

**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),

**Town of Winchendon
109 Front Street
Winchendon, Massachusetts 01475**

is authorized to discharge from a facility located at

**Winchendon Water Pollution Control Facility
637 River Street
Winchendon, Massachusetts 01475**

to a receiving waters named

**Millers River
USGS Hydrologic code: 01080202; Basin Code: MA35-02**

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

This permit shall become effective on the first day of the calendar month immediately following 60 days after signature.

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

This permit supersedes the permit issued on September 8, 2004.

This permit consists of 15 pages in Part I including effluent limitations, monitoring requirements, Attachment A (Freshwater Chronic Modified Acute WET Protocol), Attachment B (Reporting Submissions) and 25 pages in Part II including Standard Conditions and Definitions.

Signed this 25th day of February, 2011

/S/SIGNATURE ON FILE

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 treated effluent from outfall serial number **001** to the Millers River. Such discharge shall be limited and monitored by the permittee as specified below.

<u>EFFLUENT CHARACTERISTIC</u>	<u>EFFLUENT LIMITS</u>						<u>MONITORING REQUIREMENTS</u>	
	Mass Limits			Concentration Limits				
PARAMETER	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	MEASUREMENT FREQUENCY	SAMPLE TYPE³
FLOW	***	***	***	1.1 MGD	***	Report MGD	CONTINUOUS	RECORDER
FLOW ¹	***	***	***	Report MGD	***	***	CONTINUOUS	RECORDER
BOD ₅ ² (June 1-October 31)	138 lbs/Day	Report lbs/Day	***	15 mg/l	25 mg/l	30 mg/l	2/WEEK	24-HOUR COMPOSITE
TSS ² (June 1-October 31)	138 lbs/Day	Report lbs/Day	***	15 mg/l	25 mg/l	30 mg/l	2/WEEK	24-HOUR COMPOSITE
BOD ₅ ² (November 1-May 31)	138 lbs/Day	Report lbs/Day	***	15 mg/l	25 mg/l	Report mg/l	1/WEEK	24-HOUR COMPOSITE
TSS ² (November 1-May 31)	138 lbs/Day	Report lbs/Day	***	15 mg/l	25 mg/l	Report mg/l	1/WEEK	24-HOUR COMPOSITE
pH RANGE ⁴	6.5 - 8.3 SU SEE PERMIT PAGE 6 OF 15. PARAGRAPH I.A.2.b.						1/DAY	GRAB
E.-coli ^{4,5} (April 1- October 31)	***	***	***	126 cfu/100 ml	***	409 cfu/100 ml	2/WEEK	GRAB
COPPER,TOTAL ⁶	***	***	***	2.1 ug/l	***	2.6 ug/l	1/MONTH	24-HOUR COMPOSITE

Limits continued on next page

Limits continued from previous page

A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Millers River. Such discharge shall be limited and monitored by the permittee as specified below.								
<u>EFFLUENT CHARACTERISTIC</u>	<u>EFFLUENT LIMITS</u>						<u>MONITORING REQUIREMENTS</u>	
	Mass Limits			Concentration Limits				
PARAMETER	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	MEASUREMENT FREQUENCY	SAMPLE TYPE ³
TOTAL NITROGEN ⁷	Report lbs/Day	***	Report lbs/Day	Report mg/l	***	Report mg/l	2/MONTH	24-HOUR COMPOSITE
TOTAL NITRITE + NITRATE	***	***	***	Report mg/l	***	Report mg/l	2/MONTH	24-HOUR COMPOSITE
TOTAL KJELDAHL NITROGEN	***	***	***	Report mg/l	***	Report mg/l	2/MONTH	24-HOUR COMPOSITE
TOTAL AMMONIA AS N (June 1 -October 31)	37 lbs/Day	***	***	4.0 mg/l	6.0 mg/l	8.0 mg/l	2/MONTH	24-HOUR COMPOSITE
TOTAL AMMONIA AS N (November 1-May 31)	***	***	***	Report mg/l	***	Report mg/l	1/MONTH	24-HOUR COMPOSITE
TOTAL PHOPHORUS ⁸ (April 1 -October 31)	Report lbs/Day	***	***	0.5 mg/l	***	Report mg/l	2/WEEK	24-HOUR COMPOSITE
TOTAL PHOPHORUS (November 1-March 31)	Report lbs/Day	***	***	Report mg/l	***	Report mg/l	2/MONTH	24-HOUR COMPOSITE
WHOLE EFFLUENT TOXICITY (WET) ^{9, 10, 11}	Chronic – NOEC ≥ 22% ACUTE LC ₅₀ ≥ 100%						4/YEAR	24-HOUR COMPOSITE

Footnotes:

- 1) Report annual average, monthly average, and the maximum daily flow. The limit is an annual average, which shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the previous eleven months.
- 2) Sampling required for influent and effluent.
- 3) A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented in correspondence appended to the applicable discharge monitoring report.

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 required effluent samples shall be collected at the point specified herein. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP	
PARAMETER	SAMPLE LOCATION
FLOW	Effluent Parshall Flume
BOD ₅ , TSS, pH RANGE, TOTAL AMMONIA AS N, TOTAL , E. - COLI, KJELDAHL NITROGEN, TOTAL NITRITE and NITRATE, WHOLE EFFLUENT TOXICITY, TOTAL PHOSPHORUS, and TOTAL COPPER	After UV disinfection WET Dilution water: Millers River Upstream at bridge
BOD ₅ and TSS (Influent)	Sampler at Head Works

- 4) Required for State Certification.
- 5) The average monthly limit for *E. coli* is expressed as a geometric mean. All test results shall be used in the calculation and reporting of the monthly average and maximum daily data submitted on the DMR (see Part II. Section D.1.d(2)).
- 6) Total copper analysis shall be performed using EPA Method, 200.8, ICP/MS - inductively coupled plasma mass spectrometry.
- 7) See Part I.E, Special Conditions, for requirements to evaluate and implement optimization of nitrogen removal.

