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 Barre
Board of Sewer Commissioners

is authorized to discharge from the facility located at

Barre Wastewater Treatment Plant
411 Wheelright Road
Barre, MA 01005

to receiving water named

Ware River

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 following sixty (60) days after signature.

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

This permit supersedes the permit issued on November 16, 2005.

This permit consists of 15 pages in Part I including effluent limitations and monitoring requirements, 25 pages in Part II including Standard Conditions, Attachment A – 2007 Chronic Whole Effluent Toxicity Test Protocol, and Attachment B - Summary of Required Reports.

Signed this 26th day of March, 2013.

/S/ SIGNATURE ON FILE

Ken Moraff, Acting Director	David Ferris, Director
Office of Ecosystem Protection	Massachusetts Wastewater Management Program
Environmental Protection Agency	Department of Environmental Protection
Boston, MA	Commonwealth of Massachusetts

PART I

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Ware River. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	**EFFLUENT LIMITS**					**MONITORING REQUIREMENTS [3]**	
PARAMETER	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**AVERAGE MONTHLY**	**AVERAGE WEEKLY**	**MAXIMUM DAILY**	**MEASUREMENT FREQUENCY**	**SAMPLE[3] TYPE**
FLOW[2]	*********	*********	0.30 MGD	*********	Report MGD	CONTINUOUS	RECORDER
FLOW	*********	*********	Report MGD	*********	*********	CONTINUOUS	RECORDER
BOD_5[4]	75 lbs/Day	113 lbs/Day	30 mg/l	45 mg/l	Report mg/l	1/WEEK	24-HOUR COMPOSITE[5]
TSS [4]	75 lbs/Day	113 lbs/Day	30 mg/l	45 mg/l	Report mg/l	1/WEEK	24-HOUR COMPOSITE[5]
AMMONIA-NITROGEN[6]	*********	*********	Report mg/l	*********	Report mg/l	1/WEEK	24-HOUR COMPOSITE[5]
pH RANGE[1]	6.5 - 8.3 SU (SEE PERMIT PAGE 6 OF 15, PARAGRAPH I.A.1.b.)					1/DAY	GRAB
ESCHERICHIA COLI [1,7] (April 1st - October 31st)	*********	**********	126 cfu/100 ml	*********	409 cfu/100 ml	1/WEEK	GRAB
TOTAL PHOSPHORUS April 1st – October 31st November 1st – March 31st	 Report lbs/Day Report lbs/Day	 ********* *********	 0.9 mg/l 1.0 mg/l	 ********* *********	 Report mg/l Report mg/l	1/WEEK	GRAB

CONTINUED FROM PREVIOUS PAGE

A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge from treated effluent from outfall serial number **001** to the Ware River. Such discharges shall be limited and monitored as specified below.

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS					MONITORING REQUIREMENTS [3]	
PARAMETER	AVERAGE MONTHLY	AVERAGE WEEKLY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	MEASUREMENT FREQUENCY	SAMPLE[3] TYPE
TOTAL KJELDAHL NITROGEN[4]	Report lbs/Day	********* *********	Report mg/l	********* *********	Report mg/l	1/MONTH	24-HOUR COMPOSITE[5]
NITRATE & NITRITE NITROGEN[4]	Report lbs/Day	********* *********	Report mg/l	********* *********	Report mg/l	1/MONTH	24-HOUR COMPOSITE[5]
TOTAL COPPER[8,9]	*********	*********	2.5 µg/l	*********	3.2 µg/l	1/MONTH	24-HOUR COMPOSITE[5]
TOTAL ALUMINUM[10]	*********	*********	87 µg/l	*********	Report µg/l	1/MONTH	24-HOUR COMPOSITE[5]
WHOLE EFFLUENT TOXICITY [11,12,13,14] Acute LC_{50} Chronic C-NOEC	≥ 100% Report					4/YEAR	24-HOUR COMPOSITE[5]
	Effluent		Dilution Water				
Total Residual Chlorine[15]	Report maximum daily, µg/l		Report maximum daily, µg/L				
Total Hardness[15]	Report maximum daily, mg/l		Report maximum daily, mg/l				
Total Cadmium[15]	Report maximum daily, µg/l		Report maximum daily, µg/l				
Total Lead [15]	Report maximum daily, µg/l		Report maximum daily, µg/l				
Total Copper[15]	Report maximum daily, µg/l		Report maximum daily, µg/l				
Total Zinc[15]	Report maximum daily, µg/l		Report maximum daily, µg/l				
Total Nickel[15]	Report maximum daily, µg/l		Report maximum daily, µg/l				
Total Aluminum[15]	Report maximum daily, µg/l		Report maximum daily, µg/l				

Footnotes:

1. Required for State Certification.

2. 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.

3. All samples shall be representative of the discharge.

   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.

4. Sampling required for influent and effluent.

5. 24-hour composite samples will consist of at least twenty four (24) grab samples taken during one consecutive 24 hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow.

6. Please see Section I.E.2. for special conditions regarding ammonia.

7. The monthly average limit for *E. coli* is expressed as a geometric mean.

8. Copper limits will become effective 48 months after the effective date of the permit. In the interim, the permittee shall submit progress reports every 12 months describing progress made towards attaining the limits during the previous 12 months. The first report shall be submitted one year following the effective date of the permit, and subsequent reports shall be submitted annually on that date. Effluent monitoring requirements are in effect upon the effective date of the permit.

9. The minimum level (ML) for copper is defined as 0.5 µg/l. Total copper analysis shall be performed using EPA Method 200.8 ICP/MS – inductively coupled plasma spectrometry, as this is the only approved method under 40 CFR Part 136 that provides a minimum level of detection (0.5 µg/l) in the range of the permit limits. Sampling results of 0.5 µg/l or less shall be reported as zero on the Discharge Monitoring Report.

10. The monthly composite aluminum sample shall be taken on the same day as one of the weekly phosphorus samples.

Aluminum limits will become effective 48 months after the effective date of the permit. In the interim, the permittee shall submit progress reports every 12 months describing progress made towards attaining the limits during the previous 12 months. The first report shall be submitted one year following the effective date of the permit, and subsequent reports shall be submitted annually on that date. Effluent monitoring requirements are in effect upon the effective date of the permit.

In the event that subsequent sampling shows that aluminum concentrations in the Ware River and in the discharge are less than the chronic criteria, the permittee may request a modification of the effluent limit. At least four instream samples and twelve effluent samples (one year of data) would be the minimum number of samples necessary to support such a modification request.

11. The permittee shall conduct acute and chronic toxicity tests four times per year. The chronic test may be used to calculate the acute LC_{50} at the 48 hour exposure interval. The permittee shall test the daphnid, *Ceriodaphnia dubia*, only. 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_{50}**	**Chronic Limit C-NOEC**
February May August November	March 31 June 30 September 30 December 31	Ceriodaphnia dubia (daphnid)	≥100%	Report

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.

12. The LC_{50} is the concentration of effluent that 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.

13. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction, based on a statistically

significant difference from dilution control, at a specific time of observation as determined from hypothesis testing. Under the NPDES program, as indicated in the EPA WET Method Manual EPA 821-R-02-013, Section 10.2.6.2, all test results are to be reviewed and reported in consultation with EPA guidance on the evaluation of the concentration-response relationship.

14. 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** 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 in Attachment G of *NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs)*, which may be 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**.

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

Part I.A.1. (Continued)

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 or greater than 8.3 at any time.

c. The discharge shall not cause objectionable discoloration of the receiving waters.

d. The effluent shall not contain a visible oil sheen, foam, or 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 percent of the facility's design flow (0.24 MGD), the permittee shall submit a report to MassDEP by March 31 of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions.

h. The use of chlorine is prohibited.

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

a. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; 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.

3. Prohibitions Concerning Interference and Pass Through:

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

4. 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.

5. 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.

B. UNAUTHORIZED DISCHARGES

This permit authorizes discharges only from the outfall(s) listed in Part I A.1.of this permit, in accordance with the terms and conditions 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).

Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes DEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at http://www.mass.gov/dep/water/approvals/surffms.htm#sso.

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

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

1. Maintenance Staff

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

2. Preventive Maintenance Program

   The permittee shall maintain an ongoing preventive 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. Plans and programs to meet this requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

3. Infiltration/Inflow

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

4. Collection System Mapping

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

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

5. Collection System Operation and Maintenance Plan

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

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

(1) A description of the collection system management goals, staffing, information management, and legal authorities;
(2) A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities; and
(3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in paragraphs b.1. through b.8. below.

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

(1) The required submittal from paragraph 5.a. above, updated to reflect current information;
(2) A preventive maintenance and monitoring program for the collection system;
(3) Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;
(4) Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;
(5) Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
(6) A description of the permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts; and
(7) An educational public outreach program for all aspects of I/I control, particularly private inflow.
(8) An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. The report shall be submitted to EPA and MassDEP annually by March 31. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;
b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;
c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
d. A map with areas identified for investigation/action in the coming year;
e. If treatment plant flow has reached 80% of the design flow (0.24 MGD) or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and
f. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit.

7. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall provide an alternative power source(s) sufficient to operate the portion of the publicly owned treatment works[1] it owns and operates.

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 including 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 C.F.R. 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

[1] As defined at 40 CFR §122.2, which references the definition at 40 CFR §403.3

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.[2]

6. Where 40 C.F.R. Part 503 applies, the sludge shall be monitored for pollutant concentrations (all Part 503 methods) and 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 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	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. 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.

[2] 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

E. SPECIAL CONDITIONS

1. Optimizing Nitrogen Removal Efficiency - Within **one year of the effective date of the permit**, 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 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 to maintain the mass discharge of total nitrogen less than the existing annual average discharge load. The baseline annual average total nitrogen load from this facility (2004-2005) is estimated to be 63 lbs/day.

   The permittee shall also submit an annual report to EPA and MassDEP, **by February 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.

2. Developing and Implementing a Maximum Allowable Industrial Headworks Loading for Ammonia - Within **120 days of the effective date of this permit**, the permittee shall develop and submit to EPA, a Maximum Allowable Industrial Headworks Loading (MAIHL) for ammonia. The proposed MAIHL should be submitted to EPA for review and approval in accordance with 40 CFR 403.18(c). Upon EPA's approval the MAIHL shall be adopted, immediately, into the Town's Sewer Use Ordinance.

F. MONITORING AND REPORTING

The permittee shall submit monitoring data and all other NPDES permit required reports to EPA 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. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

1. Submittal of Reports Using NetDMR

   NetDMR is accessed from: http://www.epa.gov/netdmr. 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. A permittee submitting reports using NetDMR is no longer required to submit hard copies of DMRs or other reports to EPA and no longer 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, Toxicity Test Results and Nutrient Optimization Reports) to MassDEP until further notice from MassDEP.

2. Submittal of Reports in Hard Copy Form

   While we do not anticipate the need for the permittee to submit hard copies of reports to EPA, any hard copies that are submitted to EPA shall be submitted to the Director at the following address:

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

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

Massachusetts Department of Environmental Protection
Central Regional Office
Bureau of Resource Protection
627 Main Street
Worcester, Massachusetts 01608

Toxicity test reports, copper and aluminum progress reports, and nitrogen optimization reports, shall also be submitted to the State at the following address:

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

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

G. 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.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

TABLE OF CONTENTS

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

Note: See 40 CFR §122.41(a)(2) for complete "Duty to Comply" regulations.

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Regional Administrator, upon request, copies of records required to be kept by this permit.

4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including "sludge-only facilities"), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

a. In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or permittee;
(2) Permit applications, permits, and effluent data as defined in 40 CFR §2.302(a)(2).

c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can be reasonably expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of Paragraphs B.4.c. and 4.d. of this section.

c. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
(3) i) The permittee submitted notices as required under Paragraph 4.c. of this section.
ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

5. Upset

a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated;
(3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
(4) The permittee complied with any remedial measures required under B.3. above.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records for monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

e. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by

imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The permittee shall allow the Regional Administrator or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. Planned Changes. The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
(2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. Anticipated noncompliance. The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. Transfers. This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

incorporate such other requirements as may be necessary under the CWA. (See 40 CFR Part 122.61; in some cases, modification or revocation and reissuance is mandatory.)

d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. Twenty-four hour reporting.

(1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

(3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.

h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and Federal standards and limitations to which a “discharge”, a “sewage sludge use or disposal practice”, or a related activity is subject to, including “effluent limitations”, water quality standards, standards of performance, toxic effluent standards or prohibitions, “best management practices”, pretreatment standards, and “standards for sewage sludge use and disposal” under Sections 301, 302, 303, 304, 306, 307, 308, 403, and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in "approved States", including any approved modifications or revisions.

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" measured during the calendar week divided by the number of "daily discharges" measured during the week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Best Professional Judgment (BPJ) means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

Coal Pile Runoff means the rainfall runoff from or through any coal storage pile.

Composite Sample means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

Construction Activities - The following definitions apply to construction activities:

(a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

(b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.

(c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

(d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

Daily Discharge means the discharge of a pollutant measured during the calendar day or any other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Director normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

Discharge Monitoring Report Form (DMR) means the EPA standard national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source", or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation (See "Point Source" definition).

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead

to a treatment works; and discharges through pipes, sewers, or other conveyances leading into privately owned treatment works.

This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Regional Administrator on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States", the waters of the "contiguous zone", or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under Section 304(b) of CWA to adopt or revise "effluent limitations".

EPA means the United States "Environmental Protection Agency".

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample – An individual sample collected in a period of less than 15 minutes.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Indirect Discharger means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

Interference means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act (CWA), the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized

populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

Maximum daily discharge limitation means the highest allowable "daily discharge" concentration that occurs only during a normal day (24-hour duration).

Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO) is defined as "maximum concentration" or "Instantaneous Maximum Concentration" during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean "a value that shall not be exceeded" during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of "Maximum Daily Discharge" and "Average Daily Discharge" concentrations are specifically limited to the daily (24-hour duration) values.

Municipality means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribe organization, or a designated and approved management agency under Section 208 of the CWA.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program".

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants";

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source"; and

(d) Which has never received a finally effective NPDES permit for discharges at that "site".

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore rig or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Regional Administrator in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Regional Administrator shall consider the factors specified in 40 CFR §§125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants", the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System".

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved" State.

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 CFR §122.2).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. §§2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (Natural Resources Defense Council et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12 E.R.C. 1833 (D. D.C. 1979)); also listed in Appendix A of 40 CFR Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (b) not a "POTW".

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly Owned Treatment Works (POTW) means any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality".

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary Industry Category means any industry which is not a "primary industry category".

Section 313 water priority chemical means a chemical or chemical category which:

(1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);

(2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and

(3) satisfies at least one of the following criteria:

(i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
(ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
(iii) are pollutants for which EPA has published acute or chronic water quality criteria.

