

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 Milford

is authorized to discharge from the facility located at

**Milford Wastewater Treatment Facility
Route 140
Hopedale, MA 01747**

to receiving water named

Charles River (Charles River Watershed)

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

This permit shall become effective on the date of signature if no comments are received during public notice. If comments are received during public notice, this permit will become effective on the first day of the calendar month following sixty (60) days after the date of 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 February 10, 2005.

This permit consists of 12 pages in Part I, which includes effluent limitations and monitoring requirements, and Attachment A, Chronic Freshwater Toxicity Test Procedures and Protocols, and 25 pages in Part II, which includes General Conditions and Definitions.

Signed this 9th day of November, 2010

/S/SIGNATURE ON FILE

Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA

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

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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

<u>Effluent Characteristic</u>	<u>Units</u>	<u>Discharge Limitation</u>			<u>Monitoring Requirement</u>	
		<u>Average Monthly</u>	<u>Average Weekly</u>	<u>Maximum Daily</u>	<u>Measurement Frequency</u> ⁴	<u>Sample Type</u> ⁴
Flow ²	MGD	4.3	----	Report	Continuous	Recorder
Flow ²	MGD	Report	----	----		
BOD ³ ₅ (November 1 through April 30)	mg/l lbs/day	30 1077	45 1614	Report Report	3/Week 3/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
BOD ³ ₅ (May 1 through October 31)	mg/l lbs/day	7 251	7 251	Report Report	3/Week 3/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
TSS ³ (November 1 through April 30)	mg/l lbs/day	30 1077	45 1614	Report Report	3/Week 3/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
TSS ³ (May 1 through October 31)	mg/l lbs/day	7 251	7 251	Report Report	3/Week 3/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
pH ¹		6.5-8.3 (See Condition I.A.1.b.on Page 5)			1/Day ⁵	Grab
Dissolved Oxygen	mg/l	NOT LESS THAN 6			1/Day ⁵	Grab
Fecal Coliform Bacteria ^{1,6} (April 1 through November 30)	cfus/100 ml	200	----	400	3/Week	Grab
Escherichia Coli Bacteria ^{1,6} (April 1 through November 30)	cfus/100 ml	126	----	409	3/Week	Grab

<u>Effluent Characteristic</u>	<u>Units</u>	<u>Discharge Limitation</u>			<u>Monitoring Requirement</u>	
		<u>Average Monthly</u>	<u>Average Weekly</u>	<u>Maximum Daily</u>	<u>Measurement Frequency</u> ⁵	<u>Sample Type</u> ⁴
Total Chlorine Residual ^{1,7}	ug/l	11	----	19	1/Week	24-Hour Composite ⁵
Total Ammonia Nitrogen, as N, (May 1 through May 31)	mg/l lbs/day	5 179	5 179	8 287	2/Week 2/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
Total Ammonia Nitrogen, as N, (June 1 through October 31)	mg/l lbs/day	1.0 36	1.0 36	1.5 54	2/Week 2/Week	24-Hour Composite ⁵ 24-Hour Composite ⁵
Copper, Total ⁸	ug/l	12	----	18	1/Month	24-Hour Composite ⁵
Lead, Total	ug/l	4	----	----	1/Month	24-Hour Composite ⁵
Phosphorus, Total (April 1 through October 31)	ug/l	100	----	----	2/Week	24-Hour Composite ⁵
Phosphorus, Total (November 1 through March 31)	ug/l	300	----	----	1/Week	24-Hour Composite ⁵
Orthophosphate November 1 through March 31)	mg/l	Report	----	----	1/Week	24-Hour Composite ⁵
Aluminum, Total	ug/l lbs/day	89 3.19	----	765 27.3	1/Month 1/Month	24-Hour Composite ⁵ 24-Hour Composite ⁵
LC ₅₀ ^{10,12}	%	----	----	100	4/year ⁹	24-Hour Composite ⁵
Chronic NOEC ^{11,12}	%	----	----	≥ 98	4/year ⁹	24-Hour Composite ⁵

Footnotes:

1. Required for State Certification
2. Report annual average, monthly average, and 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. Sampling required for influent and effluent.
4. All sampling shall be representative of the effluent that is discharged through outfall 001 to the Charles River. A routine sampling program shall be developed in which samples are taken at the same location, same time and same day of every month. Any deviations from the routine sampling program shall be documented in correspondence appended to the applicable discharge monitoring report that is submitted to EPA.

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.

5. A 24 hour composite sample will consist of a least twenty-four (24) grab samples taken during one consecutive 24 hour period (e.g. 0700 Monday to 0700 Tuesday). Once per day (1/Day) is defined as one time each day, during regular business hours.
6. Fecal coliform bacteria discharges shall not exceed a monthly geometric mean of 200 colony forming units (cfu) per 100 ml, nor shall they exceed 400 cfu per 100 ml as a daily maximum. *E. coli* discharges shall not exceed a monthly geometric mean of 126 colony forming units (cfu) per 100 ml, nor shall they exceed 409 cfu per 100 ml as a daily maximum. The average monthly limits for fecal coliform bacteria and *E. coli* are expressed as geometric means.

The fecal coliform bacteria limits and monitoring requirements are in effect only for the duration of the first April 1- November 30 period following the effective date of the permit. For example, if the permit becomes effective on October 1, 2010, the fecal coliform limits and monitoring requirements will be in effect for only October and November 2010.

The *E. coli* monitoring requirements are in effect upon the effective date of the permit. The limits become effective on the April 1 following the end of the period in which the fecal coliform limits are effective. For example, if the permit becomes effective on October 1, 2010, the permittee shall monitor *E.coli* beginning in October 2010, but the limits will not become effective until April 1, 2011. The monitoring frequency for *E. coli* before the limits go into effect is 1/month. After the limits are in effect, the monitoring frequency is 3/week.

7. Total residual chlorine monitoring and reporting are required if chlorine is added to the treatment process for disinfection or other purposes. If chlorine is not added at any time during a reporting month, a no discharge code shall be reported on the discharge monitoring report for that month.

The minimum level (ML) for total residual chlorine is defined as 20 ug/l. This value is the minimum level for chlorine using EPA approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G. One of these methods must be used to determine total residual chlorine. For effluent limitations less than 20 ug/l, compliance/non-compliance will be determined based on the ML. Sample results of 20 ug/l or less shall be reported as zero on the DMRs.

8. The minimum detection level (ML) for copper is defined as 3.0 ug/l. This value is the minimum detection level for copper using the Furnace Atomic Absorption analytical method. For effluent limitations less than 3.0 ug/l, compliance/non-compliance will be determined based on the ML. Sample results of 3.0 ug/l or less shall be reported as zero on the Discharge Monitoring Report.
9. The permittee shall conduct chronic (and modified acute) toxicity tests four times per year. The chronic test may be used to calculate the acute LC₅₀ 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 January, April, July and October. The test results shall be submitted by the last day of the month following the completion of the test (February 28th, May 31st, August 31th and November 30th). The tests must be performed in accordance with test procedures and protocols specified in **Attachment A, Chronic Freshwater Toxicity Test Procedures and Protocols** of this permit.