- 8) The limit of 0.5 mg/l is a sixty (60) day rolling average limit. The 60 day average value for each day in a given month, beginning on the 60th day after April 1st, must be calculated and the highest 60 day average value for that month reported on the monthly DMR as a “monthly average”. Each sixty (60) day value will be calculated as an arithmetic mean. In addition, the daily maximum value must be reported for each month. Consistent with Section B.1, of Part II of the permit, the permittee shall properly operate and maintain the existing phosphorus removal facilities at the treatment plant to obtain the lowest effluent phosphorus concentration that can be reasonably achieved.
- 9) The permittee shall conduct chronic (and modified acute) toxicity tests four (4) times per year using two species, Ceriodaphnia dubia and Pimephales promelas. Toxicity test samples shall be collected and test results shall be submitted according to the following schedule.

Test Dates*	Submit Results By:	Test Species	Acute Limit LC ₅₀	Chronic Limit C-NOEC
January April July October	February 28th May 31st August 31st November 30th	<u>Ceriodaphnia dubia</u> (Daphnid) <u>Pimephales promelas</u> (Fathead minnow) See Attachment A	≥ 100%	≥ 22%

The permittee shall sample during the same weeks of January, April, July and October each year. The tests must be performed in accordance with test procedures and protocols specified in Attachment A of this permit.

After a minimum of four complete and consecutive WET tests, all of which must be valid and demonstrate compliance with the permit limits for whole effluent toxicity, the permittee may submit a written request to the EPA seeking a review of the toxicity test results. If the results of these tests consistently meet the limits during all four consecutive tests, the species tested may be reduced from two to one by a certified letter from the EPA.

- 10) The LC₅₀ 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 shall cause no more than a 50% mortality rate.

Chronic-no observed effect concentration (C-NOEC) is defined as the highest concentration of toxicant or effluent which organisms are exposed to in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation determined from hypothesis testing where the test results exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect. The final limit of "22% or greater" is defined as a sample which is composed of 22% (or greater) effluent, the remainder being dilution water.

- 11) If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A (Toxicity Test Procedure and Protocol) Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found on the EPA, Region I web site at <http://www.epa.gov/Region1/enforcementandassistance/dmr.html> If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance will be transmitted to the permittees. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

Part I.A.2.

- 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 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. The results of sampling for any parameter done in accordance with EPA approved methods above its required frequency must also be reported.

- g. If the average annual flow in any calendar year exceeds 80% of the facility's design flow, the permittee shall submit a report to EPA and MassDEP by March 31 of the following calendar year describing plans for further flow increases and discuss how the permittee will remain in compliance with the effluent limitations in the permit.

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

- a. Any new introduction of pollutants into that POTW from an indirect discharger in a primary industry category 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 POTW; and
 - (2) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

4. Prohibitions Concerning Interference and Pass Through.

- a. Pollutants introduced into POTW's by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

5. 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.

6. Numerical Effluent Limitations for Toxicants

EPA or MassDEP 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.

PART 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 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 to EPA and MassDEP in accordance with Section D.1.e.(1) of the General Requirements of this permit (Twenty-four hour reporting). [Note: SSO Reporting Form (which includes MassDEP Regional Office telephone numbers) for submittal of written report to MassDEP is available on-line at <http://www.mass.gov/dep/water/approvals/surffms.htm#sso>.]

PART 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. Infiltration/Inflow Control Plan:

The permittee shall continue to implement a plan to control infiltration and inflow (I/I) to the separate sewer system. An updated plan shall be submitted to EPA and MassDEP **within six (6) months of the effective date of this permit** (see page 1 of this permit for the effective date) and shall describe the permittee's program for preventing infiltration/inflow related effluent limit violations, and all unauthorized discharges of wastewater, including overflows and by-passes due to excessive infiltration/inflow.

The plan shall include:

- An ongoing program to identify and remove sources of infiltration and inflow. The program shall include the necessary funding level and the source(s) of funding.
- An inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts. Priority should be given to removal of public and private inflow sources that are upstream from, and potentially contribute to, known areas of sewer system backups and/or overflows.
- Identification and prioritization of areas that will provide increased aquifer recharge as the result of reduction/elimination of infiltration and inflow to the system.
- An educational public outreach program for all aspects of I/I control, particularly private inflow.

Reporting Requirements:

A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and the MassDEP annually, **by March 31**. The summary report shall, at a minimum, include:

- A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year.
- Expenditures for any infiltration/inflow related maintenance activities and corrective actions taken during the previous year.
- A map with areas identified for I/I-related investigation/action in the coming year.

- A calculation of the annual average I/I and the maximum month I/I for the reporting year.
- A report of any infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to the Unauthorized Discharges section of this permit.

4. 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 §403.3(o)).