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets, raw materials used in food processing or production, hazardous substance designated under section 101(14) of CERCLA, any chemical the facility is required to report pursuant to EPCRA Section 313, fertilizers, pesticides, and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to Section 405(d) of the CWA, and is required to obtain a permit under 40 CFR §122.1(b)(3).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

Storm Water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

Time-weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

Toxic pollutants means any pollutant listed as toxic under Section 307 (a)(1) or, in the case of "sludge use or disposal practices" any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and wastewater from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR Part 503 as a "treatment works treating domestic sewage", where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 CFR Part 503.

Waste Pile means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in Paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

Active sewage sludge unit is a sewage sludge unit that has not closed.

Aerobic Digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

Agricultural Land is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

Agronomic rate is the whole sludge application rate (dry weight basis) designed:

(1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and

(2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

Air pollution control device is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

Annual pollutant loading rate is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

Annual whole sludge application rate is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

Apply sewage sludge or sewage sludge applied to the land means land application of sewage sludge.

Aquifer is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

Base flood is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

Bulk sewage sludge is sewage sludge that is not sold or given away in a bag or other container for application to the land.

Contaminate an aquifer means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 122.2,

classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved state programs, the Regional Administrator in conjunction with the State Director, because of the potential for sewage sludge use or disposal practice to affect public health and the environment adversely.

Control efficiency is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

Cover is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

Cover crop is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

Cumulative pollutant loading rate is the maximum amount of inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

Dispersion factor is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

Displacement is the relative movement of any two sides of a fault measured in any direction.

Domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Domestic sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

Fault is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

Final cover is the last layer of soil or other material placed on a sewage sludge unit at closure.

Fluidized bed incinerator is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

Forest is a tract of land thick with trees and underbrush.

Ground water is water below the land surface in the saturated zone.

Holocene time is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

Hourly average is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Industrial wastewater is wastewater generated in a commercial or industrial process.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

Land with low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

Leachate collection system is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

Liner is soil or synthetic material that has a hydraulic conductivity of 1×10^{-7} centimeters per second or less.

Lower explosive limit for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

Monthly average (Incineration) is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

Monthly average (Land Application) is the arithmetic mean of all measurements taken during the month.

Municipality means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management agency under section 208 of the CWA, as amended. The definition includes a special district created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

Other container is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

Pasture is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permitting authority is either EPA or a State with an EPA-approved sludge management program.

Person is an individual, association, partnership, corporation, municipality, State or Federal Agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration; a measure of the acidity or alkalinity of a liquid or solid material.

Place sewage sludge or sewage sludge placed means disposal of sewage sludge on a surface disposal site.

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination or organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis on information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

Pollutant limit (for sludge disposal requirements) is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

Public contact site is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

Qualified ground water scientist is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

Range land is open land with indigenous vegetation.

Reclamation site is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

Risk specific concentration is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

Runoff is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

Seismic impact zone is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to:, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in treatment works.

Sewage sludge feed rate is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 CFR §122.2.

Sewage sludge unit boundary is the outermost perimeter of an active sewage sludge unit.

Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

Stack height is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

State is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Total hydrocarbons means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Treat or treatment of sewage sludge is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

Unstable area is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Wet electrostatic precipitator is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

Wet scrubber is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen
kg/day	Kilograms per day
lbs/day	Pounds per day
mg/l	Milligram(s) per liter
ml/l	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
Surfactant	Surface-active agent

Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
ug/l	Microgram(s) per liter
WET	"Whole effluent toxicity" is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	"Chronic (Long-term Exposure Test) – No Observed Effect Concentration". The highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.
A-NOEC	"Acute (Short-term Exposure Test) – No Observed Effect Concentration" (see C-NOEC definition).
LC_{50}	LC_{50} is the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

FRESHWATER CHRONIC
TOXICITY TEST PROCEDURE AND PROTOCOL
USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic (and modified acute) toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**

- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic and modified acute toxicity data shall be reported as outlined in Section VIII. The chronic fathead minnow and daphnid test data can be used to calculate an LC50 at the end of 48 hours of exposure when both acute (LC50) and chronic (C-NOEC) test endpoints are specified in the permit.

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition. October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at http://www.epa.gov/waterscience/WET/ . Exceptions and clarification are stated herein.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6^{o} C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2,Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
One Congress St., Suite 1100
Boston, MA 02114-2023

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
One Congress Street, Suite 1100
Boston, MA 02114-2023

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.1. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥3 standard deviations for IC25s and LC50 values and ≥ two concentration intervals for NOECs or NOAECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids[6]	x		--
Total Dissolved Solids[6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon[6]	x	x	0.5
Total Metals[5]			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 2340B (hardness by calculation)
  -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
  -Method 4500-CL E Low Level Amperometric Titration
  -Method 4500-CL G DPD Colorimetric Method
- USEPA 1983. Manual of Methods Analysis of Water and Wastes
  -Method 330.5

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013. Guidance for this review can be found at http://www.epa.gov/waterscience/methods/wet/pdf/wetguide.pdf . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value**,** for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.

- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater that the PMSD lower bound, then the treatment is considered statistically significant.

- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
  - Facility name
  - NPDES permit number
  - Outfall number
  - Sample type
  - Sampling method
  - Effluent TRC concentration
  - Dilution water used
  - Receiving water name and sampling location
  - Test type and species
  - Test start date
  - Effluent concentrations tested (%) and permit limit concentration
  - Applicable reference toxicity test date and whether acceptable or not
  - Age, age range and source of test organisms used for testing
  - Results of TAC review for all applicable controls
  - Test sensitivity evaluation results (test PMSD for growth and reproduction)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

Summary of Required Report Submittals*

Required Report	Date Due	Submitted by:	Submitted to:
Whole Effluent Toxicity Test Report (Part I.A.1)	March 31, June 30, September 30, and December 31 of each year	Barre WWTP	Via NetDMR Or Environmental Protection Agency Water Technical Unit 5 Post Office Square, Suite 100 (OES04-4) Boston, MA 02109-3912
			MassDEP Division of Watershed Management Surface Water Discharge Permit Program 627 Main Street, 2nd Floor Worcester, MA 01608
Copper and Aluminum Progress Reports (Part I.A.1. Footnotes 8 & 10)	Within 12 months of effective date of permit and annually until 48 months after permit effective date	Barre WWTP	Via NetDMR Or Environmental Protection Agency Water Technical Unit 5 Post Office Square, Suite 100 (OES04-4) Boston, MA 02109-3912
			MassDEP Division of Watershed Management Surface Water Discharge Permit Program 627 Main Street, 2nd Floor Worcester, MA 01608 MassDEP Bureau of Resource Protection Central Regional Office 627 Main Street, 2nd Floor Worcester, MA 01608

Required Report	Date Due	Submitted by:	Submitted to:
Initial Collection System Operation and Maintenance Plan (Part I.C.5.a.)	Within 6 months of effective date	Barre WWTP	Via NetDMR Or U.S. Environmental Protection Agency Water Technical Unit 5 Post Office Square, Suite 100 (OES04-4) Boston, MA 02109-3912
			MassDEP Bureau of Resource Protection Central Regional Office 627 Main Street, 2nd Floor Worcester, MA 01608
Full Collection System Operations and Maintenance Plan (Part I.C.5.b.)	Two years from the effective date of the permit	Barre WWTP	Via NetDMR Or U.S. Environmental Protection Agency Water Technical Unit 5 Post Office Square, Suite 100 (OES04-4) Boston, MA 02109-3912
			MassDEP Bureau of Resource Protection Central Regional Office 627 Main Street, 2nd Floor Worcester, MA 01608
Collection System Annual Report (Part I.C.6.)	Annually by March 31	Barre WWTP	Via NetDMR Or U.S. Environmental Protection Agency Water Technical Unit 5 Post Office Square, Suite 100 (OES04-4) Boston, MA 02109-3912

Required Report	Date Due	Submitted by:	Submitted to:
			MassDEP Bureau of Resource Protection Central Regional Office 627 Main Street, 2nd Floor Worcester, MA 01608
Notification of Sanitary Sewer Overflows (Part I.B.)	Oral Report -Within 24 hours of discovery of event (Contact: Douglas Koopman, 617.918.1774) Written Report – Within 5 calendar days of discovery of event	Barre WWTP	U.S. Environmental Protection Agency Water Technical Unit 5 Post Office Square, Suite 100 (OES04-4) Boston, MA 02109-3912
			MassDEP Bureau of Resource Protection Central Regional Office 627 Main Street, 2nd Floor Worcester, MA 01608
Annual Sludge Report (Part I.D.8)	Annually by February 19	Barre WWTP	Via NetDMR or U.S. Environmental Protection Agency Water Technical Unit 5 Post Office Square, Suite 100 (OES04-4) Boston, MA 02109-3912
			MassDEP Bureau of Resource Protection Central Regional Office 627 Main Street, 2nd Floor Worcester, MA 01608

Required Report	Date Due	Submitted by:	Submitted to:
Maximum Allowable Industrial Headworks Loading (MAIHL), Section I.E.2.	120 days after effective date of permit	Barre WWTP	MassDEP Bureau of Resource Protection Central Regional Office 627 Main Street, 2nd Floor Worcester, MA 01608 U.S. Environmental Protection Agency Water Technical Unit 5 Post Office Square, Suite 100 (OES04-4) Boston, MA 02109-3912

* 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.

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

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES PURSUANT TO THE CLEAN WATER ACT (CWA)

NPDES PERMIT NUMBER: MA0103152

PUBLIC NOTICE START AND END DATES: February 3, 2012 thru March 3, 2012

NAME AND MAILING ADDRESS OF APPLICANT:

Board of Sewer Commissioners
Town of Barre
441 Wheelright Road
Barre, MA 01005

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Barre Wastewater Treatment Plant
441 Wheelright Road
Barre, Massachusetts 01005

RECEIVING WATER(S):

Ware River (Segment MA 36-04)
Chicopee River Basin

RECEIVING WATER CLASSIFICATION(S): B - Warm Water Fishery

Table of Contents

Figures

Appendices

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

The facility's discharge outfalls are listed below:

Outfall	Description of Discharge	Receiving water	Outfall Location
001-A	Treated Effluent	Ware River	42º 22' 35" N 72° 6' 52" W

The above named applicant has applied to the U.S. Environmental Protection Agency ("EPA") for the reissuance of its NPDES permit to discharge into the designated receiving waters. The facility collects and treats domestic wastewater, septage, and industrial wastewater. The discharge from this secondary wastewater treatment facility is via Outfall 001-A to the Ware River (See Figure 1 – Facility Location Map).

The Town of Barre Wastewater Treatment Plant (WWTP) is a 0.3 million gallon per day (MGD) secondary wastewater treatment facility located in Barre, Massachusetts, serving a population of about 3,000. There are currently two industrial users contributing wastewater to this facility: Waste Management, which contributes landfill leachate, and Chas. Allen, a machine shop (see Section 7, Pretreatment).

The collection system is 100% separate sanitary sewers.

2. Description of Discharge

A quantitative description of the discharge based on recent monitoring data from January 2008 through August 2010 is shown in Appendix A.

3. Receiving Water Description

3.1 Designated Use

The Ware River is a Class B (Warm Water Fishery) waterbody. The Massachusetts Surface Water Quality Standards (314 CMR 4.05(3)(b)) state that Class B waters shall have the following designated uses:

"These waters are designated as a habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. Where designated in 314 CMR 4.06, they shall be suitable as a source of public water supply with appropriate treatment ("Treated Water Supply"). Class B waters shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value."

The Chicopee River Basin 2003 Water Quality Assessment Report indicates that the river segment receiving the Barre Wastewater Treatment Plant's discharge is attaining its uses for aquatic life with other uses not assessed. This river segment does not appear on the Massachusetts Year 2010 Integrated List of Waters [Clean Water Act, Section 303(d) list] as requiring a TMDL. The 2003

assessment noted elevated phosphorus levels and characterized the reach as impounded due to Wheelwright Dam, which is at the downstream end of the segment. The segment downstream (Segment 36-05, from the Wheelwright Dam to the Ware Dam) is listed as impaired and requiring a TMDL for *E. coli*.

The limits in the draft permit are based on information in the application, the existing permit, discharge monitoring reports, and a site visit.

3.2 Flow and Dilution Factor

The design flow of the facility is 0.3 MGD (0.46 cfs) and is unchanged since issuance of the current permit.

In reviewing the permit application and developing the draft permit, EPA became aware that the dilution factor used to develop the limits in the current permit may not be protective of water quality standards because the 7Q10 estimate of 13.06 cfs was too high. The gage used to develop the 7Q10 in the current permit (USGS 01173500 Ware River at Gibbs Crossing, MA) is located approximately 14 miles downstream of the Barre WWTP and has a drainage area of 197 square miles, compared to a drainage area of 115 square miles at the Barre WWTP. USGS 01173000 (Ware River at Intake Works near Barre, MA) is approximately 4 miles upstream of Barre WWTP and has a drainage area of 96 square miles. EPA calculated the 7Q10 and 30Q10 (see Appendix C) based on the flow at USGS gage 01173000 plus flow from the 19 square miles between the gage and the Barre outfall. This flow was calculated as follows:

7Q10 at USGS 011723000, Ware River at Intake Works Near Barre, MA = 5.84 cfs
Drainage Area = 96.3 square miles

7Q10 at USGS 01173500, Ware River at Gibbs Crossing, MA = 15.8 cfs
Drainage Area = 197 square miles

Flow factor for area between USGS 01173000 and USGS01173500 =

(15.8 cfs – 5.8 cfs)/(197 sq. mi. – 96.3 sq. mi.) = 9.96 cfs/100.7 sq. mi. = 0.100 cfs/sq. mi.

Drainage Area at Outfall = 115 square miles

7Q10 = 5.84 cfs + 0.100 cfs/square miles x (115 sq. mi. – 96.3 sq. mi.) = **7.71 cfs**

Barre WWTP design flow = 0.3 MGD x 1.53 cfs/MGD = 0.46 cfs

Dilution Factor = (Facility Flow + 7Q10)/7Q10
Dilution Factor = (7.71 cfs + 0.46 cfs)/0.46 cfs = **17.8**

4. Limitations and Conditions

The effluent limitations of the draft permit, the monitoring requirements, and any implementation schedule (if required) may be found in the draft permit.

5. Permit Basis: Statutory and Regulatory Authority

The Clean Water Act (CWA or the Act) prohibits the discharge of pollutants to waters of the United States without an NPDES permit unless such a discharge is otherwise authorized by the Act. An NPDES permit is used to implement technology based and water quality based effluent limitations as well as other requirements including monitoring and reporting. This draft NPDES permit was developed in accordance with statutory and regulatory authorities established pursuant to the Act. The regulations governing the NPDES program are found in 40 CFR Parts 122, 124 and 125.

Under Section 301(b)(1)(B) of the CWA, publicly owned treatment works (POTWs) had to achieve effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements are set forth in 40 CFR Part 133. The regulations describe the secondary treatment requirements for biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. The average monthly and average weekly BOD_5 and TSS limitations are based on the requirements of 40 CFR §133.102. Numerical limitations for pH and *E. coli* are based on state certification requirements under Section 401(a)(1) of the CWA as described in 40 CFR §124.53 and state water quality standards in 314 CMR 4.05 (b) 3 and 4, respectively.