Test Dates Second week	Submit Results By:	Test Species	Acute Limit LC ₅₀	Chronic Limit C-NOEC
January April July October	February 28 th May 31 st August 31 th November 30 th	<u>Ceriodaphnia dubia</u> (daphnid) See Attachment A	≥ 100%	≥ 98%

10. The LC₅₀ is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.
11. 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 at a specific time of observation as determined from hypothesis testing where the test results exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect. The "98% or greater" limit is defined as a sample which is composed of 98% (or greater) effluent, the remainder being dilution water.
12. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A (Toxicity Test Procedure and Protocol) Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance which may be used to obtain automatic

approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found on the EPA, Region I web site at <http://www.epa.gov/region1/enforcementandassistance/dmr.pdf>. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance will be transmitted to the permittees. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachment A**.

Part I.A.1 (continued)

- a. The discharge shall not cause an excursion of the water quality standards of the receiving waters.
- b. The pH of the effluent shall not be less than 6.5 nor greater than 8.3 at any time.
- c. The discharge shall not cause objectionable discoloration of the receiving waters.
- d. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.
- e. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal shall be based on monthly average values.
- f. 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, 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.

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

- a. Any new introduction of pollutants into that POTW from an indirect discharger which 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:

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

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

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall listed in Part I A.1. of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) are not authorized by this permit and shall be reported 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 MassDEP 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:

1. Maintenance Staff

The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit.

2. Preventative Maintenance Program

The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized

discharges.

3. Infiltration/Inflow Control Plan:

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

The plan shall include:

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

Reporting Requirements:

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

- A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year.
- Expenditures for any infiltration/inflow related maintenance activities and corrective actions taken during the previous year.
- A map with areas identified for I/I-related investigation/action in the coming year.
- A calculation of the annual average I/I and the maximum month I/I for the reporting year.
- A report of any infiltration/inflow related corrective actions taken as a result of unauthorized discharges reported pursuant to 314 CMR 3.19(20) and reported pursuant to the Part I.B. Unauthorized Discharges section of this permit.

4. Alternate Power Source

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

D. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.
2. The permittee shall comply with the more stringent of either the state or federal (40 CFR part 503), requirements.
3. The requirements and technical standards of 40 CFR Part 503 apply to facilities which perform one or more of the following use or disposal practices.
 - a. Land application - the use of sewage sludge to condition or fertilize the soil
 - b. Surface disposal - the placement of sewage sludge in a sludge only landfill
 - c. Sewage sludge incineration in a sludge only incinerator
4. The 40 CFR Part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions also do not apply to facilities which do not dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g. lagoons, reed beds), or are otherwise excluded under 40 CFR 503.6.
5. The permittee shall use and comply with the attached compliance guidance document to determine appropriate conditions. See Attachment B, EPA Region 1 NPDES Permit Sludge Compliance Guidance. Appropriate conditions contain the following elements.
 - General requirements
 - Pollutant limitations
 - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
 - Management practices
 - Record keeping
 - Monitoring
 - Reporting

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

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

less than 290	1/ year
290 to less than 1500	1 /quarter

1500 to less than 15000	6 /year
15000 +	1 /month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR Part 503.8.
8. The permittee shall submit an annual report containing the information specified in the guidance by February 19. Reports shall be submitted to the address contained in the reporting section of the permit. Sludge monitoring is not required by the permittee when the permittee is not responsible for the ultimate sludge disposal. The permittee must be assured that any third party contractor is in compliance with appropriate regulatory requirements. In such case, the permittee is required only to submit an annual report by February 19 containing the following information:
 - Name and address of contractor responsible for sludge disposal
 - Quantity of sludge in dry metric tons removed from the facility by the sludge contractor

E. MONITORING AND REPORTING

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

- a. Submittal of Reports Using NetDMR

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

DMRs shall be submitted electronically to EPA no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA, including the MassDEP Monthly Operations and Maintenance Report, as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees shall continue to send hard copies of reports other than DMRs (including Monthly Operation and Maintenance Reports) to MassDEP until further notice from MassDEP.

- b. Submittal of NetDMR Opt Out Requests

Opt out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under the Permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA

unless the permittee submits a renewed opt out request and such request is approved by EPA.
All opt out requests should be sent to the following addresses:

Attn: NetDMR Coordinator
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-1)
Boston, MA 02109-3912

And

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

c. Submittal of Reports in Hard Copy Form

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

U.S. Environmental Protection Agency
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-1)
Boston, MA 02109-3912

The State Agency addresses are:

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

Toxicity reports required by this permit shall also be submitted to the State at:

Massachusetts Department of Environmental Protection
Division of Watershed Management
Surface Water Discharge Permit Program
627 Main Street, 2nd floor
Worcester, MA 01887

F. 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.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND
5 POST OFFICE SQUARE – SUITE 100
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

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

NPDES PERMIT NO.: MA0100579

NAME AND ADDRESS OF APPLICANT:

**John Mainini
Director of Operations
Milford Wastewater Treatment Facility
P.O. Box 644
Milford, MA 01757**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Milford Wastewater Treatment Facility
Route 140
Hopedale, MA 01747**

RECEIVING WATER: **Charles River, Segment (MA72-03)**

CLASSIFICATION: **Class B, Warm Water Fishery**

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

The above named applicant has requested that the U.S. Environmental Protection Agency (EPA) reissue its NPDES permit to discharge into the designated receiving water. The facility is engaged in the collection and treatment of municipal wastewater. The discharge is from the Milford Wastewater Treatment Plant.

The existing NPDES permit was issued on February 10, 2005 and expired on February 10, 2010. The existing and draft permits authorize a discharge only from Outfall 001. The draft permit has been written to reflect the current operation and conditions at the facility.

II. Description of Discharge

A quantitative description of the treatment plant discharge in terms of significant effluent parameters based on recent monitoring data is shown in Table 1 of this fact sheet. The data in Table 2, Charles River Hardness downstream of the Milford WWTP and Table 3, Metal Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness Dependent are used in calculating the effluent limits for

metals in the draft permit.

Table 4, Effluent Chemistry Data from Whole Effluent Toxicity Tests Figure 1 of the fact sheet is a map showing the geographic location of the facility and Figure 2 is a diagram of the facility's flow process.

III. Limitations and Conditions

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

IV. Permit Basis and Explanation of Effluent Limitation Derivation

The Town of Milford operates a 4.3 million gallon per day (MGD) advanced wastewater treatment facility located in Hopedale, Massachusetts. It serves approximately 25,000 people in Milford and 500 people in Hopedale. There are no significant industrial users contributing wastewater to the plant. The collection system consists of separate sewers.

Wastewater arrives at the plant through two sewer lines and is measured in two Parshall flumes. The flows are combined and then chlorine and alum are added before entering the aerated grit chamber. Approximately 10,000 gpd of septage from the Towns of Milford, Bellingham and Holliston is added before the wastewater enters the grit chambers. Following grit removal, wastewater goes through two comminutors and a bar rack to three primary clarifiers. Sludge from primary treatment is pumped to the sludge thickener. Primary-treated wastewater then goes to three trickling filters for BOD₅ removal, and then pumped to intermediate clarifiers.