PART 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, including EPA regulations promulgated at 40 CFR Part 503, which prescribe “Standards for the Use or Disposal of Sewage Sludge” pursuant to Section 405(d) of the CWA, 33 U.S.C. § 1345(d).
2. If both state and federal requirements apply to the permittee’s sludge use and/or disposal practices, the permittee shall comply with the more stringent of the applicable requirements.
3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge 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 requirements of 40 CFR Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities which do not use or 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 40 CFR Part 503 requirements include the following elements:
- General requirements
 - Pollutant limitations
 - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
 - Management practices
 - Record keeping
 - Monitoring
 - Reporting

Which of the 40 CFR Part 503 requirements apply to the permittee will depend upon the use or disposal practice followed and upon the quality of material produced by a facility. The EPA Region 1 Guidance document, “EPA Region 1 - NPDES Permit Sludge Compliance Guidance” (November 4, 1999), may be used by the permittee to assist it in determining the applicable requirements.¹

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods), pathogen reduction, and vector attraction reduction (land application and surface disposal), 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

Sampling of the sewage sludge shall use the procedures detailed in 40 CFR 503.8.

7. Under 40 CFR § 503.9(r), the permittee is a “person who prepares sewage sludge” because it “is ... the person who generates sewage sludge during the treatment of domestic sewage in a treatment works” If the permittee contracts with *another* “person who prepares sewage sludge” under 40 CFR § 503.9(r) – i.e., with “a person who derives a material from sewage sludge” – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose.

¹ 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>

If the permittee does not engage a “person who prepares sewage sludge,” as defined in 40 CFR § 503.9(r), for use or disposal, then the permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR §503.7. If the ultimate use or disposal method is land application, the permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.

8. The permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48 (incineration)) by **February 19** (*see also* “EPA Region 1 - NPDES Permit Sludge Compliance Guidance”). Reports shall be submitted to the address contained in the reporting section of the permit. If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:
 - a. Name and address of contractor(s) responsible for sludge preparation, use or disposal
 - b. Quantity of sludge (in dry metric tons) from the POTW that is transferred to the sludge contractor(s), and the method(s) by which the contractor will prepare and use or dispose of the sewage sludge.

PART E. SPECIAL CONDITION

Within six (6) months of the effective date of this permit, the permittee shall complete an evaluation of alternative methods of operating the existing water pollution control facility to optimize the removal of nitrogen, and submit a report to EPA and MassDEP documenting this evaluation and presenting a description of recommended operational changes. The methods to be evaluated include, but are not limited to, operational changes designed to enhance nitrification (seasonal and year round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. The permittee shall implement the recommended operational changes in order to maintain the mass discharge of total nitrogen less than the existing annual discharge load. Existing mass loadings will be based on the **79 lbs/day 2004-2005 baseline estimate**.

The permittee shall also submit an annual report to EPA and MassDEP, **by April 1 each year**, that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year.

PART F. AMBIENT MONITORING

The permittee shall sample for total phosphorus and total copper at a location in the Millers River upstream of the WWTF. The permittee shall sample once per month for twenty four (24) consecutive months beginning the first full month following the effective date of the permit. The permittee shall report the sampling location and results to both EPA and MassDEP with that monthly Discharge Monitoring Report.

Samples shall be collected and analyzed in accordance with a quality assurance/quality control plan, which shall be submitted to EPA and MassDEP with the first set of sampling results. Samples for total phosphorus shall be analyzed using methods found in 40 CFR Part 136. Copper samples shall be analyzed using EPA method 200.8.

The permit may be reopened to include revised limits for total phosphorus and/or total copper based upon the results submitted to EPA and MassDEP.

PART G. 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 all 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 the 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 MassDEP Monthly Operations and Maintenance Report, 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 and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees shall continue to send hard copies of reports other than DMRs (including Monthly Operation and Maintenance Reports) to MassDEP until further notice from MassDEP.

- 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 the 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 (OES04-1)
Boston, MA 02109-3912

And

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

c. Submittal of Reports in Hard Copy Form

Hard copy DMR submittals shall be completed and postmarked no later than the 15th day of the month following the completed reporting period. MassDEP Monthly Operation and Maintenance Reports shall be submitted as an attachment to the DMRs. Signed and dated originals of the DMRs, and all other reports required herein, shall be submitted to the appropriate State addresses and to the EPA address listed below:

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

The State Agency addresses are:

Massachusetts Department of Environmental Protection - Central Region
Bureau of Resource Protection (Municipal)
627 Main Street
Worcester, MA 01608

and

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

H. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.
2. This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.
3. 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 a 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.

Summary of Required Report Submittals

This table is a summary of the reports required to be submitted under this NPDES permit as an aid to the permittee(s). If there are any discrepancies between the permit and this summary, the permittee(s) shall follow the permit requirements. The addresses are for the submittal of hard copies.

When the permittee begins reporting using NetDMR, submittal of hard copies of many of the required reports will not be necessary. See permit conditions for details.

1 U.S. Environmental Protection Agency Water Technical Unit (OES04-SMR) 5 Post Office Square - Suite 100 Boston, MA 02109-3912	2 MassDEP Division of Watershed Management Surface Water Discharge Permit Program 627 Main Street, 2nd Floor Worcester, MA 01608
3 Massachusetts Department of Environmental Protection Central Regional Office- Bureau of Resource Protection 627 Main Street Worcester, MA 01608	

Requirement	Due Date	Addressees
Toxicity test samples shall be collected during the months of. January, April, July, and October [Part I.A Footnote 8]	Results shall be submitted by February 28 th , May 31 st , August 31 st , and November 30 th of each year	1 and 2
If the average annual flow in any calendar year exceeds 80% of the facility's design flow, the permittee shall submit a report to MassDEP. [Part I.A.2.h.]	By March 31 of the following calendar year	1, 2 and 3
Notification of Sanitary Sewer Overflows [Part I.B]	Within 24 hours of SSO event.	1 and 3
Updated infiltration and inflow (I/I) to the separate sewer system. [Part I. C.3]	Shall be submitted to EPA and MassDEP within six (6) months of the effective date of this permit	1, 2, and 3
Annual I/I Summary Report [Part I. C.3]	Annually by March 31	1, 2, and 3
Annual Sludge Report [Part I.D.8]	Annually by February 19	1, 2, and 3