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, 314 CMR 4.00, include 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.

The permit must also limit any pollutant or pollutant parameter (conventional, non-conventional toxic, and whole effluent toxicity) that is or may be discharged at a level that causes, or has reasonable potential to cause or contribute to an excursion above any water quality criterion [40 CFR §122.44(d)(1)]. 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.

Also note that according to EPA regulations 40 CFR §122.44(l), when a permit is reissued, effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards or conditions in the previous permit, unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued. Additionally, MassDEP has developed and adopted a statewide antidegradation policy to maintain and protect existing in-stream water quality. The Massachusetts Antidegradation Provisions are found at 314 CMR 4.04. No lowering of water quality is allowed, except in accordance with the antidegradation provisions.

The limits in the draft permit are based upon information in the application, the existing permit, a site visit, discharge monitoring reports, and toxicity test results.

6. Explanation of the Permit's Effluent Limitation(s)

6.1 Facility Information

The Town of Barre Wastewater Treatment Plant is a secondary treatment facility. It is designed for an average daily flow of 0.30 MGD. Peak hydraulic capacity is 1.15 MGD. Please see Figure 2 for a facility schematic.

Wastewater is directed to the facility through a separate sanitary sewer collection system with the assistance of pump stations. The facility also receives septage delivered by truck. Septage that enters the facility is accepted through a septage receiving area where it is stored and aerated for a period of time, usually 24 hours, and then gradually pumped to the headworks to be treated.

Flow into the facility enters through an open channel of the headworks, where the influent composite sampler (Isco FR6712) is located and where daily grab samples are taken. There is currently no influent flow meter. Installation of an influent flow meter, while not required by EPA, would help plant operators regulate chemical dosage and process flow rates.

Flow then passes through the Grit King mechanical grit removal system and then through a channel monster grinder and an auger monster to remove large debris and wash the organics off the captured debris. Poly Aluminum Chloride is added to for phosphorus removal. Grit and other solids removed from the system are disposed with sludge at the local landfill.

Following grit and coarse solids removal, the wastewater then travels to a 60,000 gallon tank that has been set up as an anoxic zone for denitrification. Hydrated lime is added to this tank to maintain alkalinity and pH. The tank is constantly mixed. A portion of the return activated sludge is also pumped to this tank to assist with denitrification.

The wastewater then flows to a second 60,000 gallon equalization tank where flow is regulated by level transducers and pumps operated through a supervisory control and data acquisition (SCADA) system to maintain an even flow over a twenty four hour period.

From the equalization tank, wastewater then passes through a parshall flume where measurements are sent back to the SCADA system. Flow then enters the oxidation ditches through the distribution box where flow is equally split between the two ditches.

In the oxidation ditches, wastewater is mixed with return activated sludge. It is aerated to maintain a dissolved oxygen level of approximately 2.0 mg/l. The aerators are automatically operated by the SCADA system, receiving oxygen readings through a Hach LDO system. There are also 2 Flygt mixers in each ditch to keep the mixed liquor well mixed. Handheld dissolved oxygen readings throughout the ditches are taken daily and checked against the LDO system.

The oxidation ditches have a hydraulic retention time of about 25 hours. The discharge from the oxidation ditches passes over discharge weirs and into an outlet box where flow is then split equally between two 30-foot-diameter clarifiers. In the clarifiers, solids settle to the bottom while scum floats on the surface. A skimmer mechanism collects and removes the scum, which is then pumped back to the headworks to be reprocessed. Sludge is collected and the returned to the oxidation ditches and anoxic zone through pumps located in the basement of the plant. Once or twice per week, depending

on the amount of solids in the system, sludge is removed to a waste holding tank and aerated. From this tank waste activated sludge is pumped to the belt filter press and dewatered. Polymer is used to assist in dewatering. Dewatered sludge is disposed at the local municipal landfill along with grit and screenings. Water from the belt filter press is sent to the septage holding tank and then pumped to the headworks for treatment.

Treated wastewater from the clarifiers passes over the weirs into an effluent trough. The effluent flows by gravity to the disinfection process, which consists of two ultraviolet light (UV) disinfection units. Disinfected effluent then flows by gravity, through the effluent flow meter. Effluent samples are taken following the effluent flow meter. Treated effluent then flows by gravity to the Ware River.

6.2 Permitted Outfalls

The outfall regulated in the draft permit is named 001-A.

6.3 Derivation of Effluent Limits under the Federal CWA and/or the Commonwealth of Massachusetts

BOD_5 and TSS

Under Section 301(b)(1)(B) of the Clean Water Act (CWA), Publicly Owned Treatment Works (POTWs) had to achieve effluent limitations based on secondary treatment by July 1, 1977. The secondary treatment requirements for biochemical oxygen demand (BOD_5) and total suspended solids (TSS) are in 40 CFR §133. The 30-day average percent removal limit of at least 85% for BOD_5 and TSS is based on the requirements in 40 CFR §133.102. From January 2008 through August 2010, Barre was in compliance with the BOD and TSS limits.

The limits from the current permit, which are 30 mg/l average monthly and 45 mg/l average weekly, will be carried over to the draft permit. The mass limits calculations for BOD_5 and TSS are below. Monitoring frequency is once per week.

Mass limits:	Flow x Concentration x Conversion Factor = lbs/day
Average monthly limit:	0.3 MGD x 30 mg/l x 8.34(lb)(l)/(mg)(gal) = 75 lbs/day
Average weekly limit:	0.3 MGD x 45 mg/l x 8.34(lb)(l)/(mg)(gal) = 113 lbs/day

pH

The draft permit includes pH limitations that are required by state water quality standards and are at least as stringent as pH limitations set forth at 40 C.F.R. § 133.102(c). The pH of the effluent shall not be less than 6.5 or greater than 8.3 standard units at any time. No violations of the pH limit occurred from January 2008 through August 2010. Monitoring frequency is once per day.

Escherichia coli

The *Escherichia coli (E. coli)* limits for Outfall 001-A are based on state water quality standards for Class B waters (314 CMR 4.05(b)(4)). The Commonwealth of Massachusetts promulgated *E. coli* criteria in the Surface Water Quality Standards (314 CMR § 4.00) on December 29, 2006, replacing fecal coliform bacteria criteria. These new criteria were approved by EPA on September 19, 2007.

The *E. coli* limits proposed in the draft permit are in effect from April 1st through October 31st of each year. The limits are 126 colony forming units per 100 ml (cfu/100 ml) geometric monthly mean and 409 cfu/100 ml maximum daily value (this is the 90% distribution of the geometric mean of 126 cfu/100 ml). The proposed *E. coli* monitoring frequency in the draft permit is once per week.

Total Nitrogen

Excessive nitrogen loadings are causing significant water quality problems in Long Island Sound, including low dissolved oxygen. In December 2000, the Connecticut Department of Environmental Protection (CT DEP) completed a total maximum daily load (TMDL) for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a waste load allocation (WLA) for point sources and a load allocation (LA) for non-point sources. The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25% reduction from the baseline total nitrogen loading estimated in the TMDL.

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

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

To ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25% reduction over baseline loadings, EPA intends to include a permit condition for all existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic, and Thames River watersheds, requiring the permittees to evaluate alternative methods of operating their treatment plants to optimize the removal of nitrogen, and to describe previous and ongoing optimization efforts. Facilities not currently engaged in optimization

[1] Estimated loading from TMDL (see Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound", April 1998).
[2] 25% reduction
[3] Estimated current loading from 2004 – 2005 DMR data.

efforts will also be required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase, and that their aggregate 25% reduction is maintained. Such a requirement has been included in this permit.

Specifically, the permit requires an evaluation of alternative methods of operating the existing wastewater treatment facility to control total nitrogen levels, including, but 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. This evaluation is required to be completed and submitted to EPA and MassDEP within one year of the effective date of the permit, along with a description of past and ongoing optimization efforts. The permit also requires implementation of optimization methods sufficient to ensure that there is no increase in total nitrogen compared to the existing average daily load. The annual average total nitrogen from this facility is calculated to be 63 lbs/day. The permit requires annual reports to be submitted that summarize progress and activities related to optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years. To better monitor the nitrogen removal in this optimization level, the total nitrogen monitoring has been increased to once per month.

As described previously, the treatment plant sometimes discharges high concentrations of ammonia. It also occasionally discharges high concentrations of nitrate plus nitrite, and total nitrogen. Table 1 below shows monitoring data for TKN (ammonia plus organic nitrogen), nitrate plus nitrite, and total nitrogen (the sum of TKN, nitrite and nitrate). As shown in Table 1, the nitrogen compounds in the discharge varies widely, as does the amount of total nitrogen. This indicates that influent concentrations probably vary, as well as the effectiveness of the biological processes that convert ammonia to nitrite nitrate (nitrification) and/or from nitrate to nitrogen gas (de-nitrification).

Table 1. Nitrogen Discharges from Barre WWTP, February 2008 – February 2011.

Date	Nitrate plus Nitrite (mg/l)	TKN (mg/l)	Total Nitrogen (mg/l)
2/29/2008	1.27	17	18.27
5/31/2008	19.	7.3	26.3
8/31/2008	0.8	2.2	3
11/30/2008	0.18	5.6	5.78
2/28/2009	3.6	54	57.6
5/31/2009	110.	2.3	112.3
8/31/2009	0.45	13.37	13.82
11/30/2009	1.8	24	25.8
2/28/2010	1.4	69.3	70.7
5/31/2010	47.	6.07	53.07
8/31/2010	51.	4.3	55.3
11/31/2010	35.5	3.28	38.78
2/28/2011	38	23.29	61.29

The draft permit requires that Barre monitor and report influent total nitrogen once per month. This information will help Barre WWTP and EPA determine the percentage removal of nitrogen occurring in the treatment system and assess the need for operational modifications to optimize nitrogen removal.

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

Ammonia-Nitrogen

High levels of ammonia in the water column can be toxic to fish by making it more difficult for fish to excrete this chemical via passive diffusion from gill tissues. Ammonia toxicity varies with pH and temperature. Ammonia can also lower dissolved oxygen levels by conversion to nitrate/nitrate, which consumes oxygen.

The current permit does not contain a limit for ammonia. Data from Whole Effluent Toxicity test monitoring show that effluent ammonia levels range from 0.21 mg/l to 70 mg/l. The highest readings occur in February of each year (see Table 4). Concentrations approaching 70 mg/l are extremely high for wastewater effluent, may cause treatment plant upsets, appear to be linked to periodic violations of whole effluent toxicity limits, and may pose a safety hazard to treatment plant personnel. EPA performed a reasonable potential analysis to determine whether effluent limits for ammonia are necessary to attain water quality standards.

EPA ammonia criteria recommend using the 30Q10 (the lowest 30-day average daily flow with a 10-year expected recurrence interval) for setting ammonia limits. Because the toxicity of ammonia varies with temperature and pH, separate 30Q10s and criteria are calculated for the winter and summer seasons. The 30Q10, criteria, and reasonable potential calculations are shown in Appendix B. There is reasonable potential for the effluent to cause or contribute to an exceedance of the chronic summer ammonia criterion of 2.72 mg/l. There is no reasonable potential to exceed the winter criteria.

A mass balance calculation was done to determine the summer ammonia effluent limit (see Appendix B). This analysis shows that the monthly average water quality-based ammonia effluent limit required to achieve the 2.72 mg/l chronic criterion is 46 mg/l. This limit has been included in the draft permit. However, the permittee should be aware that lower effluent ammonia concentrations are almost certainly necessary to achieve the annual total nitrogen mass loading limit of 63 lbs/day required by the Long Island TMDL, and to ensure that ammonia does not cause violations of whole effluent toxicity limits. Information supporting these conclusions is summarized in the following paragraphs.

As shown in the calculation below, a total nitrogen limit of 63 lbs/day and design flow of 0.3 MGD limits the concentration of total nitrogen in the effluent to 25 mg/l, lower than the calculated ammonia-only limit of 46 mg/l.

Load (lbs/day) = Design Flow (MGD) x Concentration (mg/l) x 8.34 (conversion factor)

$$\text{Concentration (mg/l)} = \frac{\text{Load (lbs/day)}}{\text{Design flow (MGD)} \times 8.34 \text{ (conversion factor)}}$$

$$\text{Concentration (mg/l)} = \frac{63 \text{ lbs/day}}{0.3 \text{ MGD} \times 8.34} = 25.2 \text{ mg/l}$$

An ammonia discharge of 46 mg/l would also appear to be inconsistent with the whole effluent toxicity (WET) limits in the permit (see page 16). From prior WET tests, it appears that effluent ammonia concentrations approximately 14 mg/l and higher may cause acute toxicity that exceeds WET limits.

The draft permit also contains a requirement for Barre to develop a Maximum Allowable Industrial Headworks Limit for ammonia to address the periodic spikes in ammonia concentration and to prevent an upset to the treatment process (see Section 7 – Pretreatment).

Phosphorus

State water quality standards require any point source discharge containing nutrients in concentrations that encourage eutrophication or growth of weeds or algae be provided with the highest and best practicable treatment to remove such nutrients. Phosphorus and other nutrients promote the growth of nuisance algae and aquatic plants. When these plants and algae undergo their decay processes, they generate strong odors, result in lower dissolved oxygen levels in the river, and impair the benthic habitat.

The Massachusetts Surface Water Quality Standards (314 CMR 4.00) do not contain numerical criteria for total phosphorus. The narrative 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 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). MassDEP has established that a monthly average total phosphorus limit of 0.2 mg/l (200 µg/l) represents highest and best practical treatment for POTWs.

EPA has published national guidance documents that contain recommended total phosphorus criteria and other indicators of eutrophication. EPA's Quality Criteria for Water 1986 (the Gold Book) recommends, to control eutrophication, that in-stream phosphorus concentrations should be less than 100 µg/l (0.100 mg/l) in streams or other flowing waters not discharging directly to lakes or impoundments and less than 50 µg/l in flowing waters discharging to lakes or impoundments.

More recently, EPA 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 ecoregion-specific criteria represent conditions in waters minimally impacted by human activities, and thus representative of water without cultural eutrophication. The Barre Wastewater Treatment Plant is within Ecoregion XIV, Eastern Coastal Plain, Northeastern Coastal Zone. Recommended criteria for this Ecoregion[4] includes a total phosphorus criteria of 23.75 µg/l (0.024 mg/l).

[4] Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV, published in December, 2001

EPA has typically applied the Gold Book criterion because it was developed from an effects-based approach versus the reference conditions-based approach used to develop the ecoregion criteria. The effects-based approach is taken because it is more directly associated with an impairment to a designated use (e.g. fishing). The effects-based approach provides a threshold value above which water quality impairments are likely to occur. It applies empirical observations of a causal variable (i.e. phosphorus) and a response variable (i.e. algal growth) associated with designated use impairments. Referenced-base values are statistically derived from a comparison within a population of rivers in the same ecoregional class. They are a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions.