Wastewater flows from the intermediate clarifiers to the rotating biological contactors (RBCs) for biological treatment. The facility has six RBC trains. Lime is added to the RBC influent to assist with nitrification. Polyaluminum chloride (PAC) is added to the RBC effluent to enhance phosphorus removal in the final clarifiers. From the final clarifiers, wastewater is further treated in two sand filters. Treated wastewater is disinfected through an ultra-violet (UV) unit, aerated over a cascade and discharged to the Charles River.

POTW Discharges

Overview of Federal and State Regulations

General Requirements

EPA is required to consider both technology and water quality requirements when developing permit effluent limits. Technology based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Clean Water Act (see 40 CFR 125 Subpart A). For publicly owned treatment works, technology based requirements are effluent limitations based on secondary treatment as defined in 40 CFR Part 133.

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

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to

Section 304(a) of the CWA, be used unless a site specific criteria is established. Massachusetts Surface Water Quality Standards also require that discharges of pollutants to surface waters be limited or prohibited to assure that surface water quality standards of the receiving waters are protected and maintained or attained. 314CMR 4.03(1)(a)

Pursuant to 40 CFR 122.44(d)(1)(i), the permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that caused, has reasonable potential to cause, or contributes to an excursion above any water quality criterion. An excursion occurs if the projected or actual in-stream 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.

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirement of the CWA. EPA's anti-backsliding provisions, found in Sections 402(o) and 303(d)(4) of the CWA and at 40 CFR 122.44(l), prohibit the relaxation of permit limits, standards, and conditions, except under certain, limited conditions. Therefore, the effluent limits in the reissued permit must be at least as stringent as those in the previous permit, unless a relaxation is allowed under the provisions of the law and regulations.

Waterbody Classification and Usage

The effluent from the treatment plant is discharged to segment (MA72-03) of the Charles River. This segment of the River is classified as a Class B waterbody by the Massachusetts Department of Environmental Protection (MassDEP). Class B waters are designated as habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated, they shall be suitable as a source of public water supply with appropriate treatment. They 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 objective of the Federal Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. To meet this goal, the CWA requires states to develop information on the quality of their water resources and report this information to the U.S. Environmental Protection Agency (EPA), the U.S. Congress, and the public. To this end, the EPA released guidance on November 19, 2001, for the preparation of an integrated "List of Waters" that could combine reporting elements of both §305(b) and 303(d) of the CWA. The integrated list format allows the states to provide the status of all their assessed waters in one list. States choosing this option must list each water body or segment in one of the following five categories:

1) Unimpaired and not threatened for all designated uses; 2) Unimpaired waters for some uses and not assessed for others; 3) Insufficient information to make assessments for any uses; 4) Impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) Impaired or threatened for one or more uses and requiring a TMDL. Section 303(d) of the CWA requires states to identify and list those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such, require the development of Total Maximum Daily Load.

Segment MA72-03 of the Charles River, where the discharge occurs, is listed in Category 5 of the State's 2008 Integrated List of Waters. This segment of the river is not in attainment and requires a TMDL for the following pollutants: DDT, dissolved oxygen saturation, Escherichia coli, excess algal growth, organic enrichment biological indicators and total phosphorus.

Flow

The annual average flow limit in the draft permit is the same as in the existing permit, 4.3 MGD (6.65 cfs). Between the months of January 2007 to December 2009 the flow limit was exceeded 11 times. The range of 12 month average flows during the same time period was from 3.82 MGD and 4.70 MGD.

Available Dilution

A calculated available dilution is used to establish water quality-based effluent limits. For rivers and streams, Title 314 CMR 4.03(3)(a) requires that 7Q10 be used to represent the critical hydrologic condition at which water quality criteria must be met. The 7Q10 is the lowest observed mean river flow for 7 consecutive days recorded over a 10-year recurrence interval.

The 7Q10 for the Charles River at the Dover gaging station is 12.0 cfs, based on daily flow data from the USGS website at <http://waterdata.usgs.gov/nwis/> for the period from January 1981 through November 2009. The drainage area at the gage is 183 square miles, per the same website. The estimated drainage area at the point of discharge is 17 square miles.

$$7Q10 = 12.0 \text{ cfs}$$

Contributing low flows (August 7, 1999 through August 13, 1999) from upstream treatment plants

$$\text{Milford} = 3.64 \text{ cfs}$$

$$\text{CRPCD} = 5.38 \text{ cfs}$$

$$\text{Medfield} = 1.11 \text{ cfs}$$

$$\text{Wrentham Development Center} = 0.114 \text{ cfs}$$

$$\text{MCI} = 0.569 \text{ cfs}$$

$$\text{Total} = 10.81 \text{ cfs}$$

Base flow at Dover gage station

$$12.0 - 10.81 = 1.19 \text{ cfs}$$

Base flow per square mile of drainage area

$$1.19/183 = 6.50 * 10^{-3} \text{ cfs/mi}^2$$

7Q10 = Base flow at Milford

$$\text{Multiply } 6.50 * 10^{-3} * 17 = 0.111 \text{ cfs}$$

$$7Q10 = 0.111 \text{ cfs}$$

Dilution Factor

$$(0.111 + 6.65)/6.65 = 1.019 = 1.02$$

Permit Limits and Effluent Data

The limits for BOD₅, TSS, pH, the dissolved oxygen concentration, and bacteria are based on water quality considerations. These limitations have been established to achieve Massachusetts Water Quality Standards for Class B receiving water.

BOD₅, and TSS

The loading (lbs/day) and concentration (mg/l) limits for BOD₅, and TSS in the draft permit are the same as in the existing permit. The limits are more stringent than the technology-based secondary requirements found at 40 CFR Part 133. The proposed limits are based on a formal waste load allocation calculated for the Charles River by MassDEP. For a review of the waste load allocation, refer to "*The Charles River Basin 1976 Water Quality Management Plan*", chapters VI and VIII. The draft permit also contains BOD₅ and TSS percent removal limitations based on the requirements of 40 CFR 133. These limitations are the same as in the existing permit.

From January 2007 through December 2009, there were no exceedances of BOD₅, or TSS effluent limitations.

Dissolved Oxygen, and pH

The numerical limitations for dissolved oxygen (DO), and pH are based on state certification requirements under Section 401(a)(1) of the CWA, as described in 40 CFR 124.53 and 124.55, and will remain unchanged from limits in the existing permit.

Between January 2007 and December 2009, the minimum pH limit was exceeded twice. There was no dissolved oxygen exceedances reported.

Fecal coliform bacteria and *Escherichia coli* (*E. coli*) bacteria

On December 29, 2006 the State revised the bacteria criteria in its water quality standards for Class B waters, changing the criteria from fecal coliform bacteria to *Escherichia coli* (*E. coli*) bacteria. EPA approved this revision on September 19, 2007, and this change is reflected in the draft permit.