<p>The permittee shall complete an evaluation of alternative methods of operating the existing wastewater treatment facility to optimize the removal of nitrogen, and submit a report. [Part I.E]</p>	<p>Within 6 months of the effective date of the permits</p>	<p>1, 2, and 3</p>
<p>The permittee shall submit a report that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year. [Part I.E]</p>	<p>By April 1st, each year</p>	<p>1, 2, and 3</p>
<p>The permittee shall sample for total phosphorus and total copper and [Part I.F] The permittee shall submit a quality assurance/quality control plan with the first set of sample results.</p>	<p>Report the sampling location and results with that monthly Discharge Monitoring Report.</p>	<p>1, 2, and 3</p>
<p>Monitoring results obtained during each calendar month shall be summarized and reported on Discharge Monitoring Report Form(s) [Part I.G]</p>	<p>Postmarked no later than the 15th day of the following month.</p>	<p>1, 2, and 3</p>

RESPONSE TO PUBLIC COMMENTS
Winchendon Waste Water Treatment Facility (WWTF)
National Pollutant Discharge Elimination System (NPDES) Permit No. MA0100862

The U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) are issuing a final National Pollutant Discharge Elimination System (NPDES) permit for the Winchendon Waste Water Treatment Facility, in Winchendon, Massachusetts. The Final Permit authorizes the Town to discharge wastewater to the Millers River, in accordance with the requirements of the Federal Clean Water Act (CWA), 33 U.S.C. §§ 1251 *et. seq.*, and the Massachusetts Clean Waters Act, M.G.L. Ch. 21, §26-35.

The first Draft Permit public comment period began on August 27, 2010 and ended on September 25, 2010. The public comment period was reopened on October 12, 2010 at the request of the permittee, and ended on November 10, 2010.

Comments were received from:

- 1) Robert Peirent, P.E, Senior Vice President, Tighe and Bond, Inc., on behalf of the Town of Winchendon (“T&B”) in letters dated September 17, 2010, November 8, 2010, and corrections dated November 11, 2010.
- 2) Paul E. Stacey, Director, Planning and Standards Division, Bureau of Water Protection and Land Reuse, Connecticut Department of Environmental Protection (“CTDEP”) in a letter dated September 2, 2010
- 3) Andrea F. Donlon, M.S., River Steward, Connecticut River Watershed Council (“CRWC”) in a letter dated November 10, 2010

Some comments have been edited to correct spelling, grammar, typographical errors, and separated into multiple questions to facilitate clarity in our responses.

Comments (1-10) from T&B

Comment No. 1:

We request that EPA acknowledge that the proposed copper limit is at or beyond the limit of current technology and consider a relaxation in limit, either by increasing the average monthly limit to at least 5 ug/l or by adopting a longer time basis for the limit, such as a seasonal average of 2.1 ug/l and average monthly limit of 5 ug/l.

Response No. 1:

Effluent data submitted by the permittee has frequently included effluent total copper concentrations below the 2.1 ug/l average monthly limit. Based on these discharge monitoring results, EPA is not prepared to say the total copper limits in the final permit are beyond the limit of current technology.

Extended averaging periods for limits for copper as suggested by the permittee would not be compatible with the time periods used in development of the copper criteria, and so would not ensure that the discharge does not cause or contribute to exceedances of water quality standards.

Aquatic life criteria consist of three components: magnitude (concentration of pollutant), duration (how long are the organisms exposed), and frequency (how often is the criteria exceeded).¹

EPA's aquatic life criteria for copper are predicated on the basis that aquatic organisms and their uses should not be affected unacceptably if the four-day average concentration of copper does not exceed the chronic criteria (Criterion Continuous Concentration, CCC) more than once every three years on the average and if the one-hour average concentration of copper does not exceed the acute criteria (Criterion Maximum Concentration, CMC) more than once every three years on the average.

Lengthening the possible duration and frequency of exposure of aquatic organisms to copper at or above criterion by lengthening the averaging periods to a seasonal average and a monthly average will remove two of the three key protective components of the criteria.

Similarly, increasing the monthly average limitation to 5 ug/l would not ensure that the magnitude component of the state water quality criteria was attained given the concentration of copper in the receiving water upstream of the treatment plant discharge.

Comment No. 2:

Recognizing that EPA's 2002 Recommended Water Quality Criteria for copper may be inappropriate, MassDEP has developed site specific copper water quality criteria for many receiving streams in Massachusetts. These site specific criteria have typically resulted in significantly higher copper concentration limits for discharges to these receiving streams. However, the Miller's River was not included in MassDEP's evaluation of site specific criteria, perhaps because of budget limitations or other reasons.

We request that EPA defer issuance of the extremely stringent criteria included in the draft permit until such time as MADEP completes a site specific evaluation of water quality criteria for the Millers River.

¹ Technical Support Document for Water Quality-Based Toxics Control, EPA Number: 505290001, March, 1991

Imposing the proposed limit at this time subjects the Town to an unnecessary burden that may be difficult to remove in the future due to antibacksliding provisions of the Clean Water Act.

If the permit limit cannot be relaxed, we request that the permit include a reopener provision that would allow consideration of future relaxation of the permit limit in the event of changes in the MA water quality criteria for copper.