The current permit limits the Barre WWTP effluent to 1 mg/l year-round. Since that limit went into effect in February 2009, monthly average phosphorus discharges have ranged from 0.36 mg/l to 2.16 mg/l, with 10 violations over 19 months. Visual observations by EPA staff during low flow periods in 2010 indicated excessive plant growth in the river, including rooted macrophytes, periphyton, and floating scum.

The phosphorus limit calculated for the current permit did not account for upstream concentration of phosphorus when setting effluent limitations. Accounting for upstream concentrations is necessary to ensure that the discharge from the Barre treatment plant does not cause or contribute to an exceedance of water quality standards. The limit has been recalculated taking the upstream concentration into account.

The 2003 Chicopee River Watershed Water Quality Assessment (2003 WQA) presented ambient phosphorus concentrations at USGS Gage 01173000, upstream on the Ware River from the Barre WWTP. During low flow conditions that year, the instream phosphorus concentration was 53 µg/l. We would note that more recent data collected by MassDEP have shown higher upstream phosphorus values; however these later data were not used to develop this permit because they have not been validated.

The box on the next page shows the necessary water quality based effluent limitation at an upstream concentration of 53 µg/l under 7Q10 conditions. This analysis shows that an effluent limitation of 888 ug/l (0.888 mg/l) is necessary.

Average Monthly Phosphorus Limit

$$Q_sC_s = Q_dC_d + Q_rC_r$$

Where

C_s	=	Concentration below outfall	=	100 µg/l
Q_s	=	Streamflow below outfall (effluent + upstream)	=	8.17 cfs
Q_d	=	Discharge flow	=	0.46 cfs
C_d	=	Discharge concentration	=	?
Q_r	=	Upstream flow	=	7.71 cfs
C_r	=	Upstream concentration	=	53 µg/l

Therefore,

$$C_d = \frac{(8.17 \text{ cfs} \times 100 \text{ µg/l}) - (7.71 \text{ cfs} \times 53 \text{ µg/l})}{0.46 \text{ cfs}}$$

$$= 888 \text{ µg/l} = 0.888 \text{ mg/l} \approx 0.9 \text{ mg/l}$$

To ensure attainment of water quality standards, the draft permit contains a monthly average limit of 0.9 mg/l for the growing season months of April through October and 1 mg/l for the non-growing season months of November through March. The maximum daily effluent concentration must also be reported. The monitoring frequency is once per week. If new water quality data or the completion of a total maximum daily load analysis (TMDL) indicates the need for more stringent limits, EPA and DEP may exercise the reopener clause of Part II A.4. of this permit and modify the phosphorus numerical limits.

Copper

Copper is toxic to aquatic life at low concentrations. The current permit includes a monthly average limit of 67 µg/l and a maximum daily limit of 89 µg/l. These limits were calculated using a hardness value of 20 mg/l for the receiving water and a dilution factor of 29. An examination of the DMR data from January 2008 through August 2010 indicates that the monthly average effluent copper ranged from 10 µg/l to 242 µg/l, with violations of both the average monthly and maximum daily limits in February 2008.

An updated permit limit has been calculated to account for the revised dilution factor. The proposed permit limit also accounts for background levels of copper in the Ware River as indicated by upstream samples taken for Whole Effluent Toxicity testing dilution water.

The EPA Quality Criteria for Water, 1986, set forth the method for establishing water quality criteria for copper, a hardness dependent pollutant. In the National Recommended Water Quality Criteria: 2002, EPA updated its national recommended water quality criteria for pollutants. 314 CMR 4.05(5)(e) Toxic Pollutants of the State water quality standards specifies, "[t]he Department shall use the water quality criteria for the protection of aquatic life expressed in terms of the dissolved fraction

of metals when EPA's 304(a) recommended criteria provide for use of the dissolved fraction." It further states that "permit limits will be written in terms of total recoverable metals."

Hardness data used to calculate the copper criteria below are from Barre's Whole Effluent Toxicity (WET) test reports from February 2009 through February 2011. The hardness values used in this calculation are the median hardness values measured in the treatment plant discharge and the upstream receiving water during this period. Hardness data used to calculate the criteria are included in Appendix C.

Hardness Analysis

$$Q_sC_s = Q_dC_d + Q_rC_r$$

Where

C_s	=	Concentration below outfall		
Q_s	=	Streamflow below outfall (effluent + upstream)	=	8.17 cfs
Q_d	=	Discharge flow	=	0.46 cfs
C_d	=	Discharge concentration	=	100 mg/l
Q_r	=	Upstream flow	=	7.71 cfs
C_r	=	Upstream concentration	=	16 mg/l

Therefore,

$$C_r = \frac{(0.46 \text{ cfs} \times 100 \text{ mg/l}) + (7.71 \text{ cfs} \times 16 \text{ mg/l})}{8.17 \text{ cfs}}$$

$$= 21 \text{ mg/l}$$

Using a hardness value of 21 mg/l and a conversion factor (CF) to convert recoverable to dissolved copper, the chronic and acute criteria calculations for the State water quality standards are as follows.

Chronic instream criteria $e^{((0.8545*\ln 21) + (-1.702))} = 2.46$ µg/l (total recoverable)
Acute instream criteria $e^{((0.9422*\ln 21) + (-1.700))} = 3.22$ µg/l (total recoverable)

EPA then evaluated the available instream data to determine the background concentration of copper in the Ware River upstream of the treatment plant discharge. Data from the WET test dilution samples are shown below:

Table 2. Upstream copper data from February 2008 through November 2010.

Date	Upstream Copper Concentration (µg/l)
2/14/08	4
5/15/2008	4
8/14/08	6
11/13/08	4

2/12/2009	2
5/14/2009	4
8/13/2009	2
11/12/2009	5
2/11/2010	6.8
5/13/2010	7
8/12/2010	4.4
11/11/2010	4.7
Average	4.49
Median	4.4

These data show that the copper concentrations in the receiving water upstream of the discharge frequently exceed the chronic 2.46 µg/l and acute 3.22 µg/l water quality criteria.

Because the receiving water upstream of the discharge is not in attainment of water quality criteria, the effluent limitations must be set equal to the applicable criteria to ensure that the discharge does not cause or contribute to an exceedance of the water quality criteria.

The average monthly total copper limit is 2.5 µg/l and the maximum daily limit is 3.2 µg/l. Total copper analysis shall be performed using EPA Method 200.8 ICP/MS – inductively coupled plasma spectrometry, as this is the only approved method under 40 CFR Part 136 that provides a minimum level of detection (0.5 µg/l) in the range of the permit limits. Monitoring frequency has been increased to once per month. If one sample is taken per month, then each sample must meet the average monthly limit. The maximum daily limit only applies if the permittee chooses to sample more than once per month.

Aluminum

Aluminum, in the form of alum or other compounds, is a commonly used chemical additive in wastewater treatment to remove phosphorus. Aluminum compounds are used in the treatment process at the Barre WWTP. The release of aluminum into the environment can result in levels that are highly toxic to aquatic life. The Massachusetts Water Quality Standards establish that for toxic pollutants not otherwise listed in 314 CMR 4.00, the *National Recommended Water Quality Criteria*: *2002* (US EPA 2002 [EPA-822-R-02-047]) are the allowable receiving water concentration of the affected receiving water (see 314 CMR 4.05(5)(e)). The freshwater aluminum aquatic life criteria in the *National Recommended Criteria* are a chronic criterion of 87 µg/l and an acute criterion of 750 µg/l.

The current permit requires monitoring for aluminum as part of the Whole Effluent Toxicity (WET) testing, which is done quarterly. Both upstream and effluent samples are analyzed. A summary of the aluminum monitoring data from 2008-2010 is presented below in Table 3. All Ware River samples that exceed the chronic aluminum criterion (87 µg/l) are highlighted in yellow.

Table 3. Aluminum Levels in Barre WWTP Effluent and the Ware River, February 2008 – November 2010

Date	Effluent (µg/l)	Ware River (µg/l)
2/15/2008	70	185
5/15/2008	55	112
8/15/2008	28	147
11/13/2008	ND(<10)	98
2/12/2009	31	139
5/14/2009	43	117
8/13/2009	64	113
11/12/2009	530	92
2/11/2010	56	81
5/13/2010	440	70
8/12/2010	320	170
11/31/2010	N/A	92

The chronic water quality criterion for aluminum was exceeded in 83% of the Ware River samples. Based on the Ware River data it is clear that the aluminum concentration upstream of the discharge has regularly exceeded the applicable chronic water quality criteria. This means that any addition of aluminum to the receiving water above the chronic criterion, 87 µg/l, would contribute to an exceedance of water quality standards in the Ware River.

The Massachusetts Water Quality Standards state that "[t]he Department 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" and that " [i]n establishing water quality based effluent limitations the Department shall take into consideration natural background conditions and existing discharges" (314 CMR 4.03(1)(a)).

Accordingly, a monthly average effluent limit of 87 µg/l has been included in the draft permit to ensure that the discharge does not cause or contribute to a violation of Massachusetts Water Quality Standards. Monitoring frequency is once per month.

In the event that subsequent sampling shows that aluminum levels in Ware River and in the discharge are less than the chronic criteria, the permittee may request a modification of the effluent limit. EPA believes that at least four instream samples and twelve effluent samples (one year of data) would be the minimum number of samples necessary to support such a modification request.

Whole Effluent Toxicity

National studies conducted by the Environmental Protection Agency have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents and aromatic hydrocarbons among others. The Region's current policy is to include toxicity testing requirements in all municipal 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 and industrial contributions, and in accordance with EPA regulation and policy, the draft permit includes revised acute and chronic 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). EPA Region 1 has developed a toxicity control policy that requires wastewater treatment facilities to perform toxicity bioassays on their effluents.

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 current permit requires acute toxicity testing and that the LC_{50} be at least 100% of the effluent concentration (i.e. undiluted effluent shall not cause mortality among the majority of the test organisms). Examination of the acute toxicity test results in Table 4 indicates that over the past 17 quarters, Barre WWTP exceeded the acute toxicity tests requirements five times (i.e. 29% of the time). A rudimentary analysis of the chemical data submitted with the WET tests appears to show a correlation between the WET results and ammonia, which would indicate that the WET test exceedances are caused by ammonia toxicity. Also, the discharge concentrations of ammonia exceed the acute ammonia criteria, further supporting a conclusion that the measured whole effluent toxicity is caused by ammonia.

If the pretreatment and optimization requirements of the permit do not remedy the WET violations, EPA may require the permittee to conduct a toxicity identification evaluation (TIE) and a toxicity reduction evaluation (TRE).

Table 4. Acute Effluent Toxicity, February 2008 through November 2010.

Date	LC50 (% effluent)	Ammonia (mg/l)
Feb-07	18.3	70
May-07	100	9.9
Aug-07	100	0.22
Nov-07	100	1.1
February-08	70.7	14
May-08	100.	0.21
August-08	100.	0.76
November-08	100.	3.4
February-09	35.4	66
May-09	100.	3.5
August-09	100.	15
November-09	25.5	63
February-10	35.4	48
May-10	100.	0.59
August-10	100.	0.69
November-10	100.	0.37
Feb-11	100.	11

The draft permit contains a revised dilution factor of 17.8. Pursuant to EPA Region 1 and DEP policy, discharges having a dilution ratio between 10:1 and 20:1 require acute and chronic toxicity testing four times per year. The draft permit contains requirements for quarterly acute toxicity tests using the species *Ceriodaphnia dubia*, only. The acute (LC_{50}) whole effluent toxicity endpoint must be >100%. Barre must also report the chronic toxicity endpoint C-NOEC (Chronic No Effect Concentration). The tests must be performed in accordance with the test procedures and protocols specified in **Permit Attachment A**. The tests will be conducted four times a year, during the following months: February, May, August, and November.

7. Pretreatment

Barre WWTP has not been required to develop and implement and industrial pretreatment program because it does not exceed the threshold design flow of 5 MGD (see 40 CFR 403.8(a)). There are two industrial users that discharge wastewater to the Barre WWTP. Chas. Allen, a machine shop, is a Categorical Industrial User (CIU), meaning that it is already subject to technology-based effluent limits set by EPA for its industrial category. Chas. Allen manufactures metal finishing machines and tests a small number of them in their product laboratory. The discharge from this user is approximately 11,000 gallons per year of rinse water.

The other industrial user is Waste Management, which operates a landfill and discharges 24,000 gallons per day of landfill leachate to Barre WWTP. There are no federal pretreatment standards for landfills, but there are effluent limitation guidelines for direct discharges (see 40 CFR 445) that include effluent limitations for ammonia, indicating that ammonia is a pollutant of concern in landfill discharges. According to Barre WWTP operations staff, discharges from Waste Management have caused at least one upset to the WWTP in the past five years due to high ammonia concentrations.

Barre has a local sewer use ordinance, but has not set local limits for either of its industrial users. To prevent future upsets due to high ammonia levels in the influent from Waste Management, the draft permit requires that, within 120 days of the effective date of the permit, Barre develop a Maximum Allowable Industrial Headworks Loading (MAIHL) limit for ammonia. Barre must submit the MAIHL to EPA, and upon EPA approval, the MAIHL must be immediately adopted into Barre's local sewer use ordinance.

8. Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with the National Marine Fisheries Services (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes; may adversely impact any essential fish habitat as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 U.S.C. § 1802 (10)). Adversely impact means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. § 600.910 (a)). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Essential fish habitat (EFH) is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b) (1) (A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

The Ware River is a tributary of the Chicopee River, which flows into the Connecticut River, which ultimately drains into the Long Island Sound. The Connecticut River system has been designated as EFH for Atlantic salmon. Although EFH has been designated for this general location, EPA has concluded that this activity is not likely to affect EFH or its associated species for the following reasons:

- The quantity of the discharge from the WWTP is 0.3 MGD, and the effluent receives advanced treatment;
- The facility withdraws no water from the Ware River; therefore no life stages of Atlantic salmon are vulnerable to impingement or entrainment from this facility;
- Limits specifically protective of aquatic organisms have been established for phosphorus, aluminum, and copper, based on EPA water quality criteria;
- The facility uses ultra-violet disinfection; therefore the effluent is free from chlorine.
- Acute and chronic toxicity testing on *Ceriodaphnia dubia* is required four (4) times per year. Because of recent problems with effluent toxicity, the draft permit requires that Barre set a Maximum Industrial Headworks limit for ammonia.
- The permit prohibits any violation of state water quality standards.

EPA believes that the conditions and limitations contained within the draft permit adequately protect all aquatic life, including those species with EFH designation. Impacts associated with issuance of this permit to the EFH species, their habitat and forage, have been minimized to the extent that no significant adverse impacts are expected. Further mitigation is not warranted.

9. Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973 (ESA), as amended, grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish, wildlife, or plants to see if any such listed species might potentially be impacted by the re-issuance of this NPDES permit. The review focused mainly on the small whirled pogonia (*Isotria medeoloides*), an orchid. No other federally listed species occur in Worcester County.