The fecal coliform limit will be in effect for the duration of the first disinfection season (April-November) following the effective date of the permit. After this period, limitations on *E.coli* bacteria will become effective, and the fecal coliform monitoring requirements and effluent limits will end. Fecal coliform limits in the draft permit are the same as in the existing permit; a monthly average geometric mean of 200 colony forming units per (cfus) 100 ml and a daily maximum geometric mean of 400 cfus per 100 ml. There have been no fecal coliform exceedances between January 2007 and December 2009.

The *E. coli* bacteria limitations proposed in the draft permit are a monthly average geometric mean of 126 colony forming units per 100 ml (cfu/ml) and a maximum daily value of 409 cfu/100 ml (this is the 90% distribution of the geometric mean of 126 cfu/ml). Prior to the limits becoming effective, the monitoring frequency is once per month. When the limits become effective, the monitoring frequency is three times per week.

Total Residual Chlorine (TRC)

Chlorine and chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. Figure 2, a diagram of the facility's flow process, shows that chlorine may be added at several points in the treatment process. Monthly average and maximum daily effluent limits for total residual chlorine have been added to the draft permit. The monitoring requirements are only in effect if chlorine is added to the treatment process for disinfection or any other reason (i.e. TRC sampling is not required if chlorine is not being added to the treatment process).

Total Residual Chlorine Limitations:

Daily Maximum Limit

(acute criteria * dilution factor) = (19 ug/l x 1.02) = 19.38 ug/l

Average Monthly Limit

(chronic criteria * dilution factor) = (11 ug/l x 1.02) = 11.22 ug/l

Metals

Relatively low concentrations of trace metals in receiving waters can be toxic to resident aquatic life species. EPA is required to limit any pollutant that is, or may be discharged at a level that caused, or has reasonable potential to cause, or contributes to an excursion above any water quality criterion. See 40 CFR 122.44(d)(1)(vi). Effluent metals data submitted with toxicity tests results and discharge monitoring reports were reviewed to determine if metals in the discharge have the potential to exceed aquatic life criteria in the Charles River.

The EPA recommended approach to set and measure compliance with water quality standards is to use dissolved metals, because dissolved metals more closely approximates the bioavailable fraction of metal in the water column than does total recoverable metal. Most toxicity to aquatic organisms is by adsorption or uptake across the gills which would require the metal to be in dissolved form. When toxicity tests were originally conducted to develop EPA's Section 304(a) metals criteria, the concentrations were expressed as total metals. Subsequent testing determined the percent of the total metals that is dissolved in the water column. The calculations that follow use the freshwater conversion factors to calculate the dissolved acute and chronic water quality criteria for metals (EPA National Recommended Water Quality Criteria: 2002).

However, the regulations in 40 CFR 122.45(c) require that the permit limits be based on total recoverable metals. The chemical differences between the effluent and the receiving water may cause changes in the partitioning between dissolved and particulate forms of metals. As the effluent mixes with the receiving water, adsorbed metals from the discharge may dissolve in the water column.

In this case, measuring dissolved metals would underestimate the impact on the receiving water, and an additional calculation, using a site-specific translator would determine total metal criteria. Based on EPA's Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion (EPA-823-B-96-007), the conversion factor is equivalent to the translator if site-specific studies for partitioning have not been conducted. In subsequent calculations, conversion from dissolved metals to total recoverable metals have been done using the conversion factor for the particular metal found in Appendix A of the National Recommended Water Quality Criteria: 2002, in lieu of a translator.

Hardness Dependent Metals

EPA's Office of Water - Office of Science and Water Technology stated in a letter dated July 7, 2000 that: "The hardness of water containing the discharged toxic metal should be used for determining the applicable criterion. Thus the downstream hardness should be used. The theoretical hardness of the Charles River downstream of the treatment plant under 7Q10 receiving water flow and design discharge flow was calculated based on ambient and effluent hardness data as shown in Table 2, Charles River Hardness downstream of the Milford WWTP, below as (reported as an equivalent concentration of calcium carbonate) reported in the 2008 and 2009 whole effluent toxicity test.

Table 2. Charles River Hardness downstream of the Milford WWTP

WET Test Date	Effluent Hardness, mg/l	Ambient Hardness, mg/l	Calculated Downstream Hardness, mg/l
10/09	140	57	129
07/09	130	41	118
10/08	150	48	137
07/08	190	120	181

Calculation of hardness in the receiving water:

In order to determine the hardness downstream of the treatment plant during the critical low flow periods, the effluent and ambient hardness values from whole effluent toxicity tests conducted in July and October were calculated using mass balance equations:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r}$$

Where:

- Q_s = 7Q10 river flow upstream of plant = 0.11 cfs = 0.645 MGD
- Q_d = Discharge flow from plant = 4.3 MGD
- Q_r = Combined river flow (7Q10 + plant flow)
- C_s = Upstream hardness concentration
- C_d = Effluent hardness
- C_r = Receiving water hardness downstream

Calculation:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r} = \frac{(4.3 \text{ MGD})(130 \text{ mg/l}) + (0.645 \text{ MGD})(41 \text{ mg/l})}{(4.3 \text{ MGD} + 0.645 \text{ MGD})} = 118.39 \text{ mg/l}$$

The downstream hardness of 118 mg/l from the above table was selected, as this would be the most protective of aquatic life during the warm weather months.

Water Quality Criteria for hardness-dependent metals (see equations below):

$$\text{Chronic criteria (dissolved)} = \exp\{m_c [\ln (\text{hardness})] + b_c\} \text{ (CF)}$$

Where : m_c = pollutant-specific coefficient

c = pollutant-specific coefficient
 h = hardness of the receiving water = 118 mg/l as CaCO_3
 \ln = natural logarithm

CF = pollutant specific conversion factor used to convert total recoverable to dissolved metal

Acute criteria (dissolved) = $\exp\{m_a [\ln(\text{hardness})] + b_a\}$ (CF)

Where:

- m_A = pollutant-specific coefficient
- b_A = pollutant-specific coefficient
- h = hardness of the receiving water = 118 mg/l as CaCO_3
- \ln = natural logarithm
- CF = pollutant specific conversion factor used to convert total recoverable to dissolved

Table 3. Metal Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness Dependent

	m_A	b_A	m_C	b_C	Freshwater Conversion Factors (CF)	
					Acute CF	Chronic CF
Copper	0.9422	-1.7	0.8545	-1.702	0.96	0.96
Lead	1.273	-1.460	1.273	-4.705	0.803	0.803
Nickel	0.8460	2.255	0.8460	0.0584	0.998	0.997
Cadmium	1.0166	-3.924	0.7409	-4.715	0.937	0.902
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

Copper

The current permit includes monthly average and daily maximum copper limits of 5.3 ug/l and 7.4 ug/l. These limits were calculated using the 1998 National Recommended Water Quality Criteria for copper using a hardness of 50 mg/l as CaCO_3 and a dilution factor of 1.02. However, a letter from EPA’s Office of Water - Office of Science and Water Technology dated July 7, 2000 stated that: “The hardness of water containing the discharged toxic metal should be used for determining the applicable criterion.” Thus the downstream hardness should be used. The hardness of the Charles River downstream of the treatment plant was calculated based on ambient and effluent hardness data collected from the 2008 and 2009 whole effluent toxicity test. In this case, the downstream hardness is higher than the hardness used in the existing permit. As a result, the draft permit’s limits for copper have increased slightly from the limits in the existing permit.