Response No. 2:

EPA is required to include water quality-based effluent limitations using the State's current water quality standards and criteria. EPA recognizes that the State may develop site-specific criteria for this receiving water and has retained a reopener in the final permit.

Regarding antibacksliding, the effluent limitations in the permit may be made less stringent if site-specific copper criteria are adopted by the State and approved by EPA. However, the extent to which the limitations may be made less stringent would be based on the effluent copper concentrations actually achieved by the treatment plant, pursuant to the State's antidegradation policy and the Protocol for and Determination of Site Specific Copper Criteria for Ambient Waters in Massachusetts.

Comment No. 3:

Part F. of the permit requires the permittee to complete ambient monitoring of copper and phosphorus concentrations in the Millers River upstream of the WWTF and contains a provision that allows the permit to be reopened based on the results of this monitoring.

Relative to the phosphorus concentrations, we are very concerned that MADEP and EPA are basing conclusions regarding the impact of the WWTF on the Millers River on a 2002 study that was completed prior to the WWTF being upgraded. The quality of the effluent discharged from the WWTF has improved tremendously since this upgrade and the results of this study are no longer relevant and appropriate to use in the discussion of impacts of the plant's discharge to the Millers River.

Response No. 3:

As discussed in the fact sheet, a review of the upstream phosphorus data from the 2002 study indicated that the effluent phosphorus limit might need to be made more stringent in order to ensure attainment of the 1986 EPA Quality Criteria for Water "Gold Book"-recommended phosphorus criteria of 0.1 mg/l. However, rather than include a more stringent limit in the permit, EPA decided to include an upstream monitoring requirement for phosphorus in the draft permit, so that any determination regarding the need for a more stringent limit will be based on current data.

In any event, the upstream phosphorus concentration is not influenced by the discharge. EPA is not proposing to use any downstream water quality data from the 2002 study when and if it re-evaluates the need for a more stringent limitation

Comment No. 4:

Prior to considering any future modification of the phosphorus limit, MassDEP or EPA should complete an updated study of the impacts of the WWTF to the river to avoid unnecessarily imposing more stringent conditions on the permittee than required to address documented water quality impacts resulting from phosphorus discharges from the facility.

Response No. 4:

EPA and MassDEP will base any more stringent effluent limitations on the State Water Quality Criteria, effluent sampling, and upstream sampling performed by the permittee as required in Section F of the permit. EPA and MassDEP have no plans at this time to conduct ambient monitoring upstream of the Winchendon POTW. The basis for any more stringent limitations must be presented in the fact sheet supporting such limitations and will be subject to review and comment by the Town and any other interested party. Such a change in limits can only be established through appropriate permit procedures, including public notice and comment.

Comment No. 5:

We are also concerned that EPA continues to use the water quality criteria discussed in its 1986 Gold Book as the basis for establishing a phosphorous limit for the Town's discharge when the Gold Book itself notes that instream criteria can be highly variable in free flowing streams depending on a number of site specific factors. Using an instream concentration of 100 ug/l as a goal without consideration of these site specific factors can result in an unnecessary financial burden to the Town that is not supported by scientific data.

Response No. 5:

The Massachusetts Water Quality standards do not include numeric criteria for phosphorus. Rather, the standards include narrative criteria that require "unless naturally occurring, all surface water shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses...." [See 314 CMR 4.05(5)(c)]. Where a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits using one of the methods described in 40 CFR 122(d)((1)(vi), which include interpreting available information such as federal criteria and state criteria. As discussed in the fact sheet, federal criteria include the Gold Book and the more recent ecoregional criteria, which include a phosphorus criterion of 0.01 mg/l for the ecoregion in which the discharge is located.

EPA followed those procedures in establishing the limit in the draft permit, and used the limits suggested in the 2002 report. If, as described in the response to Comment No. 3, new information shows that the current limit is not sufficiently stringent, EPA may reopen the permit to propose a more stringent limit.

Any new limitations would be developed following the procedures in 40 CFR 122.44(d), which would include consideration of both Gold Book and ecoregional criteria, as well as any other pertinent information.

Comment No. 6:

We request that the EPA defer any future changes to the phosphorus limits for the Town's facility until such time as a study of the Millers River is completed that demonstrates further reduction in phosphorus discharges from the Town's treatment facility will have a quantifiable benefit to the water quality in the river.

Response No. 6:

Again, EPA and MassDEP are not aware of any formal studies of phosphorus planned for the Millers River other than effluent and ambient total phosphorus data to be collected by the permittee. The upstream data in conjunction with the effluent phosphorus and flow data will provide an accurate assessment of the total phosphorus concentration and load downstream of the Winchendon discharge. The Town may provide EPA and MassDEP with additional data they feel is relevant to the future modification of the permitted phosphorus limits.

Comment No. 7:

The copper concentration criteria calculations are based on a translator, which is used to translate from the dissolved copper WQC to the instream total copper concentration. According to the EPA Metals Translator guidance (EPA-823-B-96-001), the translator should be calculated based on site-specific data. However, in the absence of such data, the EPA has assumed an unreasonably high value for this translator. The Town has conducted preliminary testing that suggests that the correct factor is much lower. A lower factor has a significant impact on the calculations for the permit limit, perhaps even raising the toxic level such that the background concentration would be lower than the permitted level.

We request that EPA defer issuance of the extremely stringent copper concentration criteria included in the draft permit until such time as a scientifically based translator can be determined from statistically reliable site specific data. In lieu of this, we request that EPA use the data and calculations backup attached to this letter as the basis for establishing the permit limit.