The small whirled pogonia orchid has been identified in Worcester County, Massachusetts, where the Barre WWTP is located, however it is not been identified in the Town of Barre itself. The small

whorled pogonia is found in "forests with somewhat poorly drained soils and/or a seasonally high water table," according to the USFWS website. This species is not aquatic; therefore it is unlikely that it would come into contact with the facility discharge. Furthermore, the primary threats to this species are habitat destruction and herbivory, factors not affected by this permit action.

10. Monitoring

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

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

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

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

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

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

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

to EPA using NetDMR, unless the permittee submits a renewed opt-out request sixty (60) days prior to expiration of its opt-out, and such a request is approved by EPA.

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

11. State Certification Requirements

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 MassDEP Commissioner.

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

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection, 5 Post Office Square, Suite 100, Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA 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.

13. General Conditions

The general conditions of the permit are based on 40 CFR Parts 122, Subparts A and D and 40 CFR §124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

14. State Certification Requirements

The staff of the Massachusetts Department of Environmental Protection ("MassDEP") 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.

15. EPA & MassDEP Contacts

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:

Robin L. Johnson
EPA New England – Region 1
5 Post Office Square, Suite 100
Mail Code OEP06-1
Boston, MA 02109-3912
Telephone: (617) 918-1045 FAX: (617) 918-0045
Johnson.Robin@epa.gov

Kathleen Keohane, Massachusetts Department of Environmental Protection
Division of Watershed Management, Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608
Telephone: (508) 767-2856 FAX: (508) 791-4131
kathleen.keohane@state.ma.

_____
Date

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

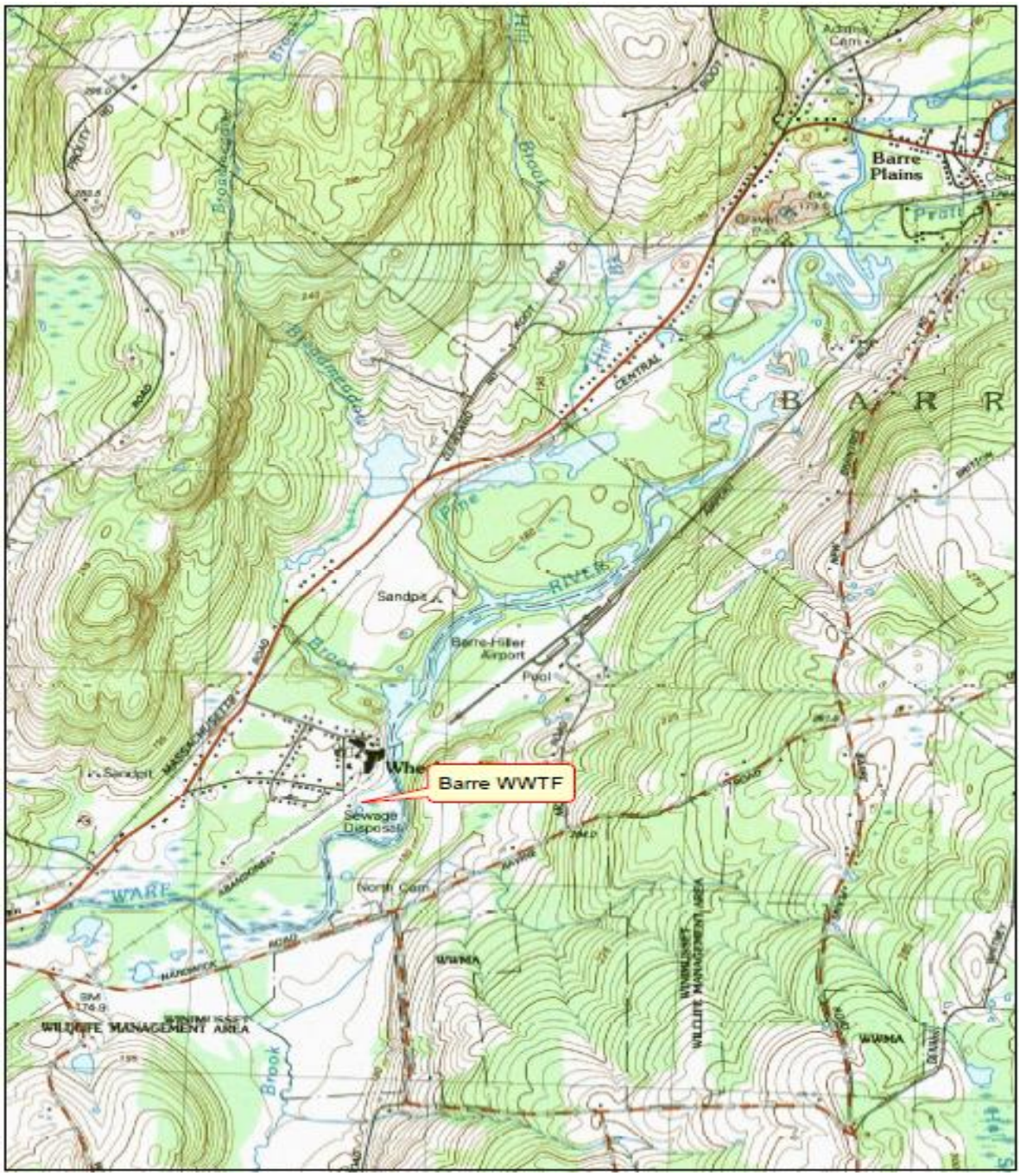


Figure 1 – Facility Location Map

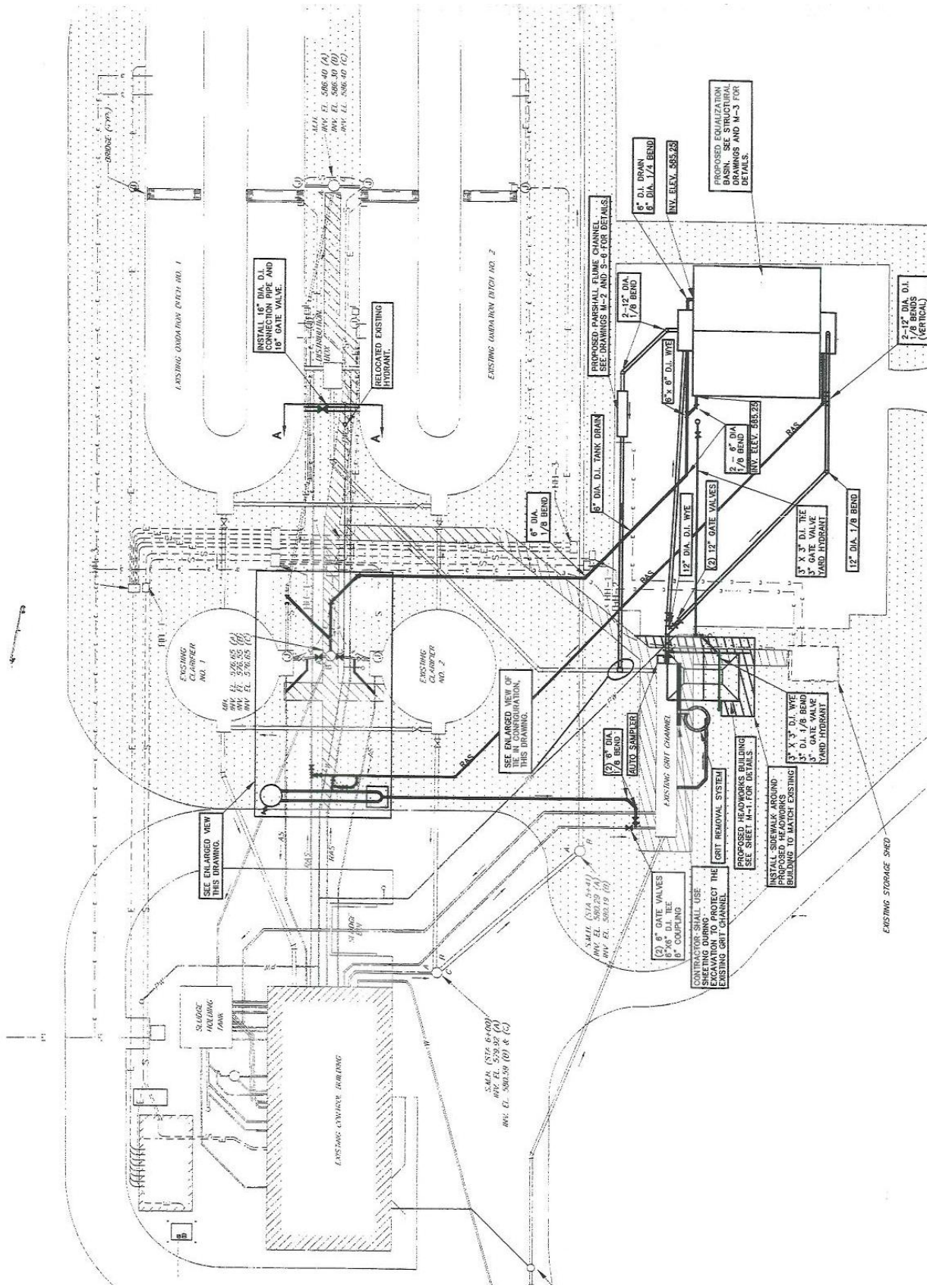


Figure 2 – Facility Schematic

Appendix B
Ammonia Calculations

Summer Ammonia Criteria (at 24 C and pH 7.5, salmonids present, early fish life stages present)[5]

Acute: 13.3 mg/l
Chronic: 2.37 mg/l

Winter Ammonia Criteria (at 0 C and pH 7.6, salmonids present, early fish life stages present) [6]

Acute 11.4 mg/l
Chronic 3.98 mg/l

pH Data from Whole Effluent Toxicity Tests (used in determining water quality criteria)

Date	Effluent pH	Ambient pH
2/15/2007	7.9	6
5/10/2007	7.4	6.1
8/9/2007	7.7	6.9
11/8/2007	7.6	7
2/14/2008	7.3	6.2
5/15/2008	7.3	6.8
8/14/2008	7.5	6.5
11/13/2008	7.5	6.5
2/12/2009	7.6	6.3
5/14/2009	7.4	6.5
8/13/2009	7.5	6.6
11/12/2009	8	7.2
2/11/2010	7.7	6.7
5/13/2010	6.9	6.8
8/12/2010	7.8	7.5
11/11/2010	7	7.2
2/10/2011	7	6
May/Aug median	7.45	6.7
Nov/Feb median	7.6	6.5

[5] Pages 86-87 of 1999 Update of Ambient Water Quality Criteria for Ammonia (EPA-822-R-99-014)

Annual/summer 30Q10 (for calculation of limits from April 1 – October 31)

30Q10 at USGS 011723000 WARE RIVER AT INTAKE WORKS NEAR BARRE, MA = 8.25cfs
Drainage Area = 96.3 square miles

30Q10 at USGS 01173500, Ware River at Gibbs Crossing, MA = 23.1 cfs
Drainage Area = 197 square miles

Flow factor for area between USGS 01173000 and USGS01173500 =

(23.1 cfs – 8.25 cfs)/(197 sq. mi. – 96.3 sq. mi.) = 14.85 cfs/100.7 sq. mi. = 0.147 cfs/sq. mi.

Drainage Area at Outfall = 115 square miles

30Q10 = 8.25 cfs + 0.147 cfs/square miles x (115 sq. mi. – 96.3 sq. mi.) = 11.0 cfs

Barre WWTP design flow = 0.3 MGD x 1.53 cfs/MGD = 0.46 cfs

Dilution Factor = (Facility Flow + 7Q10)/7Q10
Dilution Factor = (11 cfs + 0.46 cfs)/0.46 cfs = **25**

Ammonia Data Used in Reasonable Potential Analysis

Date	Effluent (mg/l)	Background (mg/l)
2/15/2007	70	0.16
5/10/2007	9.9	0.06
8/9/2007	0.22	0.03
11/8/2007	1.1	0.05
2/14/2008	14	0.09
5/15/2008	0.21	0.09
8/14/2008	0.76	0.16
11/13/2008	3.4	0.15
2/12/2009	66	0.55
5/14/2009	3.5	0.13
8/13/2009	15	0.15
11/12/2009	63	0.15
2/11/2010	48	0.26
5/13/2010	0.59	0.1
8/12/2010	0.69	0.052
11/11/2010	0.37	0.053
2/10/2011	11	0.2
median	3.5	0.13
average	18.10	0.14

Effluent Concentration Necessary to Meet Summer Chronic Criterion

$$Q_sC_s = Q_dC_d + Q_rC_r$$

Where

C_s	=	Concentration below outfall	=	2.72 mg/l
Q_s	=	Streamflow below outfall (effluent + upstream)	=	8.17 cfs
Q_d	=	Discharge flow	=	0.46 cfs
C_d	=	Discharge concentration		
Q_r	=	Upstream flow	=	7.71 cfs
C_r	=	Upstream concentration	=	0.13 mg/l

Therefore,

$$C_d = \frac{(8.17 \text{ cfs} \times 2.72 \text{ mg/l}) - (7.71 \text{ cfs} \times 0.13 \text{ mg/l})}{0.46 \text{ cfs}}$$

$$= 46 \text{ mg/l}$$

Winter 301Q10 (for calculation of limits from November 1- March 31)

Winter 30Q10 at USGS 011723000 Ware River at Intake Works near Barre, MA = 51.4 cfs
Drainage Area = 96.3 square miles

Winter 30Q10 at USGS 01173500, Ware River at Gibbs Crossing, MA = 98.4 cfs
Drainage Area = 197 square miles

Flow factor for area between USGS 01173000 and USGS01173500 =

(98.4 cfs – 51.4 cfs)/(197 sq. mi. – 96.3 sq. mi.) = 47 cfs/100.7 sq. mi. = 0.47 cfs/sq. mi.

Drainage Area at Outfall = 115 square miles

30Q10 = 51.4 cfs + 0.47 cfs/square miles x (115 sq. mi. – 96.31 sq. mi.) = 60.2 cfs

Barre WWTP design flow = 0.3 MGD x 1.53 cfs/MGD = 0.46 cfs

Dilution Factor = (Facility Flow + 7Q10)/7Q10
Dilution Factor = (60.2 cfs + 0.46 cfs)/0.46 cfs = **132**

Reasonable Potential Analysis for Winter Ammonia Discharges

$$Q_sC_s = Q_dC_d + Q_rC_r$$

Q_s = receiving water flow = $Q_s + Q_d$	= 0.46 cfs + 60.2 cfs = 60.66 cfs
C_s = receiving water concentration	= ?
Q_d = effluent flow, i.e. facility design flow	= 0.46 cfs
C_d = effluent pollutant concentration	= 70 mg/l (highest data point)
Q_r = 30Q10 flow of receiving water	= 60.2 cfs
C_r = upstream concentration	= 0.13 mg/l

$$C_s = \frac{(0.46 \text{ cfs} \times 70 \text{ mg/l}) + (60.2 \text{ cfs} \times 0.13 \text{ mg/l})}{60.66 \text{ cfs}}$$

$C_s = 0.66$ mg/l < 3.98 (winter chronic criterion) and < 11.4 (winter acute criterion).