In December 2006, the Massachusetts Surface Water Quality Standards were revised to include site-specific copper criteria that were developed where national criteria are invalid due to site-specific physical, chemical, or biological considerations, and do not exceed the safe exposure levels determined by toxicity testing [314 CMR 4.05(5)(e) Table 28]. MassDEP has adopted an acute dissolved copper criteria of 25.7 ug/l and a chronic dissolved criteria of 18.1 ug/l for the Charles River from river mile 73.4 to 9.8. The point of discharge from the Facility is at river mile 5.4, therefore the site-specific criteria do not apply.

$CCC = \text{Chronic copper criteria (dissolved)} = \exp\{0.85452[\ln(118)] - 1.702\}(0.96) = 10.32 \text{ ug/l}$

Maximum Daily Effluent limitation:(CCC) (dilution factor) = (10.32)(1.02) = 10.53 ug/l (dissolved)

Total recoverable Limit = $10.53 \div (0.96) = 10.97 \text{ ug/l}$

CMC = Acute copper criteria (dissolved) = $\exp\{0.9422[\ln(118)] - 1.7\} (0.96) = 15.71 \text{ ug/l}$

Average Monthly Effluent limitation:(CMC) (dilution factor) = (15.71 ug/l) (1.02) = 16.02 ug/l (dissolved)

Total recoverable limit = $16.02 \text{ ug/l} \div (0.96) = 16.69 \text{ ug/l}$

Copper is monitored as part of the Facility's monthly discharge monitoring requirement. Table 1 of the fact sheet shows the range of concentration of copper in the effluent between January 2007 and December 2009 between 1.6 ug/l to 114 ug/l. There is a reasonable potential to cause or contribute to an exceedance in the chronic and acute in-stream criteria.

Lead

CCC = Chronic lead criteria (dissolved) = $\exp\{1.273 [\ln(118)] - 4.705\} (0.803) = 3.15 \text{ ug/l (dissolved)}$

Monthly Average Effluent limitation: (CCC) (dilution factor) = (3.15 ug/l) (1.02) = 3.22 ug/l (dissolved)

Total recoverable limit = $3.22 \text{ ug/l} \div (0.803) = 4.00 \text{ ug/l}$

CMC = Acute lead criteria (dissolved) = $\exp\{1.273[\ln(118)] - 1.460\} (0.803) = 80.94 \text{ ug/l}$

Maximum Daily Effluent limitation: (CMC) (dilution factor) = (80.94 ug/l) (1.02) = 82.56 ug/l (dissolved)

Total recoverable limit = $82.56 \text{ ug/l} \div (0.803) = 102.81 \text{ ug/l}$

Lead is monitored as part of the chemical analysis in the facility's quarterly toxicity testing and a review of the lead data indicates that there is a reasonable potential to cause or contribute to an exceedance in the chronic in-stream criteria. Lead data is shown below in Table 4. Effluent Chemistry Data from Whole Effluent Toxicity Tests. Therefore, a monthly average limit of 4.00 ug/l has been included in the draft permit.

Nickel

CCC = Chronic nickel criteria (dissolved) = $\exp\{0.8460 [\ln(118)] + 0.0584\} (0.997) = 59.82 \text{ ug/l}$

Average Monthly Effluent limitation:(CCC) (dilution factor) = (59.82 ug/l) (1.02) = 61.02 ug/l (dissolved)

Total recoverable limit = $61.02 \text{ ug/l} \div (0.997) = 61.20 \text{ ug/l}$

CMC = Acute nickel criteria (dissolved) = $\exp\{0.8460 [\ln(118)] + 2.255\} (0.998) = 538.61 \text{ ug/l}$

Maximum Daily Effluent limitation:(CMC) (dilution factor) = (538.61 ug/l) (1.02) = 549.39 ug/l (dissolved)

Total recoverable limit = $549.39 \text{ ug/l} \div (0.998) = 550.49 \text{ ug/l}$

Nickel is monitored as part of the chemical analysis in the facility's quarterly toxicity testing. A review of the data indicates that there is not a reasonable potential to cause or contribute to an exceedance in either

the chronic or acute in-stream criteria. Nickel data is shown below in Table 4. Effluent Chemistry Data from Whole Effluent Toxicity Tests. Therefore, no limit is required for this permit reissuance.

Cadmium

$CCC = \text{Chronic cadmium criteria (dissolved)} = \exp\{0.7409 [\ln(118)] - 4.72\} (0.902) = 0.28 \text{ ug/l}$

Average Monthly Effluent limitation: (CCC) (dilution factor) = (0.28 ug/l) (1.02) = 0.28 ug/l (dissolved)

Total recoverable limit = $0.28 \text{ ug/l} \div (0.902) = 0.31 \text{ ug/l}$

$CMC = \text{Acute cadmium criteria (dissolved)} = \exp\{1.0166 [\ln(118)] - 3.924\} (0.937) = 2.37 \text{ ug/l}$

Maximum Daily Effluent limitation: (CMC) (dilution factor) = (2.37 ug/l) (1.02) = 2.41 ug/l (dissolved)

Total recoverable limit = $2.41 \text{ ug/l} \div (0.937) = 2.57 \text{ ug/l}$

Cadmium is monitored as part of the chemical analysis in the facility's quarterly toxicity testing. A review of the data indicates that there is not a reasonable potential to cause or contribute to an exceedance in either the chronic or acute in-stream criteria. Cadmium data was non-detect in all toxicity tests that were reviewed as shown in Table 4. Effluent Chemistry Data from Whole Effluent Toxicity Tests. Therefore, no limit is required in this permit reissuance.

Zinc

$CCC = \text{Chronic zinc criteria (dissolved)} = \exp\{0.8473 [\ln(118)] + 0.884\} (0.986) = 135.92 \text{ ug/l}$

Average Monthly Effluent limitation:(CCC) (dilution factor) = (135.92 ug/l) (1.02) = 138.64 ug/l (dissolved)

Total recoverable limit = $138.64 \text{ ug/l} \div (0.986) = 140.61 \text{ ug/l}$

$CMC = \text{Acute zinc criteria (dissolved)} = \exp\{0.8473 [\ln(118)] + 0.884\} (0.978) = 134.82 \text{ ug/l}$

Maximum Daily Effluent limitation:(CMC) (dilution factor) = (134.82 ug/l) (1.02) = 137.52 ug/l (dissolved)

Total recoverable limit = $137.52 \text{ ug/l} \div (0.978) = 140.61 \text{ ug/l}$

Zinc is monitored as part of the chemical analysis in the facility's quarterly toxicity testing. The range of the concentration of zinc in the effluent was from 17 to 31 ug/l. Zinc data is shown in Table 4. Effluent Chemistry Data from Whole Effluent Toxicity Tests. There is not a reasonable potential to cause or contribute to an exceedance in either the chronic or acute in-stream criteria. Therefore, no limit is required for this permit reissuance.