Response No. 7:

According to the EPA metals translator guidance, the conversion factors in the water quality criteria may be used as reasonable worst case translators if site specific translators are not developed². These values were used by EPA in calculating the total copper limits in the permit. While the limited data recently collected by the permittee suggest that a site specific translator might provide for some relief, we do not believe that the information is sufficient to support a less stringent limit at this time.

² See page 5 footnote 6, of The Metals Translator:Guidance for Calculating a Total Recoverable Permit Limit From a Dissolved Criterion, EPA 823-B-96-007, June 1996.

If the permittee conducts a more complete analysis of the site specific translator, consistent with the available guidance, that confirms that a different translator should be used, EPA may reopen and modify the permit to include different copper limits.

Comment No. 8:

Furthermore, the copper concentration criteria are based on toxic concentration calculations that include pollutant specific factors. It appears that acute and chronic were both taken from the EPA Metals Translator guidance (EPA-823-B-96-001), but acute and chronic do not match the values given in the EPA guidance. Due to the exponential nature of the equation, these values have a profound impact on the toxic concentration calculation.

We request that EPA reexamine the factors used in the copper concentration criteria calculation, and provide documentation regarding how these factors were determined, or provide a corrected analysis using the values in the EPA Metals Translator guidance.

Response No. 8:

EPA has reviewed the calculations in the fact sheet and has determined that they are correct. The calculations were made using the equations and factors found in National Recommended Water Quality Criteria: 2002 EPA, Office of Water, Office of Science and Technology, EPA-822-R-02-047 November 2002, as required by the Massachusetts Surface Water Quality Standards [See 314 CMR 4.05(5)(e)]. See page 32 of the National Recommended Criteria for the acute and chronic factors.

The values for the acute and chronic factors used in the Metals Translator Guidance were consistent with the water quality criteria at the time it was published in 1996. However, as described above, these factors were changed in subsequent iterations of the recommended criteria.

Comment No. 9:

The draft permit utilizes thirteen WET test dilution water sample copper concentrations to calculate the background copper concentration. However, the precision of these tests is only to the nearest 1 µg/L. Since the proposed permit concentration is so low, a change of +/- 0.5 µg/L could make a significant difference on the copper concentration criteria calculation.

Response No. 9:

The minimum level (or ML) for analyzed samples determines how many significant figures may be used in calculations. Not knowing what test method was used by the laboratory conducting the analysis for copper in the upstream water samples; the permit writer used the data as presented by the permittee. One (only one) of the 13 data points (0.0063 mg/l or 6.3 ug/l) included an extra digit which was used in the background copper calculations. The following rounding convention was used:

Determine the place value needed (the "rounding digit") and look at the digit just to the right of it.

If that digit is less than 5, do not change the rounding digit but drop all digits to the right of it.

If that digit is greater than or equal to five, add one to the rounding digit and drop all digits to the right of it.

In this case 6.3 ug/l becomes 6 ug/l. Using this value, the average of all 13 data points is 6.66 ug/l which yields a higher value when rounded up to 7 ug/l.

Even if the reported values were all reduced by 0.5 mg/l, the average concentration of the values would still be greater than the recommended instream criteria, which does not allow the limit to be established using receiving water dilution, instead requiring that the effluent limit be established equal to the water quality criteria. See also Response No. 10.

Comment No. 10:

The Town has collected six data points which were analyzed to the nearest 0.1 µg/L. The median value was 1.6 µg/L. In the data and calculations backup attached to this letter, the copper concentration criteria were calculated twice, once with only the six more precise data points, and once using the median of all nineteen available data points. We request that EPA defer issuance of the stringent copper concentration criteria until such time as sufficiently precise data is available. In lieu of this, we suggest that EPA use the data and calculations backup attached to this letter. See attached to this document.

Response No. 10:

The limited data set provided in the “data and calculations backup” attachment (see Appendix A of this document) show some prospect for future modification of the total copper limits. The upstream samples collected with the quarterly whole effluent toxicity tests, however, demonstrate high background copper concentrations. Twelve of thirteen upstream samples were at or above EPA New England’s minimum level of 3.0 mg/l and must be considered valid. Those twelve samples were all above the acute and chronic criterion for total copper calculated in the Fact Sheet (2.6 ug/l and 2.1 ug/l, respectively).

Again, the “preliminary translator” for the dissolved fraction of the total recoverable concentration for copper (based on only two samples) indicates that with additional sampling data and analysis, the translator may be a basis for a modification of the total copper limitation.

If the permittee wishes to collect additional data for the purposes of supporting a site-specific translator for copper, it should submit a scope of work to EPA and MassDEP prior to conducting the sampling that conforms to the Metals Translator Guidance and identifies the number and type of samples, the flow regime(s) under which it plans to conduct the sampling, and a QA/QC plan for ensuring the quality of the data.

Comment (11) from CTDEP

Background

The draft permit authorizes the WWTP to discharge to Millers River, which drains to the Connecticut River, and subsequently to Long Island Sound (LIS). The CTDEP has an interest in discharges to waters that drain to Long Island Sound since hypoxic conditions, which occur annually in the summer, have been documented to result from excessive amounts of nitrogen. Discharges from wastewater treatment plants contribute to the nitrogen loading to LIS. In response to this occurrence, Connecticut and New York jointly developed a Total Maximum Daily Load (TMDL) for nitrogen which was approved by the Federal Environmental Protection Agency (EPA) in April, 2001. In addition to a number of nitrogen reduction efforts, the TMDL specifies a 25% reduction in the estimated nitrogen load from states upstream of Connecticut (Massachusetts, Vermont, and New Hampshire).