There is no reasonable potential for the discharge to cause or contribute to an exceedance of the acute or chronic water quality criterion.

RESPONSE TO COMMENTS
REISSUANCE OF NPDES PERMIT NO. MA0103152
BARRE WASTEWATER TREATMENT PLANT
BARRE, MASSACHUSETTS

From February 3, 2012 through March 3, 2012, the U.S. Environmental Protection Agency (EPA-New England) and the Massachusetts Department of Environmental Protection (MassDEP) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the Barre Wastewater Treatment Plant in Barre, MA.

EPA-New England and MassDEP received comments from the Town of Barre (the Town), Tata & Howard, MassDEP, the Connecticut River Watershed Council, U.S. Representative John W. Olver, State Senator Stephen M. Brewer, and State Representative Anne M. Gobi. The following are responses to those comments by EPA-New England, and descriptions of any changes made to the public-noticed permit as a result of those comments.

A copy of the Final Permit and this Response to Comments document will be posted on the EPA Region 1 web site: http://www.epa.gov/region1/npdes/permits_listing_ma.html.

A copy of the Final Permit may also be obtained by writing or calling Robin Johnson, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, Massachusetts 02109-3912; Telephone (617) 918-1045.

1. Changes made to the final permit

a. Page 2 of 15: Outfall 001-A has been renamed "Outfall 001." This change was made to facilitate compliance tracking.
b. Page 2 of 15: The ammonia nitrogen limit was removed from the effluent limitations table. The permittee is required to monitor ammonia once per week year-round. See Comment C9.
c. Page 2 of 15: Dissolved oxygen limit of "not less than 6 mg/L" has been removed from the effluent limitations table. See Comment B1.
d. Page 3 of 15: Total hardness (mg/L) was added to the list of parameters in the effluent limitations table that the permittee must report from the quarterly whole effluent toxicity test effluent and dilution samples. This parameter was inadvertently omitted from the draft permit. It is routinely sampled in conjunction with WET tests, so does not increase sampling requirements.
e. Page 4-5 of 15, Footnotes 8 and 10: 48-month compliance schedules have been added to the final permit for achieving the aluminum and copper effluent limits. The purpose of these schedules is to allow the Town time to characterize sources of these metals in the system and to analyze alternatives for meeting the limits. Also, the compliance schedules allow time for MassDEP to investigate whether alternative water quality criteria

can be developed that are protective of uses, and then to develop and adopt such criteria if it so chooses. The Town is required to submit progress reports every 12 months describing progress made toward attaining the aluminum and copper limits in the previous 12 months. See Comments B2 and B5.

f. Page 6 of 15, Footnote 15: This footnote was added to clarify the requirement to report on the DMR certain parameters from the 100% effluent sample in whole effluent toxicity tests. This is a standard footnote being added to all reissued permits and does not include new sampling requirements.
g. Page 8 of 15: The first sentence of Part I.B. Unauthorized Discharges was changed to clarify that this permit does not prohibit discharges authorized by other NPDES permits. The sentence now reads: This permit authorizes discharges only from the outfall(s) listed in Part I A.1.of this permit, in accordance with the terms and conditions of this permit.
h. Page 12 of 15, Item D.6.: Text was added to the Sludge Conditions section clarifying that the sampling requirements in this item do not apply to sludge disposal methods not regulated under 40 CFR Part 503 (such as sludge disposal in a municipal solid waste landfill – see item I.D.6). See Comment A1.
i. Page 13 of 15, Part I.F., Monitoring and Reporting Requirements: Because the Town of Barre has already begun using NetDMR for submittal of DMRs and other reports, the compliance schedule for adoption of NetDMR was removed from the permit.
j. Page 14 of 15: The state contact information was corrected to indicate that the only hard copy reports that must be submitted to the Surface Water Permit Program are WET test reports, aluminum and copper progress reports, and nitrogen optimization reports.

2. COMMENTS FROM THE TOWN OF BARRE

COMMENT A1:

The commissioners request that the EPA adjust the sludge disposal requirements of the draft permit to better reflect the approved practices of sludge disposal currently used by the Town of Barre Wastewater Treatment Facility.

The sludge disposal method falls within the EPA Region 1, NPDES Sludge Compliance Guidance, 04 November 1999; Page 55, Section 2.3.4 Scenario 4. Item #2 of this Guidance, which states, “Sewage sludge disposed of in a municipal solid waste landfill shall not be hazardous. The Toxicity Characterization Leachate Protocol (TCLP) shall be used as demonstration that the sludge is non-hazardous”, appears to conflict with Part I, D, 6 of the draft permit.

RESPONSE A1:

Condition I.D.6. of the draft permit, which designates sludge sampling frequencies, does not apply to sludge disposal at a municipal solid waste landfill. Condition I.D.6. now reads (change shown in italic):

6. *Where 40 C.F.R. Part 503 applies*, the sludge shall be monitored for pollutant concentrations (all Part 503 methods) and 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 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

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

3. COMMENTS FROM TATA & HOWARD

COMMENT B1:

Proposed Effluent Limits for Dissolved Oxygen = Not less than 6.0 mg/l
The Barre Wastewater Treatment Facility (BWWTF) is currently able to achieve a dissolved oxygen concentration of approximately 5.0 mg/l in the effluent prior to discharge. The BWWTF was not designed to add supplemental oxygen to the effluent. Therefore, the Commissioners respectfully request a reduction in the proposed effluent limit for dissolved oxygen to 5.0 mg/l.

RESPONSE B1:

The dissolved oxygen limit was added to the permit in error. The dissolved oxygen water quality criterion for the receiving water is 5 mg/l, there is no indication that this criterion is not achieved in the receiving water, and the discharge concentration achieves the criterion. Therefore, there is no reasonable potential for the discharge to cause or contribute to an excursion from water quality standards for dissolved oxygen in the Ware River. EPA has removed this limit from the final permit.

COMMENT B2:

Proposed Effluent Limits for Total Copper = 2.3 μg/l ave. monthly and 2.9 μg/l max. daily

The Commissioners strongly object to the imposition of an effluent limit that is unachievable. We question whether effluent limitations that are this low can actually be measured with any consistency in the laboratory.

It is important to point out that EPA has yet to address the nationally debated issue of bioavailability of copper in biologically treated effluents. There is a national consensus forming around the more appropriate regulation of only toxic forms of copper in discharge permits. Such a policy would conserve limited local resources that currently are wasted on removing non-toxic forms of copper from municipal wastewaters.

RESPONSE B2:

The copper limits in the draft permit released for public notice are 2.5 µg/L average monthly and 3.2 µg/L maximum daily, rather than the ones referenced in the comment.

The State of Massachusetts' Water Quality Standards require that effluent limitations for metals be based upon the criteria published in the National Recommended Water Quality Criteria: 2002 (USEPA 2002 [EPA-822-R-02-047]), unless site-specific criteria are established or MassDEP determines that natural background concentrations are higher than the criteria (314 CMR § 4.05(5)(e)).

MassDEP has not established site-specific criteria for copper for the Ware River, nor have they determined that the natural concentrations of copper in the river are greater than the criteria published by EPA. Therefore, because the criteria in the National Recommended Water Quality Criteria: 2002 (USEPA 2002[EPA-822-R-02-047]) have been adopted by the State into their approved water quality standards (see 314 CMR 4.05 (e)(5), they were used to develop the effluent limits for copper in the draft permit to ensure attainment of water quality standards in the receiving water.

The commenter references the bioavailability of copper in biologically treated effluents to support its argument that application of the national chronic criterion is too stringent in setting the copper effluent limitation in this permit. Metal bioavailability and toxicity have long been recognized to be a function of water chemistry. The Biotic Ligand Model was developed to incorporate metal speciation and the protective effects of competing cations into predictions of metal bioavailability and toxicity. EPA currently recommends the use of this model for determining copper water quality criteria. However, these criteria have not yet been adopted by MassDEP and approved by EPA Region 1 in the current water quality standards, so we are precluded from using it to develop permit limits at this time.

However, given the inherent difficulty of complying with such low copper limits, we have added a compliance schedule of 48 months for the copper limit to the Final Permit to give the Town time to evaluate sources of copper in the treatment system and to evaluate alternatives in meeting the limit. Such schedules are authorized by Massachusetts Water Quality Standards for "limitations that are based on new, newly interpreted or revised water quality standards…" [see 314 CMR 4.03(1)(b)]. In addition,

the final permit requires the Town to submit progress reports every 12 months describing actions taken to meet the permit limit during the previous 12 months. It is also possible that MassDEP will adopt site-specific copper criteria by this time.

If the Town wishes to encourage Massachusetts to develop new site-specific copper criteria, then we suggest that the Town begin a dialogue with the Massachusetts Department of Environmental Protection on this issue. We are happy to provide any guidance and assistance that we can if the Commonwealth determines it appropriate to pursue this approach.

In those cases where the state does develop site-specific criteria, Massachusetts regulations require that such an effort be documented and subject to full inter-governmental coordination and public participation. *See* 314 C.M.R. § 4.05(5)(e)(4). In addition, federal law requires EPA's review and approval of Massachusetts' development and adoption of site-specific criteria. *See* 40 C.F.R. § 131.11(b)(1)(ii) and 40 C.F.R.§ 131.21.

COMMENT B3:

The last four consecutive whole effluent toxicity tests prove that the discharge from the BWWTF is not toxic to aquatic life. These tests were performed after the optimization of coagulant dose and feed location which resulted in substantial improvement in phosphorus and copper removal from the wastewater. In 2011, effluent copper concentrations averaged 33 μg/l with a maximum concentration of 40 μg/l.

RESPONSE B3:

The copper criteria and limit in the draft permit were determined from analysis of the instream and effluent copper data provided by Barre. EPA is required to include water quality-based limits for pollutants where the discharge has the reasonable potential to cause or contribute to an excursion above any State water quality standard. 40 CFR 122.44 (d). Compliance with whole effluent toxicity limits does not support removal of chemical-specific limits necessary to attain a State water quality criterion.

When determining whether there is reasonable potential for a discharge to cause or contribute to an excursion from water quality standards, EPA uses three approaches: biological assessment, chemical specific criteria, and whole effluent toxicity testing. With the advent of different ways of assessing the health of aquatic systems comes the possibility of conflicting results. To address such conflicts, EPA developed the policy of independent application. Independent application states that where different types of monitoring data are available for assessment of whether a water body is attaining aquatic life uses or for identifying the potential of pollution sources to cause or contribute to non attainment of aquatic life uses, any one assessment is sufficient to identify an existing or

potential impact/impairment, and **no one assessment can be used to override a finding of existing or potential impact or impairment based on another assessment.**[1]

Since each type of criteria (biological criteria, chemical-specific criteria, or whole-effluent toxicity evaluations) has different sensitivities and purposes, a criterion may fail to detect real impairments when used alone. As a result, these methods are used together in an integrated water quality assessment, each providing an independent evaluation of nonattainment of a designated use.

If any one type of criteria indicates impairment of the surface water, regulatory action can be taken to improve water quality. However, no one type of criteria can be used to confirm attainment of a use if another form of criteria indicates nonattainment. When these three methods are used together, they provide a powerful, integrated, and effective foundation for waterbody management and regulations.

COMMENT B4:

The Commissioners are equally concerned with the fact none of the three municipal wastewater treatment facilities that discharge to the Ware River downstream of the BWWTF have **any** discharge limitations on copper. This might be understandable if these permits were anticipated to be renewed in the near future. However, the comment period for the two discharge permits for the Town of Hardwick just closed last month. Therefore, these permits are likely to go into effect shortly, if they haven't already. The fact sheets for each of these permits stated in part:

> ***"Certain metals like copper, lead, cadmium and zinc can be toxic to aquatic life. EPA has evaluated (see below) the reasonable potential of these metals to cause or contribute to exceedances of water quality standards. Based on this evaluation, EPA has determined that there is no reasonable potential for these metals to cause or contribute to exceedances. The draft permit therefore does not include effluent limitations for these metals. These metals will continue to be monitored twice per year in conjunction with the WET test requirements."***

The permit writer for the two Ware permits went on to present calculations backing up their contention that a copper limit is not necessary. These calculations were prefaced by the following statement:

> ***"EPA recommended criteria from National Recommended Water Quality Criteria: 2002 and a dilution factor of 34.7 has been used in the calculations.***

The fact sheet for draft permit for the BWWTF referenced the same source for water quality criteria in determining copper limits. The fact sheet stated in part:

[1] EPA's Technical Support Document for Water Quality-Based Toxics Control, March 1991, EPA/505/2-90-001, Responsiveness Summary, page 2.

> ***"In the National Recommended Water Quality Criteria: 2002, EPA updated its national recommended water quality criteria for pollutants."***

However, the permit writer for the draft discharge permit for the BWWTF then went on to employ a completely different methodology for calculating the copper limit. The permit writer presented the "chronic and acute criteria calculations for the state water quality standards" along with "background concentrations of copper in the Ware River upstream of the treatment plant discharge". The fact sheet goes on to state:

> ***"These data show that the copper concentrations in the receiving water upstream of the discharge frequently exceed the chronic 2.46 µg/l and acute 3.22 µg/l water quality criteria. Because the receiving water upstream of the discharge is not in attainment of water quality criteria, the effluent limitations must be set equal to the applicable criteria to ensure that the discharge does not cause or contribute to an exceedance of the water quality criteria."***

The fact sheet then concludes that the proposed copper limits for the BWWTF would be:

> ***"The average monthly total copper limit is 2.5 µg/l and the maximum daily limit is 3.2 µg/l."***

It is difficult to understand how two permit writers in the same EPA office could reference the same national water quality criteria publication yet employ such radically different methodologies for setting a proposed discharge permit limitation. It is even more difficult to understand when you consider that these discharges are approximately two miles apart on the same body of water.

For all of the above stated reasons, the Commissioners request that the copper limits remain at 67 µg/l average monthly and 89 µg/l maximum daily.

RESPONSE B4:

There was a difference in the way that reasonable potential was calculated for metals between the Hardwick permits and the Barre permit. The major difference was that the reasonable potential analyses done for metals in the Hardwick fact sheets did not account for upstream receiving water (background) concentrations of the pollutants, whereas the procedures used in the Barre fact sheet did account for background concentrations. The procedures used in the Barre permit are more in accordance with EPA guidance as presented in the *NPDES Permit Writer's Manual*[2] and the *Technical Support Document for Water Quality-based Toxics Control*[3].

For this reason, we have re-done the copper and aluminum reasonable potential analyses for the Hardwick facilities using the same procedures used in the Barre WWTF,

[2] http://cfpub.epa.gov/npdes/writermanual.cfm
[3] EPA's Technical Support Document for Water Quality-Based Toxics Control, March 1991, EPA/505/2-90-001,

incorporating background metal concentrations in the analysis. No limits were added to either final permit because there was no reasonable potential to exceed water quality criteria in the receiving water. Supporting calculations may be found in the Response to Comments for those permits, which were released publicly with the final permit[4].