Aluminum

The aluminum criteria is expressed in terms of total recoverable metal in the water column but is not hardness-dependent. The facility adds polyaluminum chloride (PAC) to the effluent for phosphorus removal. Between January 2007 through December 2009, the average monthly aluminum limit was exceeded 7 times.

$CCC = \text{Chronic aluminum criteria} = 87 \text{ ug/l}$

Average monthly effluent limitation: (CCC)(dilution factor) = (87 ug/l) (1.02) = 88.74 ug/l

CMC = Acute aluminum criteria = 750 ug/l

Maximum daily effluent limitation: (CMC)(dilution factor) = (750 ug/l) (1.02) = 765.00 ug/l

The effluent limits for aluminum in the draft permit are the same as the limits in the existing permit.

Table 4. Effluent Chemistry Data from Whole Effluent Toxicity Tests

	Lead	Nickel	Cadmium	Zinc	Aluminum
October 2009	non-detect	non-detect	non-detect	0.015 mg/l	0.07 mg/l
July 2009	non-detect	0.002 mg/l	non-detect	0.015 mg/l	0.07 mg/l
April 2009	non-detect	non-detect	non-detect	0.017 mg/l	0.12 mg/l
January 2009	non-detect	non-detect	non-detect	0.028 mg/l	0.06 mg/l
December 2008	0.0026 mg/l	non-detect	non-detect	0.013 mg/l	0.09 mg/l
October 2008	0.0005 mg/l	non-detect	non-detect	0.042 mg/l	0.20 mg/l
July 2008	non-detect	3.3 ug/l	non-detect	0.018 mg/l	0.10 mg/l
April 2008	non-detect	0.003 mg/l	non-detect	0.030 mg/l	0.054 mg/l
January 2008	0.66 ug/l	non-detect	non-detect	0.046 mg/l	non-detect

Ammonia

Ammonia can reduce the receiving stream dissolved oxygen concentration through nitrification and can be toxic at elevated levels. The effluent limitations for ammonia-nitrogen are year round and will remain the same as in the existing permit. The facility reported slight exceedances of the monthly average, weekly average and maximum daily ammonia limit in June 2007.

Phosphorus

Phosphorus is an essential nutrient for plant growth, but excessive amounts of phosphorus in a receiving water have the potential to accelerate stream eutrophication, characterized by excessive plant growth, low dissolved oxygen, and large diurnal swings in dissolved oxygen in the River.

The existing permit has a 0.2 mg/l monthly average limit for total phosphorus from April 1 through October 31 and a monthly reporting requirement for the remainder of the year, (November 1 through March 31). A review of DMR data from April 2007 through October 2009 showed no exceedances of the monthly average phosphorus concentration; the range was between 0.03 and 0.12 mg/l.

The impairments listed in “Massachusetts Year 2008 Lists of Integrative Waters”, for this segment of the River include dissolved oxygen saturation, excess algal growth organic enrichment biological indicators and total phosphorus. The “Charles River Basin 2002-2006 Water Quality Assessment Report”, published in April 2008 also documents nutrient enrichment of this segment, categorizing the status of designated uses for this segment of the river as impaired due to excess algal growth, elevated phosphorus,

and biological indicators of organic enrichment. A more detailed discussion on pages 11 through 14 of the report states that total phosphorus samples collected are elevated in this segment of the river (0.0621 mg/l to 0.260 mg/l), that there are poor sampling efficiencies for biological monitoring from a thick growth of aquatic macrophytes, and that the benthic community downstream of the facility appears to be structured in response to organic/nutrient enrichment.

The “Draft Total Maximum Daily Load (TMDL) for Nutrients in the Upper/Middle Charles River,” also known as the draft TMDL, was published in October 2009, and includes a phosphorus wasteload allocation for the Milford treatment plant. Section 3 of this report discusses nutrient enrichment as it pertains to this stretch of the river and provides data used in the formulation of the suggested wasteload allocation for the major POTWS. The design flow of any facility equal to or greater than 1 million gallon per day is considered a major facility. The design flow at the Milford facility is 4.3 MGD.

Section 7 of the draft TMDL recommends that reissued NPDES permits include total phosphorus limits of 0.1 mg/l. (April through October) and 0.3 mg/l for the remainder of the year for major POTWS in this stretch of the River. This supports the limits in the draft permit.

A more stringent limit than the one in the existing permit based on EPA’s Gold Book Criteria (*EPA 440/5/86-001*) was also calculated. The 1986 Quality Criteria of Water (commonly known as the “Gold Book”) follows an effects-based approach. It recommends maximum threshold concentrations designed to prevent or control adverse nutrient-related impacts from occurring. Specifically, the Gold Book recommends in-stream phosphorus concentrations of no greater than 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharging directly to lakes or impoundments, and 0.025 mg/l within the lake or reservoir.

The calculation, shown below, is for the months of April through October.

Calculation of Phosphorus Effluent Limits based on 1986 Quality Criteria for Water):

Total Phosphorus Limit from April through October

The total phosphorus effluent limit was calculated to assure that the in-stream total phosphorus concentration does not exceed 0.1 mg/l under 7Q10 low flow conditions with the treatment plant discharging at a flow of 4.3 MGD (6.65 cfs). A background concentration of 0.120 mg/l was assumed based on the maximum in-stream concentration collected at the sampling site, just upstream of the discharge. The calculation of the limit is shown below

$$Q_r C_r = Q_d C_d + Q_s C_s$$

Where

- Q_r = receiving water flow downstream of the discharge (Q_d + Q_s), 6.78 cfs
- C_r = total phosphorus concentration in the receiving water downstream of the discharge, 0.1 mg/l
- Q_d = discharge flow from the facility, 6.65 cfs
- C_d = total phosphorus concentration in the discharge
- Q_s = receiving water flow upstream of the discharge, 0.129 cfs
- C_s = maximum total phosphorus concentration upstream of the discharge, 0.120 mg/l (from draft TMDL river mile 4.8 see page 34)

Solving for C_d yields:

$$C_d = \frac{Q_r C_r - Q_s C_s}{Q_d}$$

$$C_d = \frac{(6.78)(0.1) - (0.129)(0.120)}{6.65}$$

$$C_d = 0.099 \text{ mg/l}$$

As can be seen, the calculated limit is essentially the same as the limit of 0.1 mg/l recommended in the draft TMDL. Accordingly a monthly average limit of 0.1 mg/l is included in the draft permit for the months of April through October. The monitoring frequency for this period is 3/week,

Total Phosphorus Limit for November through March

The primary concern with phosphorus stored in the bottom sediments of the river is that it may become available for algal and macrophyte growth during the summer growing season. Depending on water column conditions, sediment-bound phosphorus may be released to the water column. This is particularly true for impounded portions of the river that become stratified during the summer months and have low DO in the lower water column. Low DO at the sediment water interface promotes mobilization of phosphorus from the sediments to the water column. A limit of 0.3 mg/l from November 1 through March 31 is recommended in the draft TMDL. Attaining this limit will require removal of most of the particulate-bound phosphorus in the discharge, and should allow the dissolved portion to pass out of the system during the winter and spring when flows are higher and plant uptake is low.

