits, while

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

Based on the potential for toxicity resulting from domestic sewage, and in accordance with EPA national and regional policy, the draft permit includes chronic and acute toxicity limitations and monitoring requirements. (See e.g. "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 50 Fed. Reg. 30,784 (July 24, 1985); see also, EPA's "Technical Support Document for Water Quality-Based Toxics Control", September, 1991.)

Pursuant to EPA Region I policy, a minor discharge having a dilution ratio between 10:1 and 20:1 requires 7-day chronic and modified acute testing four times per year. The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analyses; (2) bioavailability of pollutants after discharge is best measured by toxicity testing including any synergistic effects of pollutants; and (3) pollutants for which there are inadequate chemical analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in conjunction with pollutant specific control procedures to control the discharge of toxic pollutants.

The draft permit requires that the permittee conduct 7-day chronic and modified acute WET testing for the Outfall 001 effluent four times per year (once per quarter) and that each test include the use of *Ceriodaphnia dubia* and *Pimephales promelas* in accordance with EPA Region I protocol to be found in permit Attachment A. A permit limit is set only for the acute test.

#### **VI. SLUDGE CONDITIONS**

Section 405(d) of the CWA requires that EPA develop technical regulations regarding the use and disposal of sewage sludge. These regulations are found at 40 CFR part 503 and apply to any facility engaged in the treatment of domestic sewage. The CWA further requires that these conditions be implemented through permits.

The Wheaton College WWTF generates 32 dry metric tons gallons of sewer sludge per year. The sludge is trucked off-site for to treatment by Mass Environmental Services. Solids are then sent to a landfill in Rochester, NH.

#### **VII. ANTI-BACKSLIDING**

Anti-backsliding as defined at 40 CFR §122.44(l)(1) requires reissued permits to contain limitations as stringent or more stringent than those of the previous permit unless the circumstances allow application of one of the defined exceptions to this regulation. Anti-backsliding does not apply when changes to limits are based on new information not available at the time of the previous permit reissuance [40 CFR §122.44(l)(2)(i)(B)(1)] or when limits are changed as a result of material and substantial additions or alterations to the permitted facility which occurred after permit issuance which justify the application of less stringent limitations, as defined at 40 CFR § 122.44(l)(2)(i)(A).

#### **VIII. ANTI-DEGRADATION**

The Massachusetts Anti-degradation Policy is found at Title 314 CMR 4.04. All existing uses of the Rumford River must be protected. This draft permit has discharge limits as or more stringent than the current permit with the exception of a maximum daily limit for BOD and TSS, which is now a report-only requirement and a limit for settleable solids which has been eliminated from the permit because MADEP no longer requires it as a condition for obtaining state certification. There has been no change in the outfall location.

**IX. STATE PERMIT CONDITIONS**

The NPDES Permit is issued jointly by the U. S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of the permit are, therefore, incorporated into and constitute a discharge permit issued by the MADEP Commissioner who designates signature authority to the Director of the Division of Watershed Management pursuant to M.G.L. Chap. 21, §43.

**X. STATE CERTIFICATION REQUIREMENTS**

The staff of the Massachusetts Department of Environmental Protection ("MADEP") has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 CFR § 124.53 and expects that the draft permit will be certified.

**XI. PUBLIC COMMENT PERIOD AND PROCEDURES FOR FINAL DECISION**

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection, MA Unit, One Congress Street, Suite-1100, Boston, Massachusetts 02114. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. Public hearings may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates a significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

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

**XII. EPA CONTACT**

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Michele Cobban Barden, Environmental Scientist  
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November 1, 2004

Date

Linda M. Murphy, Director  
Office of Ecosystem Protection  
U.S. Environmental Protection Agency