The draft Winchendon WWTP discharge permit demonstrates initial efforts aimed at reducing the amount of nitrogen discharged to LIS from upstream states. It includes a Special Condition for the WWTP to maintain a nitrogen load of approximately 79 pounds/day based on a 2004 and 2005 annual average and requires the WWTP permittee to conduct an evaluation of optimization methods designed to maintain this nitrogen load. The draft permit also requires the permittee to submit an annual report that outlines nitrogen removal efficiencies, documents the annual nitrogen load discharged, and tracks trends in the nitrogen load. The CTDEP is pleased that such stipulations targeted at nitrogen loading have been proposed in the draft Winchendon WWTP NPDES permit and hopes to see this Special Condition incorporated in the final version.

Also noted in the draft WWTP permit is a requirement for bi-monthly monitoring of nitrogen species based on a 24-hour composite. This type of data will serve to refine nitrogen loading estimates to LIS from upstream states and assist the Connecticut River Workgroup (EPA, NEIWPCC, CT, NY, MA, VT, NH) in determining supportable management actions.

Comment No. 11:

However, we also recommend concurrent sampling along the process or treatment chain, especially the influent. Those data will help determine treatment efficiency and, should nutrient removal be required at some time in the future for local or Long Island Sound management, they will be helpful in determining appropriate technologies and management options.

Response No. 11:

EPA believes that the monitoring in the draft permit is sufficient for the purposes of establishing the concentration and load of nitrogen discharged from the Winchendon WWTF, and does not believe that additional monitoring requirements are necessary at this time. This approach is consistent with requirements for other EPA Region 1 NPDES permits issued in Massachusetts and New Hampshire. Therefore, the nitrogen monitoring requirements in the final permit have not been changed.

It should be noted that the permittee may conduct additional nitrogen sampling in support of its evaluation of alternative operational procedures that may enhance the nitrogen removal efficiency of the facility.

Comments (12-16) from CRWC

Comment No. 12:

No locus map of the outfall was provided in the Fact Sheet. It is helpful having a map showing the discharge location.

Response No. 12:

EPA inadvertently omitted the locus map attachment from the fact sheet mailed to CRWC. The locus map was included in the posting of the draft permit on the EPA New England Web Site and may be found at: <http://www.epa.gov/region1/npdes/mass.html>

Comment No. 13:

We support the increased monitoring frequency for BOD and TSS between November 1 and May 31, and for the nitrogen compounds and total phosphorus.

Response No. 13:

These requirements are consistent with monitoring frequencies for similarly sized POTWs in Massachusetts.

Comment No. 14:

We support the lower effluent limits for copper in this draft permit. Given that this stretch of river is impaired for “unknown toxicity” it is important to be as protective as possible.

Response No. 14:

EPA and Mass DEP acknowledge CRWC’s support.

Comment No. 15:

Page 14 of the Fact Sheet states that a December 2002 study conducted by ENSR demonstrated a reasonable potential for the discharge to cause or contribute to exceedances of total phosphorus. As a result, the existing 2004 NPDES permit had a 1.0 mg/L phosphorus limit that was decreased to 0.5 mg/L as of May 1, 2006. Although Part F of the draft permit requires monthly phosphorus sampling upstream of the discharge for the next two years, we do not know if the 0.5 mg/L limit succeeded in being adequately protective of water quality these last four years. While EPA acknowledges that it considered lowering the phosphorus limits further, EPA decided not to take that step at this time “without updated background phosphorus data.” Ideally, EPA should require these data to be collected in advance of the permit. By any chance, are there instream phosphorus readings available from MassDEP, such as through their SMART program? (I ran out of time to check on this myself).

Are there known phosphorus sources upstream of the facility that are thought to be contributing to high ambient levels?

It is difficult and time-consuming to re-open a permit within the five year period, so it is best to get the most appropriate phosphorus limits established in this permit round. CRWC would like more justification for not bringing the phosphorus limit down to be more consistent with the ecoregional criteria.

Response No. 15:

EPA is not aware of any upstream phosphorus data that is more current than the information in the 2002 report. There are no SMART (Strategic Monitoring and Assessment for Riverbasin Teams) sites above the discharge. There is a SMART site below the discharge. Total phosphorus samples were collected at this site in 2005. The downstream data has not yet been reviewed for dissemination.

Regarding the comment that such data should have been collected prior to developing the draft permit, we concur that it would have been desirable to have such information at the time the draft permit was being developed, but in its absence we did not believe that delaying the development and issuance of the permit was desirable.

As described in the Response to Comment No. 5, EPA considered all available information in interpreting the state narrative criteria, including the 2002 report, the Gold Book criteria and Ecoregion criteria. EPA believes that the phosphorus limit in the permit is sufficiently stringent to ensure attainment of water quality standards, but included ambient monitoring requirements to confirm the current upstream water quality and a permit reopener in the event that new information should show that a more stringent phosphorus limit is necessary. There are no point source dischargers of phosphorus with individual permits upstream of the Winchendon discharge on the Millers River.

Comment No. 16

We are glad that the permittee has switched to ultraviolet disinfection, thereby eliminating its chlorine discharge.

Response No. 16:

EPA and Mass DEP acknowledge your comment and concur that UV disinfection is generally preferable to chlorination since it eliminates the potential for a toxic discharge of chlorine.

Appendix A

Letter Attachment from Robert Peirent, P.E, Senior Vice President, Tighe and Bond, Inc., on behalf of the Town of Winchendon

The following data were collected by the Town to supply information that was either missing or insufficiently precise in the draft permit fact sheet.