Accordingly, a monthly average limit of 0.3 mg/l for the months of November through March is included in the draft permit. The monitoring frequency for this period 1/month.

Whole Effluent Toxicity Testing

Under Section 301(b)(1) of the CWA, discharges are subject to effluent limitations based on water quality standards. The State Surface Water Quality Standards (314 CMR 4.05(5)(e)), include the following narrative statements and require that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria:

All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife. Where the State determines that a specific pollutant not otherwise listed in 3.14 CMR 4.00 could reasonably be expected to adversely affect existing or designated uses, the State shall use the recommended limit published by EPA pursuant to 33 U.S.C. 1251 §304(a) as the allowable receiving water concentrations for the affected waters unless a site-specific limit is established. Site specific limits, human health risk levels and permit limits will be established in accordance with 314 CMR 4.05(5)(e)(1)(2)(3)(4).

National studies conducted by the EPA have demonstrated that industrial and domestic sources contribute toxic constituents, such as metals, chlorinated solvents aromatic hydrocarbons, and others to POTWs. The impact of such complex mixtures is often difficult to assess. Therefore, the toxicity of several constituents in a single effluent can only be accurately examined by whole effluent toxicity testing. In addition, 40 CFR 122.44 (d) requires whole effluent toxicity limits in NPDES permits when the permittee has a reasonable potential to cause toxicity.

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 analysis; (2) bioavailability of pollutants after discharge is measured by toxicity testing including any synergistic effect of pollutants; and (3) pollutants for which there are inadequate analytical methods or criteria can be addressed. Therefore, toxicity testing is being used in connection with pollutant-specific control procedures to control the discharge of toxic pollutants

Therefore, the draft permit includes modified acute and chronic whole effluent toxicity limitations and monitoring requirements (see below for details). (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/505-90-001). The LC50 limitation prohibits acute effects (lethality), to more than 50% of the test organisms when exposed to POTW undiluted effluent for 48 hours. The chronic-no observed effect concentration (C-NOEC) limitation in the draft permit prohibits chronic adverse effects (e.g., on survival growth, and reproduction) when aquatic organisms are exposed to the POTW discharges at the calculated available dilution

The LC50 limitation in the draft permit is 100%, consistent with MassDEP’s “Implementation Policy for the Control of Toxic Pollutants in Surface Waters”, February 23, 1990, which requires an effluent limitation of 1 toxic unit (LC 50 = 100%) for discharges with dilution factors less than 100.

The Chronic - No Observed Effect Concentration (C-NOEC) limitation in the draft permit prohibits chronic adverse effects (e.g., on survival, growth, or reproduction) when aquatic organisms are exposed to the POTW effluent at the available dilution. The C-NOEC is established equal to the receiving water concentration, (the inverse of the dilution factor) consistent with MassDEP’s “Implementation Policy for the Control of Toxic Pollutants in Surface Waters”, February 23, 1990.

$C\text{-NOEC} = 1/\text{dilution factor} = 1/1.02 = 0.980$ or 98%.

This draft permit continues to require four toxicity testing per year for the daphnid (*Ceriodaphnia dubia*). Tests are to be conducted in January, April, July and October using the protocol in Attachment A, Chronic Freshwater Toxicity Test Procedures and Protocols, of the draft permit.

The chronic and modified acute results of the October 2007 toxicity test failed to meet the permit limit of 100% for the chronic toxicity test. The results for all other toxicity tests between January 2007 and December 2009 met the permit limit of 100% for both the acute and chronic limits.

V. Sludge Information and Requirements

Sludge is no longer disposed in the on-site landfill. Sludge generated at the Milford WTP is transported by Synagro to Woonsocket, RI for incineration and final disposal. According to information on the facility’s recently submitted NPDES permit application, the total amount of sewage sludge from the facility disposed during the last year was 856 dry metric tons.

Section 405(d) of the CWA requires that sludge conditions be included in all municipal permits. The sludge conditions in the draft permit satisfy this requirement and are taken from EPA’s Standards for the Disposal of Sewage Sludge, found at 40 CFR Part 503.

VI. Pretreatment

Section 402(b)(8) of the CWA requires that POTWs receiving pollutants from significant industrial sources subject to section 307(b) standards establish a POTW pretreatment program to ensure compliance

with these standards. The implementing regulations at 40 CFR 403.8(a) state, “any POTW (or combination of POTWs operated by the same authority) with a total design flow greater than 5 million gallons per day (mgd) and receiving from industrial users pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards will be required to establish a POTW pretreatment program unless the NPDES State exercises its option to assume local responsibilities as provided in 403.10(e).” EPA or a NPDES State with an approved pretreatment program may require POTWs design flows of 5 mgd or less to develop a POTW pretreatment program if circumstances warrant (40 CFR 403.8(a)).

When the existing permit was issued in 2005, there was concern that the flow from the treatment plant would exceed 5 MGD and trigger the pretreatment requirements. Part 1.D of the current permit requires that an industrial pretreatment program be prepared within 270 days of notice by the Director. This pretreatment language has not been included in the draft permit because the facility does not treat pollutants from major industrial facilities nor has the treatment plant flow been greater than 5 MGD.

VII. Unauthorized Discharges

The permittee is only authorized to discharge wastewater from the wastewater treatment plant outfall (outfall 001). Other discharges of wastewater, such as pump station emergency overflows or sanitary sewer overflows must be reported in accordance with reporting requirements found in Section D.1.e of Part II of the permit (24-hour reporting), including both oral notice within 24 hours and written notice within 5 days..

VIII. Monitoring and Reporting

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

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

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

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

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

IX. State Certification Requirements

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving waters certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The staff of MassDEP has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

X. Public Comment Period, and Procedures for Final Decision

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to U.S.EPA, 5 Post Office Square-Suite 100, Mailcode OEP06-1, 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. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

XI. EPA and MA DEP 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:

Betsy Davis
US Environmental Protection Agency
5 Post Office Square – Suite 100
Mailcode: OEP06-1
Boston, Massachusetts 02109-3912
Telephone: (617) 918-1576

or

Kathleen Keohane
MA Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, MA 01608
Telephone: (508) 767-2856

Date

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

**Attachment A of the Fact Sheet
Milford Wastewater Treatment Plant
Summary of NPDES Permit Reporting Requirements Dates**

Permit Page	Requirement and Dates	Submit to:
5	Whole Effluent Toxicity Tests results are due February 28, May 31, August 31 and November 30.	EPA/MassDEP
8	The permittee shall develop and implement a plan to control I/I to the separate sewer system. The plan shall be submitted to EPA and MassDEP six months of the effective date of the permit. See Part 1.C.3.	MassDEP
8	A summary report of all actions taken to minimize I/I during the previous calendar year shall be submitted to EPA and the MassDEP annually by the permittee by the anniversary date of the effective date of the permit	EPA/MassDEP
10	The permittee shall submit an annual report containing the information specified in the sludge section of the permit by February 19.	EPA/MassDEP
11	Monitoring results obtained during the previous month shall be summarized for each month and reported on separate Discharge Monitoring Report Form(s) postmarked no later than the 15 th day of the month following the effective date of the permit.	EPA/MassDEP