With regard to the Ware WWTP, EPA is currently drafting a reissued permit for this facility, and the draft permit will contain limits and reasonable potential analysis consistent with those included in the Barre permit.

COMMENT B5:

Proposed Effluent Limit for Total Aluminum = 87 µg/l

The Commissioners strongly object to the imposition of an effluent limit for total aluminum. The last four consecutive whole effluent toxicity tests prove that the discharge from the BWWTF is not toxic to aquatic life. These tests were performed after the optimization of coagulant dose and feed location which resulted in substantial improvement in phosphorus and copper removal from the wastewater.

RESPONSE B5:

See Responses B2 and B3. As with copper, the aluminum limit was determined from analysis of the instream and effluent data provided by Barre, which showed that the discharge had the reasonable potential to exceed the state water quality criterion. The limit was established to ensure that the applicable water quality criterion is achieved. Compliance with whole effluent toxicity tests does not support removal of necessary chemical-specific limits for the reasons described in Response B3.

No site-specific criteria for the Ware River have been developed for aluminum. In the absence of site-specific criteria, the Region appropriately based the aluminum limit on the relevant criterion in the *National Recommended Water Quality Criteria: 2002*.

However, we have added a Compliance Schedule of 48 months for the aluminum limit to the final permit to give the Town time to evaluate sources of aluminum in the treatment system and to evaluate alternatives in meeting the limit. In addition, the final permit requires the Town to submit progress reports every 12 months describing actions taken to meet the permit limit during the previous 12 months. Such schedules are authorized by Massachusetts Water Quality Standards for "limitations that are based on new, newly interpreted or revised water quality standards…" [see 314CMR4.03(1)(b)].

MassDEP is currently studying the possibility of site specific aluminum criteria or statewide aluminum criteria. If the Town wishes to pursue site-specific criteria or to encourage Massachusetts to develop new statewide aluminum criteria, then we suggest that the Town contact MassDEP on this issue. We are happy to provide any guidance and

[4] Final permits and Responses to Comments are posted at http://www.epa.gov/region1/npdes/index.html

assistance that we can if the Commonwealth determines it appropriate to pursue either of these approaches.

However, we cannot wait for such a process to commence to set an effluent limitation for aluminum in light of our obligation under the CWA to ensure attainment of state water quality standards. The Region's decision to move forward with an effluent limit for aluminum at this time is consistent with the CWA and EPA's regulations, which provide for the reissuance of permits on a regular basis so that permit terms are revisited and reviewed rather than left unexamined and unchanged for long periods of time. *See* 33 USC §§ 1342(a)(3) and (b)(1)(B), and 40 C.F.R. § 122.46(a). This regular and periodic review supports the CWA's goal of restoring and maintaining the chemical, physical and biological integrity of the Nation's waters.

In the event that subsequent sampling shows that aluminum concentrations in the Ware River and in the discharge are less than the chronic criteria, the permittee may request a modification of the effluent limit. At least four instream samples and twelve effluent samples (one year of data) would be the minimum number of samples necessary to support such a modification request.

COMMENT B6:

The Commissioners are equally concerned with the fact none of the three municipal wastewater treatment facilities that discharge to the Ware River downstream of the BWWTF have any discharge limitations on aluminum. This might be understandable if these permits were anticipated to be renewed in the near future. However, the comment period for the two discharge permits for the Town of Hardwick just closed last month. Therefore, these permits are likely to go into effect shortly, if they haven't already.

The permit writer for the draft discharge permit for the BWWTF employed a similar methodology for calculating the proposed aluminum limit as was used to calculate the proposed copper limit. The permit writer stated that the "the freshwater aluminum aquatic life criteria in the National Recommended Water Quality Criteria: 2002 are a chronic criterion of 87 µg/l and an acute criterion of 750 µg/l". The aluminum levels in the BWWTF effluent were then compared to aluminum levels in the Ware River upstream of the BWWTF discharge.

The fact sheet then concludes that:

Accordingly, a monthly average effluent limit of 87 µg/l has been included in the draft permit to ensure that the discharge does not cause or contribute to a violation of Massachusetts Water Quality Standards."

As was in the case in determining a proposed copper limit, the Commissioners believe that this methodology for setting a proposed discharge permit limitation for aluminum was misapplied and is patently unfair to the Town of Barre since no such limit was applied in permits for three downstream wastewater treatment facilities.

For all of the above stated reasons, the Commissioners request that the proposed aluminum limit be removed from the permit and remain as reportable.

RESPONSE B6:

As described in Response B5, we have re-done the aluminum reasonable potential analysis for Hardwick-Gilbertville and Hardwick-Wheelright, taking into account background aluminum concentrations. Details of these analyses may be found in the Response to Comment for each final permit, which are posted on the EPA Region 1 website[5]. Using the same procedure as in Barre, we found that there was no reasonable potential for either of the Hardwick discharges to cause or contribute to an exceedance of the aluminum criteria. This is due to the fact that the aluminum concentration discharged by both facilities is less than 87 μg/L, the applicable chronic water quality criterion.

With regard to the Ware WWTP, EPA is currently drafting a reissued permit for this facility, and the draft permit will contain limits and reasonable potential analysis consistent with those included in the Barre permit.

COMMENT B7:

It is important to note that the Commissioners are committed to continuing to provide high quality treatment prior to discharge of effluent to the Ware River. However, this continued high degree of treatment requires a substantial commitment on the Town's limited resources. The imposition of stricter discharge limits will place an undue burden on those limited resources.

RESPONSE B7:

We acknowledge the commitment of the Town to high quality wastewater treatment and also that such treatment entails a significant financial commitment. The Clean Water Act does not allow for cost considerations in setting water quality-based permit limits; however, we have included a Compliance Schedule of 48 months for the Town to implement source reduction, evaluate treatment alternatives, and explore the possibility of alternative water criteria with MassDEP.

4. COMMENTS FROM MASSDEP

COMMENT C1:

Influent sampling is not necessary for TKN and NO2-NO3 (footnote 4). This would be part of the optimization study and not needed for a continuing permit requirement.

[5] http://www.epa.gov/region1/npdes/index.html

RESPONSE C1:

The draft permit requires influent sampling for nitrogen because the levels of total nitrogen in the effluent are often much higher than usual for POTWs, mainly due to high ammonia concentrations. Influent sampling for nitrogen compounds will help the facility better manage and possibly reduce its nitrogen loading to the Ware River, and hopefully resolve periodic whole effluent toxicity.

COMMENT C2:

The Department recognizes that the permit condition at Part 1, Section C.4 is a new requirement and the 30-month compliance schedule in which to complete all collection system mapping may not be sufficient in all cases. Technical knowledge and capacity to perform this work may need to be supported initially to accomplish these goals, and some permittees may want to coordinate this work with separately required stormwater collection system mapping requirements expected during the permit term. Initial feedback from a variety of permittees indicated that 48 months may be needed to accomplish this task, aligning the results with the permit compliance evaluation cycle. The Department supports a deadline of 48 months to reasonably accomplish this task.

However, if at any time before the current schedule has expired, the permittee determines compliance with the current schedule will not be met, the permittee may submit in writing a request to both agencies to change the deadline in accordance with the regulatory provisions of each agency through permit modification establishing an alternative schedule. Such request must include: a) specific reasons why the extension is necessary; b) documentation dating the progress made to date; c) a proposed alternative date for completing the work; and d) any other relevant information supporting the request for a modified schedule.

RESPONSE C2:

EPA believes that the 30-month schedule for completing the required mapping included in the draft permit is reasonable and notes that the permittee submitted no comments regarding this schedule during the public comment period. The 30-month schedule has been included in the final permit.

EPA acknowledges that EPA's recent draft NPDES municipal stormwater general permit for affected Massachusetts municipalities contains storm sewer mapping requirements as a component of the illicit discharge detection and elimination program, and that municipalities may want to conduct storm sewer mapping in conjunction with sewer system mapping. We do note however that 2010 Census information indicates that the Town of Barre is not required to seek coverage under the Municipal Separate Storm Sewer System (MS4) permit because there are no urbanized areas within its municipal boundary.

Nevertheless, EPA generally agrees with MassDEP that if the permittee submits information showing that despite its best efforts it is unable to complete the required sewer system mapping within the specified period (e.g. if field work for both sewer system mapping and collection system mapping is longer than for mapping the sewer system alone), EPA may allow a reasonable extension of the schedule. However, EPA will not be inclined to grant extensions to municipalities that seek schedule extensions that are based on a delay in initiating collection system mapping because they were awaiting issuance of the municipal stormwater permit.

COMMENT C3:

Change I.F.c. to read "Copies of toxicity test and nitrogen optimization reports only:" for DWM-Worcester.

RESPONSE C3:

The requested change has been made. In addition, the language has been changed to include submission of copper and aluminum progress reports that were added to the permit along with the compliance schedule. The portion of Part I. F. c. that addresses submittals to Mass DEP's Surface Water Permit Program now reads (changes shown in italic):

> Copies of whole effluent toxicity tests, copper and aluminum progress reports, and nitrogen optimization reports shall also be submitted to the State at the following address:
>
> **MassDEP**
> **Surface Water Permit Program**
> **627 Main Street, 2nd floor**
> **Worcester, MA 01608**

COMMENT C4:

The Fact Sheet does not mention the significant changes to the collection system operation requirements. Any change to the permit should be explained in the fact sheet.

RESPONSE C4:

This section was left out of the Fact Sheet in error, however, the proposed collection system operation and maintenance requirements were clearly presented in the draft permit.

The fact sheet is written to explain the conditions and requirements of the draft permit and is not re-written as part of the final permit decision. However, the comment and this response are part of the permit administrative record.

COMMENT C5:

The Fact Sheet does not mention the changes to the reporting system requirements. The fact sheet should serve to draw attention to these new requirements.

RESPONSE C5:

We disagree with the statement that the Fact Sheet did not discuss new reporting system requirements. Section 10 of the Fact Sheet discusses NetDMR filing requirements at length, including deadlines, opt-out provisions, and requirements for submittal of hard copy reports to MassDEP. This is standard language that is included in all Fact Sheets written by EPA Region 1.

COMMENT C6:

The correct designated use assessment for this segment of the Ware River is "Supporting" for aquatic life, primary and secondary contact recreation, and aesthetics. Fish consumption was not assessed.

RESPONSE C6:

EPA acknowledges the comment, which is now part of the public record. The comment does not request any changes to the permit and EPA does not believe it affects any of the limits or condition established in the permit. As stated in Response C5, the Fact Sheet accompanies the Draft Permit and is not changed with the issuance of the Final Permit.

COMMENT C7:

The conversion factor for MGD to cfs is 1.547, not 1.53.

RESPONSE C7:

We agree that the correct conversion factor from MGD to cfs is 1.547. However, this correction does not change any of the dilution factors or calculations used to determine permit limits. The design flow of the Barre WWTF, calculated as 0.46 cfs, in the Fact Sheet with the incorrect conversion factor, is still 0.46 cfs with the corrected conversion factor.

Barre WWTP design flow = 0.3 MGD x 1.547 cfs/MGD = 0.46 cfs

COMMENT C8:

The formula for dilution factor is: (Facility Flow + 7Q10)/ Facility Flow.

The calculation should read: (0.46 + 7.71)/0.46

The ammonia limits have been calculated using 30Q10 for both summer and winter limits. This should be a topic for the next EPA/MassDEP coordination meeting March 21, 2012. The ammonia limits are also calculated based on effluent pH. Since the dilution factor is 17.8, this is too conservative.

RESPONSE C8:

The equation for calculating the dilution factor under 30Q10 flow conditions was incorrectly expressed in Appendix B of the Fact Sheet. The corrected dilution equation for summer ammonia discharges follows below.

Dilution Factor = (Facility Flow + 30Q10)/Facility Flow
Dilution Factor = (11 cfs + 0.46 cfs)/0.46 cfs = **25**

We also agree that the ammonia reasonable potential calculation should be done using 30Q10 rather than 7Q10, and that the receiving water pH rather than the effluent pH should be used in the calculation.

The corrected criteria determination and reasonable potential calculation are attached as Appendix B. Because no reasonable potential exists for the discharge to cause or contribute to an exceedance the ammonia criteria, we have changed the effluent limit to a reporting requirement.

Although there is not an ammonia effluent limit in the final permit, high discharges of ammonia may cause violations of other limits. These include the annual total nitrogen mass loading limit of 63 lbs/day required by the Long Island TMDL and whole effluent toxicity limits. From prior WET tests, it appears that effluent ammonia concentrations approximately 14 mg/l and higher may cause acute toxicity that exceeds WET limits.

COMMENT C9:

Correct the quote for the narrative nutrient water quality criteria to the 2007 standards.

RESPONSE C9:

This document will serve as notification of the correct quotation and will be added to the Facility's administrative file. The corrected paragraph reads as follows.

> ***The Massachusetts Surface Water Quality Standards (314 CMR 4.00) do not contain numerical criteria for total phosphorus. The narrative criteria for nutrients is found at 314 CMR 4.05(5) (c), which states that "all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses." The Standards also require that "[a]ny existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be***

provided with the most appropriate treatment as determined by the Department, including, where necessary, highest and best practical treatment (HBPT) for POTWs and BAT for non POTWs, to remove such nutrients to ensure protection of existing and designated uses" (314 CMR 4.04). MassDEP has established that a monthly average total phosphorus limit of 0.2 mg/l (200 µg/l) represents highest and best practical treatment for POTWs.

COMMENT C10:

The phosphorus discussion refers to samples taken at the USGS gage at Cold Springs 01173000, but that sample was actually taken at station WAWV, which is downstream of Powder Mill Pond. At station CBG, the one sample collected was 0.02 mg/l. The upstream station may be a better indication of river phosphorus concentrations.

RESPONSE C10:

The Fact Sheet incorrectly stated that the upstream phosphorus data was collected at USGS Gage 01173000. The data was collected at WAWV downstream of Powder Mill Pond.

We disagree that the upstream station CBG would have been preferable to WAWV. CBG is just upstream of the Powdermill Dam/Martone Landfill, while WAWV is just downstream of the Powdermill Dam/Martone Landfill. Thus, WAWV is closer to Barre WWTF than CBG. The location of each monitoring station in relation to Barre WWTF is shown on the revised Figure 1, attached to this Response to Comments document.

Furthermore, there are six data points for total phosphorus at WAWV, as opposed to just one for CBG. Having six data points lets us evaluate how phosphorus fluctuates throughout the growing season and compare flow with phosphorus concentrations to ensure that our limits are protective during low flow conditions, as required by the Massachusetts Water Quality Standards (314 CMR 4.03(3)(a)).

COMMENT C11:

On the copper limits, the Massachusetts WQS at 314 CMR4.05(5)e state that "where the Department determines that naturally occurring background concentrations are higher, those concentrations shall be the allowable receiving water concentrations. This would change the limits for 4.4 mg/l average monthly and 6.9 µg/L maximum daily.

On the aluminum limits, the same standard would give an average monthly limit of 112 µg/L.