Location and Date	Hardness (mg/L)	Cu Total (mg/L)	Cu dissolved (mg/L)	dissolved %
Whitney Bridge (2 miles upstream of outfall)				
10/22/2010	9.7	0.0014	0.0011	78.6%
10/20/2010	9.2	0.0014	0.0015	100.0%
Kamenstein (1.5 miles upsteam of outfall/aquatic tox background site)				
10/22/2010	9.5	0.0024	0.0009	37.5%
10/20/2010	9.2	0.0009	0.0009	100.0%
100 yards Upstream of Outfall				
10/22/2010	10	0.0017	0.0009	52.9%
10/20/2010	9.8	0.0024	0.0017	70.8%
Effluent				
10/22/2010	38	0.0028	0.002	71.4%
10/20/2010	40	0.0025	0.0022	88.0%
1 mile Downstream of Outfall				
10/22/2010	10	0.0014	0.0009	64.3%
10/20/2010	9.8	0.0014	0.001	71.4%

In the following discussion, we recalculate the copper concentration criteria based on the process followed by the draft permit fact sheet and the EPA Metals Translator³ guidance.

³ EPA Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion (EPA-823-B-96-001)

Step 1: Calculate the dissolved copper toxic concentration downstream

Guiding Equation:

$$WQC_{dissolved} = e^{(m \cdot \ln(\text{hardness} + b))} \times CF$$

Calculated Values:

$$WQC_{dissolved}(\text{acute}) = 3.13 \frac{\mu\text{g}}{\text{L}}$$

$$WQC_{dissolved}(\text{chronic}) = 2.43 \frac{\mu\text{g}}{\text{L}}$$

Variables:

WQC = Water Quality Criteria = dissolved copper toxic concentration

$m_{\text{acute}} = 0.9422$ = pollutant specific coefficient (slope)

$m_{\text{chronic}} = 0.8545$ = pollutant specific coefficient (slope)

These are from the EPA Metals Translator guidance. These values agree with the values used in the Winchendon fact sheet.

$b_{\text{acute}} = -1.464$ = pollutant specific coefficient (y-intercept)

$b_{\text{chronic}} = -1.465$ = pollutant specific coefficient (y-intercept)

These are from the EPA Metals Translator guidance. These values do not agree with those used in the Winchendon fact sheet. EPA does not give any site-specific data which would justify the use of a different coefficient.

hardness = 16.6 mg/L = downstream hardness based on EPA data

CF = 0.96 = conversion factor

Step 2: Calculate the total toxic concentration limit downstream

Guiding Equation:

$$C_{\text{instream}} = WQC_{dissolved} \cdot \frac{1}{f_D}$$

Calculated Values:

$$C_{\text{instream}}(\text{acute}) = 4.62 \frac{\mu\text{g}}{\text{L}}$$

$$C_{\text{instream}}(\text{chronic}) = 3.61 \frac{\mu\text{g}}{\text{L}}$$

Variables:

C_{instream} = the total recoverable copper concentration that corresponds with the dissolved toxic concentration.

$f_D = 67.9\%$ = the “translator”, or the dissolved fraction of the total recoverable concentration at the site specific instream chemical conditions

Discussion:

Following the process in the EPA metals guidance, this is the point where site specific instream chemistry should be accounted for by field measurements. At this point, the Winchendon fact sheet states, "In the absence of site specific data on how a particular discharge partitions in the receiving water, a default assumption that the translator is equivalent to the criteria conversion factor is used in accordance with the Translator Guidance." Based on tests conducted by the Town to determine this factor, a preliminary estimate of the translator is 67.9%, based on two data points collected downstream of the effluent location.

Step 3: Calculate the background copper concentration

Discussion:

The draft permit utilizes thirteen WET test dilution water sample copper concentrations to calculate the background copper concentration. However, the precision of these tests is only to the nearest 1 µg/L. Since the proposed permit concentration is so low, a change of +/- 0.5 µg/L could make a significant difference on the copper concentration criteria calculation.

The above table presents data that the Town has collected. The data includes six points upstream of the outfall. All six points were analyzed for total copper to the nearest 0.1 µg/L.

Calculations:

Median total copper concentration including Whitney Bridge, Kamenstein, and Upstream of Outfall:
= 1.55 µg/L.

Median total copper concentration including above plus all WET points utilized in the draft permit:
= 3.0 µg/L.

Step 4: Calculate the allowable effluent concentration

Guiding Equation:

$$WLA = \frac{C_{instream} \cdot (Q_r + Q_e) - Q_e C_e}{Q_e}$$

Variables:

WLA = Waste Load Allocation = permissible waste load resulting in C_{instream} concentration

Q_e = 1.1 MGD = design wastewater flow

Q_s = 3.9 MGD = 7Q10 upstream flow

C_s = 1.55 $\mu\text{g/L}$ = background copper concentration (using only high-precision data)

C_s = 3.0 $\mu\text{g/L}$ = background copper concentration (using all available data)

Calculated Values assuming 1.55 $\mu\text{g/L}$ background concentration:

$$WLA(\text{acute}) = 13.3 \frac{\text{MG}}{\text{L}}$$

$$WLA(\text{chronic}) = 10.9 \frac{\text{MG}}{\text{L}}$$

Calculated Values assuming 3.0 $\mu\text{g/L}$ background concentration:

$$WLA(\text{acute}) = 10.4 \frac{\text{MG}}{\text{L}}$$

$$WLA(\text{chronic}) = 5.8 \frac{\text{MG}}{\text{L}}$$