RESPONSE TO PUBLIC COMMENTS

From July 9, 2010 to August 7, 2010, the United States Environmental Protection Agency Region 1 (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) solicited Public Comments on a draft NPDES permit for the Milford Wastewater Treatment Plant. The draft permit was developed pursuant to a reapplication from Mr. Richard Cenedella, Chairman of the Board of Sewer Commissioners in the Town of Milford, Massachusetts for reissuance of its NPDES permit to discharge treated wastewater to the Charles River. Upon considering the comments received, EPA has made a final decision to reissue the permit authorizing the discharge. The following response to comments briefly describes and responds to the comments and briefly describes the changes made to the permit. A copy of the final permit may be obtained from the permit writer, whose contact information is as follows:

Betsy Davis
United States Environmental Protection Agency
5 Post Office Square-Suite 100
Mailcode: OEP06-1
Boston, Massachusetts 02109-3912
Tel: (617) 918-1576.
Email: davis.betsy@epa.gov

Comments submitted by Kate Bowditch, Director of Projects, Charles River Watershed Association, dated August 9, 2010.

Comment #1: Phosphorus Limits

CRWA strongly supports the change in the permit to a limit of 0.1 mg/l in the summer months and 0.3 mg/l during the winter months. These phosphorus limits are in line with those established in the Draft Upper Charles River TMDL for nutrients. Limiting nutrients from treatment plant effluent remains a high priority if water quality standards are to be met, as was demonstrated in the Draft TMDL. Furthermore, the technology exists to meet these limits, and the Milford Wastewater Treatment Plant has generally been able to achieve phosphorus concentrations below those in this permit.

We do urge EPA to consider establishing an average weekly limit, rather than having solely an average monthly limit. With effluent limitations as low as these, there can be but little deviation in phosphorus concentrations so a weekly limit should not impose a burden on the permittee. In summer months, avoiding slugs of nutrient pollution is especially important and plant and algal responses can be extremely rapid. Therefore we suggest a weekly average be established at least for the summer months.

Response: EPA and MassDEP agree that limiting nutrients at the treatment plant is critical to attaining water quality standards for this segment of the Charles River. However, flows at POTWs are variable and the Agencies expect there will be instances when the concentration of phosphorus discharged to the river will fluctuate. Adding a weekly average phosphorus limit will not prevent this from happening.

The monthly average phosphorus limit in the final permit reflects those proposed in the “The Draft Total Maximum Daily Load (TMDL) for Nutrients in the Upper/Middle Charles River” published by MassDEP in September 2009. A stringent margin of safety to capture the worst case scenario from the wastewater treatment plants was incorporated into the water quality model used to calculate the recommended phosphorus limits in the draft TMDL. As explained in the draft

TMDL the impact from storm water runoff as well as point discharges must be addressed to meet water quality standards.

Comment #2: Total Suspended Solids

Given the already low levels of Total Suspended Solids (TSS) reported from the plant, and the significant impact of TSS on the benthic environment in the headwater area of the Charles, we suggest a lower TSS limit be established. A monthly average TSS of 10 mg/l for example seems to be easily achievable. Certainly the weekly average of 45 mg/l seems excessively high given ambient conditions in the Charles.

Response: The “Charles River Watershed 2002-2006 Water Quality Assessment Report” published in 2008 by the MassDEP lists aquatic life use as impaired for this segment of the Charles River. Page 13 of the report states the benthic community is somewhat unbalanced downstream of treatment plant’s discharge, but, states the apparent cause to be in response to organic/nutrient enrichment. The report also notes that Charles River Watershed Association collected 36 samples that were analyzed for TSS at this segment of the river and found TSS concentrations low; all were less than 16 mg/l.

EPA promulgated secondary treatment regulations for POTWs pursuant to 40 CFR Part 133 as a required in Section 301(b)(1)(B) of the Clean Water Act.

The TSS limits from May through October are based on a wasteload allocation from a Water Quality Management Plan for the Charles River that MassDEP published in 1976. The limits for the remainder of the year are based on secondary treatment standards pursuant to 40 CFR 133. MassDEP would require an updated wasteload allocation before reducing the TSS limits from November through April.

Comment #3: Escherichia Coli Bacteria (*E. coli*)

We support the proposed shift in the permit from fecal coliform to *E. coli* for establishing bacteria limits in the Permit. We suggest, however, that, following the Massachusetts water quality standards for a single sample maximum, the maximum daily limit for *E. coli* be 235 cfus/100 ml rather than the proposed 409 cfus/100 ml. Continued improvements in infrastructure, especially stronger Illicit Discharge Detection and Elimination (IDDE) programs, have lowered bacteria levels in the river making wastewater effluent levels a more significant component of bacterial loads. The state single sample standard should replace the 90th percentile of the monthly average geometric mean.

Response: Sample maximum criteria (SSMs) are intended for use concerning public health decisions and serves as a basis for the issuance of beach advisories and beach closures by the appropriate authorities, usually local boards of health. Exceedances of SSM, which trigger beach closures, in turn, may be used for assessment purposes in determining whether uses are being attained.

In the preamble of EPA’s final rule, **Water Quality Standards for Coastal and Great Lakes Recreation Waters**, published in the Federal Register on November 16, 2004 EPA explains the geometric mean is the more relevant value for ensuring that appropriate actions are taken to protect and improve water quality because it is a more reliable measure and less subject to random variation, and more directly linked to the underlying studies on which the 1986 bacteria criteria were based.

Draft bacteria guidance from MassDEP clarified when to use SSMs versus a geometric mean for purposes of State Water Quality Standards and the draft guidance specifies the geometric mean criteria be used in NPDES permits, for establishing TMDLs and for making water quality assessment determinations in connection with its 303(d) and 305(b) reporting requirements

Comment #4: Flow

We suggest the Final Permit should establish not only a maximum flow limit but also a minimum flow limit. Flows from the treatment plant are critical to maintaining ecosystem health, recreational opportunities and available dilution for other discharges. Flow limits should, at a minimum, mirror requirements in the MassDEP Sewer Extension Permit, which establishes minimum flow levels required in the river that must be maintained if the effluent is to be sold to International Power America's power plant for use as cooling water.

Response: Pursuant to 40 CFR 122.45(b)(1) permit limits for POTWs are calculated based on the design flow of the treatment plant. The design flow is typically calculated as an annual average, and is documented in the facilities plan when the treatment plant is designed. The monthly average flow limit is used to calculate mass limits for other parameters in the permit.

StreamflowStream flow issues in Massachusetts are being addressed by the Sustainable Water Management Resource Advisory Committee at the Massachusetts Executive Office of Energy and Environmental Affairs (EOEA). EPA and MassDEP are members of this advisory committee. This committee is charged with advising EOEA on the development of a water allocation program that looks at contributing causes and solutions to satisfying water needs while recognizing ecological issues such as low streamflowstream flow.