RESPONSE C11:

The "natural conditions clause" in the MA WQS is a narrative criteria that, when applied, replaces the numeric criteria. Replacement of a numeric criterion with a less stringent

criterion is a standards revision and is subject to the same public notification and EPA review process as other water quality standards revisions. It is a determination that cannot take place within the context of a permit reissuance.

As stated in Responses B2 and B5, EPA MassDEP may develop site specific criteria or revise statewide criteria based on sound scientific rationale. We are aware that an effort is underway to develop site-specific aluminum criteria. We are happy to provide any guidance and assistance that we can if the Commonwealth determines it appropriate to pursue this approach.

COMMENT C12:

In Appendix B, the formula for summer ammonia uses 7Q10, but the values are the 30Q10. If the agencies decide to use 30Q10 to calculate the dilution factor in the summer, the formula for dilution factor is: (Facility Flow + 30Q10)/Facility Flow, and the calculation would be (0.46 cfs + 11 cfs)/0.46 cfs.

RESPONSE C12:

See Response C9.

COMMENT C13:

The effluent concentration necessary to meet the summer chronic criterion calculation in the box uses the 7Q10 flow.

RESPONSE C13:

See Response C9.

COMMENT C14:

The winter dilution factor calculation should be corrected to read: (Facility Flow + 30Q10)/ Facility Flow, and the calculation would be (0.46 cfs + 60.2 cfs)/0.46 cfs .

RESPONSE C14:

We acknowledge the error in the expression of the dilution equation. However, the calculation itself was correct (see below) and because the dilution factor itself was not used to determine reasonable potential, no changes to the permit are needed.

Dilution Factor = (Facility Flow + 7Q10)/facility flow
Dilution Factor = (60.2 cfs + 0.46 cfs)/0.46 cfs = **132**

The dilution factor of 132 presented in the Fact Sheet was therefore correct, even though the equation was expressed incorrectly.

5. COMMENTS FROM THE CONNECTICUT RIVER WATERSHED COUNCIL

COMMENT D1:

According to the Fact Sheet, the Barre WWTP is a 0.3 mgd (million gallons/day) secondary wastewater treatment facility that serves a population of 3,000 and two industrial users, a landfill and a machine shop. The Fact Sheet does not provide any information on infiltration and inflow (I/I).

RESPONSE D1:

According to the permit application, the infiltration and inflow rate is 20,000 gallons per day, or 6.7% of design flow.

COMMENT D2:

Figure 1 of the Fact Sheet shows the supposed location of the facility. However, it is the exact same location identified in the Fact Sheet for the Hardwick-Wheelright Water Pollution Control Facility. One of them is wrong. Based on aerial maps and the address listed in the permit, we think the Barre WWTP might be located upstream of the location on the map, closer to the area identified as Barre Plains in upper right corner of the map. Please verify that the new 7Q10 calculations and any other details that might be affected by the location of the plant are based on the correct location of the facility.

RESPONSE D2:

EPA acknowledges the error on the map. The 7Q10 calculations in the draft permit were based on the correct location of Barre WWTF.

A corrected version of Figure 1 is included with this document.

COMMENT D3:

CRWC supports the use of a more accurate 7Q10 calculation at this site. Flow information at the Ware River at Intake Works Near Barre, MA gage was used in this calculation. The USGS web page for real-time data at this site indicates discharge values at this site do not include withdrawals from the Massachusetts Water Resources Authority's (MWRA's) Ware River intake between October 15 to June 14 each year. The intake is upstream of the Barre WWTP. Although the diversions occur during a time of year unlikely to experience the lowest flows, EPA might want to take this complex flow information into account in its calculation.

RESPONSE D3:

Because the diversions only occur during months of the year when the river would likely not be experiencing low flows, we did not account for them. Also, water is only withdrawn when flows on the Ware River are above 85 MGD. According to the MWRA website (http://www.mwra.state.ma.us/04water/html/wsupdate.htm):

> *Water can be drawn from the Ware River if needed. When the Ware River flow is above 85 mgd during the period from October 15 to June 15, withdrawals are sent to the Quabbin Reservoir.*

The Ware River 7Q10 at the Intake Works is 5.84 cfs (3.8 MGD). In other words, withdrawals only occur when the Ware River is 22 times its 7Q10 level. This withdrawal would have little to no effect on the 7Q10, since the 7Q10 is determined from low flow data, and high flows have little influence on the analysis. Therefore, the 7Q10 calculations have not changed.

COMMENT D4:

CRWC supports the addition of new permit limits for ammonia-nitrogen, dissolved oxygen, total aluminum, and a chronic toxicity test. We support the lowering of limits for total phosphorus (seasonal) and total copper, as well as increased monitoring for nitrogen compounds and total copper, inclusion of a new permit limit for total phosphorus, and increased frequency in monitoring of total phosphorus from once per month to once per week and nitrogen compounds from twice per year to once per quarter. We think these measures are appropriate, given the revised 7Q10 calculation and the effluent violations experienced at the plant.

RESPONSE D4:

EPA acknowledges the comment, which is now part of the administrative record. As stated elsewhere in this document, the dissolved oxygen and ammonia limits have been removed because we found upon further examination that these two parameters in the discharge did not have reasonable potential to cause or contribute to an exceedance of water quality standards in the receiving water. See Responses B1 and C9.

COMMENT D5:

EPA has chosen to add a limit for dissolved oxygen in the permit, but there is no specific mention why this was added in the Fact Sheet.

RESPONSE D5:

The dissolved oxygen limit has been removed from the permit. See Response B1.

COMMENT D6:

CRWC supports the addition of Special Condition #2 in Section E of the permit, requiring the facility to develop and implement a maximum allowable industrial headworks loading for ammonia. This requirement is aimed at helping the facility reduce ammonia levels in the treated effluent.

RESPONSE D6:

EPA acknowledges the comment, which is now part of the administrative record. This new requirement should ensure that the discharge of ammonia does not cause exceedances of whole effluent toxicity limits, cause operational upsets or cause violations of water quality standards.

6. COMMENTS FROM U.S. REPRESENTATIVE JOHN OLVER

COMMENT E1:

Recently I was contacted by the Town of Barre with concerns regarding new limits to be imposed as their NPDES Permit is renewed. Enclosed is a copy of their concerns. Please extend to the town your full and fair consideration.

RESPONSE E1:

In response to the town's comments, the dissolved oxygen limit has been removed from the final permit, and the sludge conditions have been revised to clarify that facilities sending sludge to municipal landfills are not subject to 40 CFR 503. EPA has also placed 48-month compliance schedules on the total copper and total aluminum limits to provide Barre WWTF some time to achieve source reductions and evaluate treatment alternatives.

7. COMMENTS FROM STATE SENATOR STEPHEN M. BREWER

COMMENT F1:

It is my understanding that the Sewer Commissioners would like the EPA to reconsider the proposed effluent limits for dissolved oxygen, total copper, and total aluminum as well as an adjustment of the sludge disposal requirements to better reflect current practices. It is my additional understanding that the Sewer Commissioners strongly believe they are providing high quality treatment prior to discharge of the effluent into the Ware River and respectfully request you reconsider these proposals (see enclosure). I would greatly appreciate if you would keep me apprised of any developments in this regard.

RESPONSE F1:

In response to the Town's comments, the dissolved oxygen limit has been removed from the final permit, and the sludge conditions have been revised to clarify that facilities sending sludge to municipal landfills are not subject to 40 CFR 503. EPA has also placed 48-month compliance schedules on the total copper and total aluminum limits to provide Barre WWTF some time to achieve source reductions and evaluate treatment alternatives.

8. COMMENTS FROM STATE REPRESENTATIVE ANNE M. GOBI

COMMENT G1:

On behalf of the Town of Barre, Board of Sewer Commissioners, I would like to offer my support for NPDES Permit No. MA0103152. The Town of Barre is committed to providing high quality treatment prior to discharge of effluent into the Ware River. However, all regulations should be consistent throughout the region, and the Town of Barre should not need to comply with regulations that are more strict than necessary to achieve the regional goals. While high quality of treatment is important, it will place an undue burden on a community that has limited resources during difficult economic times.

RESPONSE G1:

In response to the Town's comments, the dissolved oxygen limit has been removed from the final permit, and the sludge conditions have been revised to clarify that facilities sending sludge to municipal landfills are not subject to 40 CFR 503.

We have re-evaluated the metals analysis for the two Hardwick permits using the same method used in the Barre permit. The two Hardwick facilities do not require copper or aluminum limits because the level of these metals in their effluent does not violate water quality standards. Regarding the Ware WWTP, EPA is using the same method as in Barre in the upcoming reissuance of that permit.

Finally, EPA has placed 48-month compliance schedules on the total copper and total aluminum limits to provide Barre WWTF some time to achieve source reductions and evaluate treatment alternatives. We do not believe that this permit will place an undue economic burden on the town.

Appendix A

Summer Ammonia Criteria (at 24 C and pH 6.7, salmonids present, early fish life stages present)[6]

Acute: 29.8 mg/l
Chronic: 3.5 mg/l

Winter Ammonia Criteria (at 0 C and pH 6.5, salmonids present, early fish life stages present)[5]

Acute 32.6 mg/l
Chronic 6.67 mg/l

pH Data from Whole Effluent Toxicity Tests (used in determining water quality criteria)

Date	Effluent pH	Ambient pH
2/15/2007	7.9	6
5/10/2007	7.4	6.1
8/9/2007	7.7	6.9
11/8/2007	7.6	7
2/14/2008	7.3	6.2
5/15/2008	7.3	6.8
8/14/2008	7.5	6.5
11/13/2008	7.5	6.5
2/12/2009	7.6	6.3
5/14/2009	7.4	6.5
8/13/2009	7.5	6.6
11/12/2009	8	7.2
2/11/2010	7.7	6.7
5/13/2010	6.9	6.8
8/12/2010	7.8	7.5
11/11/2010	7	7.2
2/10/2011	7	6
May/Aug median	7.45	6.7
Nov/Feb median	7.6	6.5

[6] Pages 86-87 of 1999 Update of Ambient Water Quality Criteria for Ammonia (EPA-822-R-99-014)

Reasonable Potential Analysis for Summer Ammonia Discharges

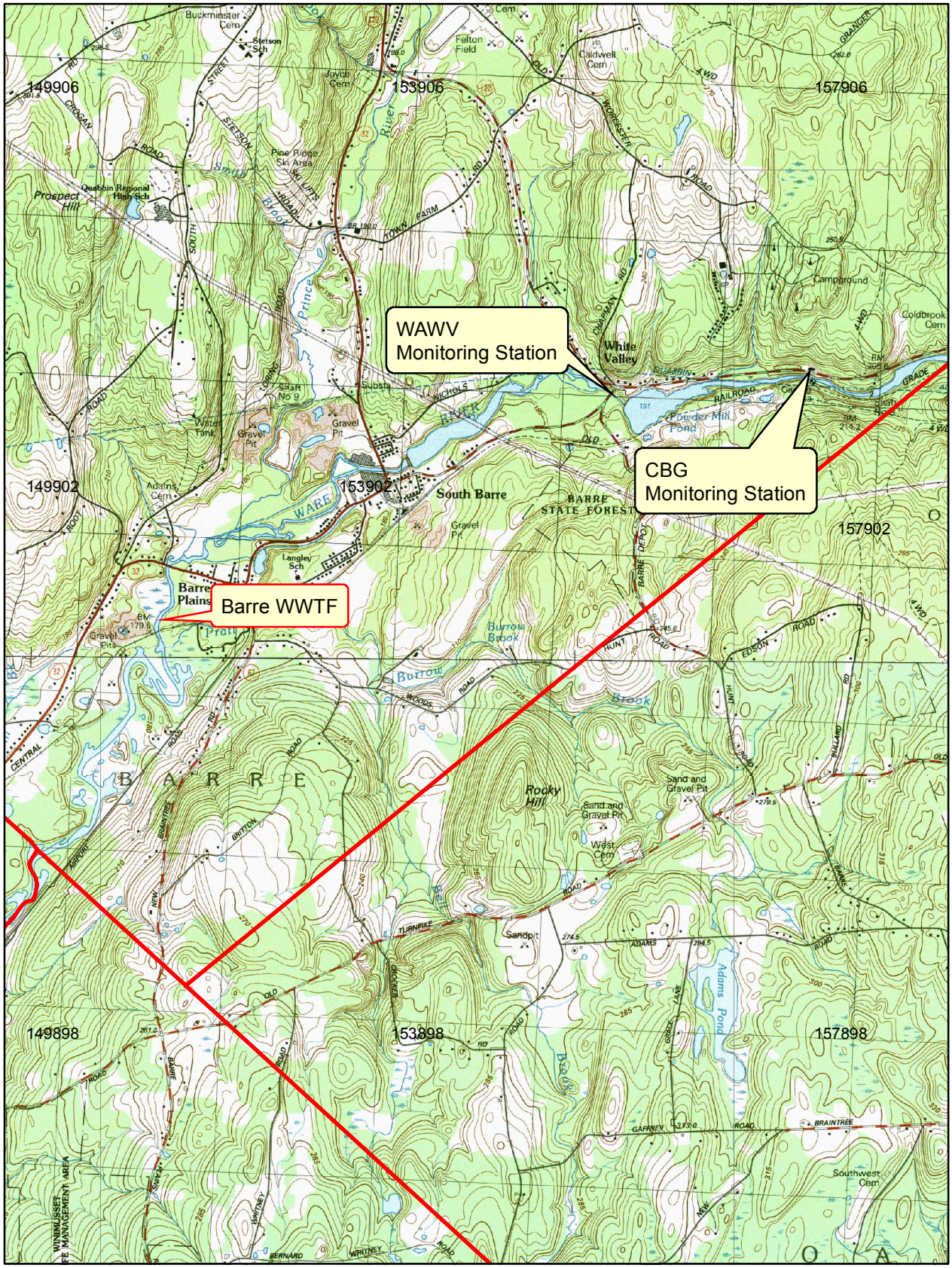
$$Q_sC_s = Q_dC_d + Q_rC_r$$

Q_s = receiving water flow = $Q_r + Q_d$	= 11 cfs + 0.46 cfs = 11.46 cfs
C_s = receiving water concentration	= ?
Q_d = effluent flow, i.e. facility design flow	= 0.46 cfs
C_d = effluent pollutant concentration	= 70 mg/l (highest data point)
Q_r = 30Q10 flow of receiving water	= 11 cfs
C_r = upstream concentration	= 0.13 mg/l

$$C_s = \frac{(0.46 \text{ cfs} \times 70 \text{ mg/l}) + (11 \text{ cfs} \times 0.13 \text{ mg/l})}{11.46 \text{ cfs}}$$

C_s = 2.93 mg/l < 3.5 mg/l (summer chronic criterion) and < 29.8 (summer acute criterion).

There is **no** reasonable potential for the discharge to cause or contribute to an exceedance of the chronic water quality criterion during the summer.



1 inch = 3,000 feet

EPA

Figure 1
Barre WWTF Location Map